

**Vegetation Classification of Alliances and
Associations in San Mateo County, California
Appendix D
Vegetation Descriptions**

By

Kendra Sikes, Jennifer Buck-Diaz, and Julie M. Evens
California Native Plant Society, Vegetation Program
2707 K Street, Suite 1
Sacramento, CA 95816

A Report to:
Golden Gate National Parks Conservancy
2021



Contents

TREE OVERSTORY VEGETATION	1
Acer macrophyllum – Alnus rubra Forest & Woodland Alliance	1
Acer macrophyllum / (Rubus ursinus) Association	5
Acer macrophyllum – Pseudotsuga menziesii / Polystichum munitum Association	7
Alnus rubra / Rubus spectabilis – Sambucus racemosa Association	9
Alnus rubra / Salix lasiolepis – Rubus spp. Association	12
Umbellularia californica – Acer macrophyllum Association	14
Acer negundo Forest & Woodland Alliance	16
Acer negundo / (Rubus ursinus) Association	19
Aesculus californica Forest & Woodland Alliance	20
Aesculus californica – Umbellularia californica Association	24
Aesculus californica / Toxicodendron diversilobum / Moss Association	26
Alnus rhombifolia Forest & Woodland Alliance	28
Alnus rhombifolia / Carex (nudata) Association	31
Alnus rhombifolia – Umbellularia californica – (Quercus chrysolepis) Association	33
Arbutus menziesii Forest Alliance	35
Arbutus menziesii – (Quercus agrifolia) Association	38
Arbutus menziesii – Umbellularia californica Association	40
Eucalyptus spp. – Ailanthus altissima – Robinia pseudoacacia Woodland Semi-Natural Alliance	42
Acacia melanoxylon Provisional Semi-natural Association	45
Eucalyptus (globulus, camaldulensis) Provisional Semi-natural Association	47
Hesperocyparis (pigmaea, abramsiana, macrocarpa, goveniana) Woodland Alliance	49
Hesperocyparis abramsiana / Arctostaphylos (crustacea, silvicola) Provisional Association	52
Hesperocyparis macrocarpa – Pinus radiata Woodland Semi-Natural Alliance	53
Hesperocyparis macrocarpa Ruderal Provisional Semi-natural Association	56
Pinus radiata plantations Provisional Semi-natural Association	58
Notholithocarpus densiflorus Forest Alliance	60
Notholithocarpus densiflorus – Arbutus menziesii Association	63
Notholithocarpus densiflorus / Vaccinium ovatum Association	65
Pinus attenuata Forest & Woodland Alliance	67
Pinus attenuata / Arctostaphylos (crustacea) Provisional Association	70
Pinus muricata – Pinus radiata Forest & Woodland Alliance	72
Pinus radiata / Toxicodendron diversilobum Association	74
Platanus racemosa – Quercus agrifolia Woodland Alliance	75
Quercus agrifolia / Salix lasiolepis Association	78
Populus fremontii – Fraxinus velutina – Salix gooddingii Forest & Woodland Alliance	80
Populus fremontii / Baccharis salicifolia Association	82
Populus trichocarpa Forest & Woodland Alliance	83
Populus trichocarpa / Cornus sericea / Carex obnupta Provisional Association	86

Pseudotsuga menziesii – (Notholithocarpus densiflorus – Arbutus menziesii) Forest & Woodland Alliance	87
Pseudotsuga menziesii – (Umbellularia californica) / Frangula californica Association	90
Pseudotsuga menziesii – Arbutus menziesii Association	92
Pseudotsuga menziesii – Chrysolepis chrysophylla – Notholithocarpus densiflorus Association	94
Pseudotsuga menziesii – Notholithocarpus densiflorus / Vaccinium ovatum Association	96
Pseudotsuga menziesii – Quercus agrifolia Association	98
Pseudotsuga menziesii – Quercus chrysolepis Association	100
Pseudotsuga menziesii – Umbellularia californica / (Toxicodendron diversilobum) Association	102
Pseudotsuga menziesii – Umbellularia californica / Polystichum munitum Association	105
Pseudotsuga menziesii / (Toxicodendron diversilobum) Association	108
Pseudotsuga menziesii / Baccharis pilularis Association	110
Pseudotsuga menziesii / Corylus cornuta / Polystichum munitum Association	112
Quercus (agrifolia, douglasii, garryana, kelloggii, lobata, wislizeni) Forest & Woodland Alliance	114
Quercus douglasii – Quercus lobata – Quercus agrifolia / Toxicodendron diversilobum Association	117
Quercus agrifolia Forest & Woodland Alliance	118
Quercus agrifolia – Arbutus menziesii – Umbellularia californica Association	121
Quercus agrifolia – Arbutus menziesii / Corylus cornuta – Rubus spp. Association	124
Quercus agrifolia – Quercus kelloggii Association	126
Quercus agrifolia / Arctostaphylos (crustacea) Provisional Association	128
Quercus agrifolia / grass Association	130
Quercus agrifolia / Toxicodendron diversilobum Association	132
Quercus chrysolepis (tree) Forest & Woodland Alliance	134
Quercus chrysolepis – Umbellularia californica Association	138
Quercus chrysolepis / Quercus (wislizeni, parvula) Association	141
Quercus chrysolepis Association	144
Quercus douglasii Forest & Woodland Alliance	146
Quercus douglasii – Quercus agrifolia Association	150
Quercus douglasii / Mixed herbaceous Association	153
Quercus kelloggii Forest & Woodland Alliance	155
Quercus kelloggii – Arbutus menziesii – Quercus agrifolia Association	158
Quercus lobata Forest & Woodland Alliance	160
Quercus lobata / grass Association	163
Quercus wislizeni – Quercus parvula (tree) Forest & Woodland Alliance	166
Quercus (parvula, wislizeni) – Arbutus menziesii / Toxicodendron diversilobum Association	170
Salix gooddingii – Salix laevigata Forest & Woodland Alliance	173
Salix laevigata / (Cornus sericea – Ribes spp.) / Scirpus microcarpus – Carex spp. Association	177

Salix laevigata / Salix lasiolepis Association	179
Salix lucida ssp. lasiandra Forest & Woodland Alliance	182
Salix lucida ssp. lasiandra Association	184
Schinus (molle, terebinthifolius) – Myoporum laetum Woodland Semi-Natural Alliance	185
Sequoia sempervirens Forest & Woodland Alliance	188
Sequoia sempervirens – Acer macrophyllum – Umbellularia californica Association	191
Sequoia sempervirens – Arbutus menziesii / Vaccinium ovatum Association	194
Sequoia sempervirens – Chrysolepis chrysophylla / Arctostaphylos glandulosa Association	196
Sequoia sempervirens – Notholithocarpus densiflorus / Vaccinium ovatum Association	198
Sequoia sempervirens – Pseudotsuga menziesii – Notholithocarpus densiflorus Association	200
Sequoia sempervirens – Pseudotsuga menziesii – Umbellularia californica Association	202
Sequoia sempervirens – Umbellularia californica Association.....	204
Sequoia sempervirens / (Pteridium aquilinum) – Woodwardia fimbriata Association	206
Sequoia sempervirens / Polystichum munitum Association.....	209
Umbellularia californica Forest & Woodland Alliance	211
Umbellularia californica Association	214
Umbellularia californica – Quercus agrifolia / Toxicodendron diversilobum Association.....	216
Umbellularia californica / Polystichum munitum Association	218
SHRUB-OVERSTORY VEGETATION	220
Acacia spp. – Grevillea spp. – Leptospermum laevigatum Shrubland Provisional Semi-Natural Alliance	220
Acacia (cyclops, dealbata) Provisional Semi-natural Association	223
Adenostoma fasciculatum Shrubland Alliance	225
Adenostoma fasciculatum Association.....	228
Adenostoma fasciculatum – Diplacus aurantiacus Association	230
Arctostaphylos (crustacea, tomentosa) Shrubland Alliance	232
Arctostaphylos crustacea Association	235
Arctostaphylos crustacea – Adenostoma fasciculatum – Ceanothus (cuneatus, papillosus) Association	237
Arctostaphylos (nummularia, sensitiva) – Chrysolepis chrysophylla Shrubland Alliance	239
Arctostaphylos montaraensis – Arctostaphylos imbricata Provisional Association.....	242
Arctostaphylos sensitiva Association	244
Chrysolepis chrysophylla / Vaccinium ovatum Association	246
Artemisia californica – (Salvia leucophylla) Shrubland Alliance	248
Artemisia californica Association	251
Artemisia californica – Diplacus aurantiacus Association	253
Artemisia californica / Nassella (pulchra) Association	255
Baccharis pilularis Shrubland Alliance	257
Baccharis pilularis Association	261

Baccharis pilularis – (Frangula californica) – Rubus spp. Association	263
Baccharis pilularis – Artemisia californica Association	266
Baccharis pilularis – Ceanothus thyrsiflorus Association	268
Baccharis pilularis – Toxicodendron diversilobum Association	270
Baccharis pilularis / (Nassella pulchra – Elymus glaucus – Bromus carinatus) Association	272
Baccharis pilularis / Annual grass – herb Association	275
Baccharis pilularis / Carex obnupta – Juncus patens Provisional Association	278
Baccharis pilularis / Danthonia californica Association	281
Baccharis pilularis / Eriophyllum staechadifolium Association	284
Frangula californica ssp. californica – Baccharis pilularis / Scrophularia californica Association	287
Garrya elliptica Provisional Association	289
Ceanothus cuneatus Shrubland Alliance	291
Ceanothus cuneatus – Adenostoma fasciculatum Association	295
Ceanothus thyrsiflorus Shrubland Alliance	297
Ceanothus thyrsiflorus – (Rubus ursinus) Association	300
Ceanothus thyrsiflorus – Baccharis pilularis – Toxicodendron diversilobum Association	302
Cercocarpus montanus Shrubland Alliance	304
Cercocarpus montanus – Prunus ilicifolia Association	307
Cornus sericea Shrubland Alliance	308
Cornus sericea – Salix (lasiolepis, exigua) Association	310
Corylus cornuta var. californica Shrubland Alliance	311
Corylus cornuta / Polystichum munitum Association	313
Cytisus scoparius – Genista monspessulana – Cotoneaster spp. Shrubland Semi-Natural Alliance	314
Genista monspessulana Semi-natural Association	318
Hypericum canariense Provisional Semi-natural Association	320
Ulex europaeus Provisional Semi-natural Association	322
Diplacus aurantiacus Shrubland Alliance	324
Diplacus (aurantiacus, puniceus) Association	327
Frangula californica – Rhododendron occidentale – Salix breweri Shrubland Alliance	328
Gaultheria shallon – Rubus (ursinus) Shrubland Alliance	331
Holodiscus discolor – Baccharis pilularis – Rubus ursinus Association	334
Rubus parviflorus Association	336
Rubus ursinus Association	338
Lotus scoparius – Lupinus albifrons – Eriodictyon spp. Shrubland Alliance ...	340
Eriodictyon californicum / Herbaceous Association	343
Lotus scoparius Association	346
Lupinus arboreus Shrubland Alliance	348
Baccharis pilularis – Lupinus arboreus Association	352
Lupinus arboreus Association	354

Lupinus chamissonis – Ericameria ericoides Shrubland Alliance	357
Lupinus chamissonis Association	360
Lupinus chamissonis – Ericameria ericoides Association.....	362
Prunus ilicifolia – Heteromeles arbutifolia – Ceanothus spinosus Shrubland Alliance.....	364
Prunus ilicifolia ssp. Illicifolia – Heteromeles arbutifolia Association.....	367
Prunus ilicifolia ssp. Illicifolia / Sanicula crassicaulis Association	369
Quercus durata Shrubland Alliance.....	371
Quercus durata Association	374
Quercus durata – Adenostoma fasciculatum Provisional Association.....	376
Rubus spectabilis – Morella californica Shrubland Alliance.....	378
Morella californica – Rubus spp. Provisional Association	381
Sambucus racemosa – (Rubus ursinus) Provisional Association	383
Salix exigua Shrubland Alliance.....	385
Salix exigua Association.....	387
Salix hookeriana – Salix sitchensis – Spiraea douglasii Shrubland Alliance	388
Salix sitchensis Provisional Association.....	390
Salix lasiolepis Shrubland Alliance.....	391
Salix lasiolepis Association.....	394
Salix lasiolepis – Rubus spp. Association	396
Salix lasiolepis – Salix lucida Association	398
Toxicodendron diversilobum Shrubland Alliance	400
Toxicodendron diversilobum – (Baccharis pilularis) Association	402
HERBACEOUS VEGETATION	403
Abronia latifolia – Ambrosia chamissonis Herbaceous Alliance.....	403
Abronia latifolia – Calystegia soldanella – Lathyrus littoralis Association.....	406
Ambrosia chamissonis Association.....	408
Ammophila arenaria Herbaceous Semi-Natural Alliance	410
Ammophila arenaria Semi-natural Association	413
Atriplex prostrata – Cotula coronopifolia Herbaceous Semi-Natural Alliance .	415
Atriplex prostrata Semi-natural Association	417
Avena spp. – Bromus spp. Herbaceous Semi-Natural Alliance.....	418
Avena barbata – Avena fatua Semi-natural Association	422
Brachypodium distachyon Semi-natural Association.....	424
Bromus hordeaceus – Erodium botrys Semi-natural Association	426
Bidens cernua – Euthamia occidentalis – Ludwigia palustris Herbaceous Provisional Alliance	428
Euthamia occidentalis Provisional Association	431
Bolboschoenus maritimus Herbaceous Alliance.....	433
Bolboschoenus maritimus Association	436
Bolboschoenus maritimus – Sarcocornia pacifica Association	437
Brassica nigra – Centaurea (solstitialis, melitensis) Herbaceous Semi-Natural	

Alliance	439
<i>Carduus pycnocephalus</i> – <i>Silybum marianum</i> Provisional Semi-natural Association	443
<i>Centaurea solstitialis</i> Semi-natural Association.....	445
<i>Raphanus sativus</i> Semi-natural Association	447
Bromus carinatus – Elymus glaucus Herbaceous Alliance	449
<i>Bromus carinatus</i> Association	453
<i>Elymus glaucus</i> Association	456
<i>Pteridium aquilinum</i> – Grass Association.....	459
Cakile (edentula, maritima) Herbaceous Provisional Semi-Natural Alliance	461
<i>Cakile (edentula, maritima)</i> Provisional Semi-natural Association	463
Calamagrostis nutkaensis Herbaceous Alliance	464
<i>Calamagrostis nutkaensis</i> Association	468
<i>Calamagrostis nutkaensis</i> / <i>Baccharis pilularis</i> Association.....	471
Carex nudata Herbaceous Alliance	474
<i>Carex nudata</i> Association	476
Carex obnupta – Oenanthe sarmentosa – Scirpus microcarpus Herbaceous Alliance	477
<i>Argentina egedii</i> – (<i>Juncus lescurii</i>) Association	481
<i>Carex obnupta</i> Association.....	483
<i>Juncus lescurii</i> Association.....	485
<i>Scirpus microcarpus</i> Pacific Coast Association.....	488
Cortaderia (jubata, selloana) Herbaceous Semi-Natural Alliance	491
<i>Cortaderia (jubata, selloana)</i> Provisional Association	493
Deschampsia cespitosa – Hordeum brachyantherum – Danthonia californica Herbaceous Alliance	494
<i>Deschampsia (cespitosa, holciformis)</i> Association.....	498
<i>Deschampsia cespitosa</i> – <i>Danthonia californica</i> Association	501
<i>Deschampsia cespitosa</i> – <i>Eryngium armatum</i> Association	503
<i>Hordeum brachyantherum</i> Lowland Association	506
Distichlis spicata Herbaceous Alliance	508
<i>Distichlis spicata</i> – (<i>Sarcocornia pacifica</i>) Association	511
<i>Distichlis spicata</i> – <i>Frankenia salina</i> – <i>Jaumea carnosa</i> Association	513
Eichhornia crassipes – Ludwigia (hexapetala, peploides) Herbaceous Provisional Semi-Natural Alliance	515
<i>Ludwigia (hexapetala, peploides)</i> Provisional Semi-natural Association.....	517
Eleocharis (acicularis, macrostachya) Herbaceous Alliance	518
<i>Eleocharis macrostachya</i> Association	521
Eriophyllum staechadifolium – Erigeron glaucus – Eriogonum latifolium Herbaceous Alliance	523
<i>Artemisia pycnocephala</i> Association	527
<i>Erigeron glaucus</i> – <i>Fragaria chiloensis</i> Association	529
<i>Eriogonum parvifolium</i> Provisional Association.....	531
<i>Eriophyllum staechadifolium</i> – <i>Eriogonum latifolium</i> Association.....	533

Festuca idahoensis – Danthonia californica Herbaceous Alliance	535
Danthonia californica – Nassella pulchra Association	539
Danthonia californica Coastal Association	542
Festuca californica Association	545
Festuca idahoensis – (Danthonia californica – Koeleria macrantha) Association	547
Festuca idahoensis – Nassella pulchra Provisional Association.....	550
Perideridia kelloggii – Danthonia californica Provisional Association.....	553
Grindelia (stricta) Herbaceous Provisional Alliance.....	555
Grindelia stricta Provisional Association	557
Holcus lanatus – Anthoxanthum odoratum Herbaceous Semi-Natural Alliance	
.....	558
Holcus lanatus Semi-natural Association	561
Juncus (effusus, patens) – Carex (pansa, praegracilis) Herbaceous Alliance .	563
Carex serratodens Provisional Association.....	567
Juncus effusus Association	569
Juncus phaeocephalus Association.....	571
Lasthenia californica – Plantago erecta – Vulpia microstachys Herbaceous Alliance.....	574
Erigeron glaucus – Lasthenia californica Association.....	578
Hemizonia congesta – Lolium perenne Association	580
Lasthenia (californica, gracilis) Association	582
Lasthenia californica – Plantago erecta – Hesperevax sparsiflora Association.....	585
Vulpia microstachys – Plantago erecta – Calycadenia (truncata, multiglandulosa) Association	587
Lasthenia glaberrima Herbaceous Alliance.....	589
Lasthenia glaberrima – Pleuropogon californicus Association.....	591
Leymus cinereus – Leymus triticoides Herbaceous Alliance	592
Leymus triticoides Association	595
Leymus mollis Herbaceous Alliance.....	597
Leymus mollis – Abronia latifolia – (Cakile sp.) Association	599
Lolium perenne Herbaceous Semi-Natural Alliance	600
Lolium perenne Semi-natural Association.....	604
Lolium perenne – Lotus corniculatus Semi-natural Association.....	606
Mesembryanthemum spp. – Carpobrotus spp. Herbaceous Semi-Natural Alliance.....	609
Carpobrotus (edulis) Semi-natural Association	612
Mimulus (guttatus) Herbaceous Alliance.....	613
Cirsium fontinale Provisional Association	616
Mimulus guttatus Association	618
Nassella spp. – Melica spp. Herbaceous Alliance.....	620
Elymus multisetus – (Eschscholzia californica – Plantago erecta) Association.....	624
Melica californica Association.....	627
Nassella lepida Provisional Association.....	630

Nassella pulchra – Avena spp. – Bromus spp. Association	632
Nassella pulchra – Hemizonia congesta Association	635
Nassella pulchra – Lolium perenne – (Trifolium spp.) Association	637
Nassella pulchra – Lolium perenne – Plantago erecta Serpentine Association.....	640
Phalaris aquatica – Phalaris arundinacea Herbaceous Semi-Natural Alliance. 642	
Phalaris aquatica Provisional Semi-natural Association	645
Polygonum lapathifolium – Xanthium strumarium Herbaceous Alliance	647
Polygonum (amphibium, lapathifolium) Association	649
Sarcocornia pacifica (Salicornia depressa) Herbaceous Alliance.....	650
Frankenia salina – Limonium californicum – Monanthochloe littoralis – Sarcocornia pacifica Association	653
Sarcocornia pacifica – Jaumea carnosa – Distichlis spicata Association.....	655
Sarcocornia pacifica Tidal Association	657
Schoenoplectus (acutus, californicus) Herbaceous Alliance	659
Schoenoplectus acutus Association	662
Schoenoplectus californicus Association	664
Sedum spathulifolium Herbaceous Provisional Alliance.....	666
Sedum spathulifolium – Polypodium californicum / Lichen – Moss Provisional Association	668
Sparganium (angustifolium) Herbaceous Alliance	669
Sparganium eurycarpum Provisional Association	671
Typha (angustifolia, domingensis, latifolia) Herbaceous Alliance	672
Typha (latifolia, angustifolia) Association	674

TREE OVERSTORY VEGETATION

Acer macrophyllum – *Alnus rubra* Forest & Woodland Alliance



Common Name: Bigleaf maple – red alder forest and woodland

NVC Alliance Code: A3745. *Acer macrophyllum* - *Alnus rubra* Riparian Forest Alliance

Statewide Description

Acer macrophyllum and/or *Alnus rubra* is dominant or co-dominant in the tree canopy with *Abies concolor*, *Abies grandis*, *Alnus rhombifolia*, *Calocedrus decurrens*, *Cornus nuttallii*, *Picea sitchensis*, *Populus trichocarpa*, *Pseudotsuga menziesii*, *Quercus* spp., *Salix* spp., *Sequoia sempervirens*, *Taxus brevifolia*, *Tsuga heterophylla*, and *Umbellularia californica*.

This alliance occurs in habitats with different moisture regimes from moist stream terraces to dry talus, but it attains its best development on deep alluvial soils. Stands typically include a well-developed shrub understory of species such as *Rubus spectabilis*, *R. ursinus*, and *Sambucus racemosa* (Cheng 2004, Keeler-Wolf et al. 2003a, Evens and Kentner 2006). Stands of *Alnus rubra* were much more restricted in the past, occurring chiefly along streams or natural landslides; today seedlings and stands easily establish in upland areas that have been recently logged (Sawyer 2006). The best developed stands are scattered along alluvial river terraces, in adjacent side drainages, and at springs along slopes. *Acer macrophyllum* is extremely flood tolerant; it

Acer macrophyllum – *Alnus rubra* Forest & Woodland Alliance

is the only hardwood encountered commonly in low elevation in Pacific Northwest coniferous forests in both steep upland slopes and riparian habitats. At the southern portion of its range, in southern and central California, it is usually riparian (Minore and Zasada 1990, Uchytel 1989a).

We are including three different environmental settings in this alliance at this time. Stands surrounded by coastal forests in northwestern or central California contain a scattering of tall conifers, such as *Picea sitchensis*, *Pseudotsuga menziesii*, or *Sequoia sempervirens* (Sawyer 2006). Stands in the mountains, which are scattered, typically contain *Pseudotsuga menziesii* as a co-dominant. Other California authors (Chambers 2003, Fites 1993, Jimerson et al. 1996) have placed their mixed associations in the *Pseudotsuga menziesii* or other conifer alliances; however, we place them in the *Acer macrophyllum* – *Alnus rubra* alliance, because this riparian species is a primary indicator and co-dominant in these associations. Stands on talus and other upland settings are the third environmental setting. We have combined two previously separate alliances, the *Acer macrophyllum* and *Alnus rubra* alliances as recognized in the 2009 book, *A Manual of California Vegetation, second edition*.

Local Vegetation Description

The Bigleaf maple – red alder forest and woodland Alliance forms an open to continuous tree canopy with an open to intermittent shrub understory. The dominant tree is *Alnus rubra*, and *Acer macrophyllum* are characteristic or often present. Commonly associated shrubs include *Rubus ursinus*, *Toxicodendron diversilobum*, and *Sambucus racemosa*, and commonly associated herbs include *Polystichum munitum*, *Athyrium filix-femina*, *Stachys bullata*, and *Urtica dioica*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	1.3	0 – 8	30.0	15 – 50
Hardwood	58.6	27 – 75	16.9	10 – 35
Regenerating or Shrubby Tree	2.3	0 – 13.6	8.8	0.5 – 20
Shrub	20.0	3.0 – 65.0	2.4	0 – 5
Herb	25.2	0.2 – 87.5	1.0	0 – 5

Local Membership Rule

Acer macrophyllum dominates or co-dominates with *Umbellularia californica* in riparian stands, OR *Umbellularia californica* is dominant in riparian stands with *Acer macrophyllum* or *Pseudotsuga menziesii* characteristically present. An understory of riparian shrubs such as *Rhododendron occidentale* are sometimes present.

Alnus rubra dominates in the tree canopy in riparian settings, typically within a few miles of the coast. The understory is often comprised of one to many species of *Rubus*, *Salix lasiolepis*, and *Sambucus racemosa*, which sometimes exceed *Alnus* in cover. If *Salix lucida* is co-dominant, key to that *Salix* alliance. *Alnus rubra* stands were encountered in riparian or swampy bottomlands but can also occur along rocky streambeds in similar settings to *A. rhombifolia* stands. Careful identification of the *Alnus* species is important closer to the coast.

Local Environmental Description

Elevation: Mean 138 m, Range 15 – 564 m

Aspect: Variable (3), Flat (2), NW (1), SW (1), NE (1)

Slope: Mean 20 degrees, Range 0 – 60 degrees

Macro Topography: Bottom to Lower 1/3 of slope (3), Bottom (2), Lower 1/3 of slope (1), Lower to Middle 1/3 of slope (1), Not recorded (1)

Large Rock: Mean 0.4%, Range 0.0 – 1.2%

Small Rock: Mean 2.0%, Range 0.0 – 4.0%

Fines Cover: Mean 18.2%, Range 0.0 – 51.6%

Litter Cover: Mean 69.2%, Range 40.0 – 95%

Soil Texture (field assessed): Coarse, loamy sand (2), Medium to very fine, sandy loam (2), Not recorded (1), Unknown (1), Moderately coarse, sandy loam (1), Medium loam (1)

Geology (field or map data): Sandstone, shale, and conglomerate (3), Mixed metamorphic (2), Sandstone (2), Sandy alluvium (most alluvial fans and washes) (1), Sandstone and other sedimentary (1), Mixed sedimentary (1), Alluvium (1), Shale and other sedimentary (1)

San Mateo County Watersheds: Ano Nuevo (4), Half Moon Bay (3), Tunitas Creek (2), Palo Alto (1), Pescadero Creek (1), San Mateo Bayside (1)

Site Impacts

This alliance has low non-native plant cover (average 5.5%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Conium maculatum* and *Myosotis latifolia*.

Associations in San Mateo County

- *Acer macrophyllum* / (*Rubus ursinus*)
- *Acer macrophyllum* – *Pseudotsuga menziesii* / *Polystichum munitum* *Alnus rubra* / *Rubus spectabilis* – *Sambucus racemosa*
- *Alnus rubra* / *Salix lasiolepis* – *Rubus* spp.
- *Umbellularia californica* – *Acer macrophyllum*

Classification Comments

This alliance has been redefined from previously separate *Acer macrophyllum* and *Alnus rubra* Alliances. The USNVC is also evaluating a broader merging of alliances including this alliance along with lower elevation stands of other riparian trees such as *Fraxinus latifolia*. Further updates to alliance concepts will be found online at the USNVC (2020).

References: AECOM 2013, Jimerson 1993, Jimerson et al. 1996, Keeler-Wolf et al. 2003a, Klein et al. 2007, Klein et al. 2015

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Acer macrophyllum – *Alnus rubra* Forest & Woodland Alliance

Total: N=12; San Mateo County (n=12): PGA1015, PGA779, PWALD02A, SMAT0025, SMAT0055, SMAT0056, SMAT0085, SMAT0203, SMAT0325, SMAT0326, SMATR0649, TOKA034A

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Alnus rubra</i>	83.3	55.9	25.2	5	75	Y	Y		Y
	<i>Acer macrophyllum</i>	58.3	19.3	11.9	0.2	45				Y
	<i>Umbellularia californica</i>	41.7	9.1	6.1	0.2	30				
	<i>Pseudotsuga menziesii</i>	33.3	2.2	0.9	0.2	8				
Regenerating or Shrubby Trees	<i>Alnus rubra</i>	33.3	17.2	1.1	1	5.2				
Shrub	<i>Rubus ursinus</i>	83.3	28.6	12.4	0.2	45	Y			Y
	<i>Toxicodendron diversilobum</i>	75.0	9.7	2.3	0.2	5	Y			Y
	<i>Sambucus racemosa</i>	66.7	11.6	3.7	0.4	30				Y
	<i>Salix lasiolepis</i>	41.7	11.6	4.9	1	26				
	<i>Rubus parviflorus</i>	41.7	9.7	1.4	0.2	8				
Herb	<i>Polystichum munitum</i>	83.3	13.2	3.7	0.2	25	Y			Y
	<i>Urtica dioica</i>	58.3	20.5	4.3	1	25				Y
	<i>Athyrium filix-femina</i>	58.3	13.4	2.2	0.2	10				Y
	<i>Stachys bullata</i>	50.0	2.6	0.3	0.2	2				Y
	<i>Myosotis latifolia</i>	41.7	0.8	0.1	0.2	0.2				
	<i>Scrophularia californica</i>	41.7	1.0	0.1	0.2	0.2				
	<i>Equisetum telmateia</i>	33.3	3.0	0.4	0.2	2				
	<i>Dryopteris arguta</i>	33.3	2.7	0.2	0.2	2				
	<i>Scirpus microcarpus</i>	33.3	1.8	0.2	0.2	1				
	<i>Cardamine californica</i>	33.3	0.5	0.1	0.2	0.2				
	<i>Galium aparine</i>	33.3	0.8	0.1	0.2	0.2				
	<i>Heracleum maximum</i>	25.0	3.1	2.1	0.2	25				
	<i>Elymus californicus</i>	25.0	0.8	0.4	0.2	3				
	<i>Tellima grandiflora</i>	25.0	1.0	0.2	0.2	1				
	<i>Conium maculatum</i>	25.0	0.8	0.1	0.2	1				
	<i>Galium spp.</i>	25.0	0.1	0.1	0.2	0.2				
<i>Marah fabaceus</i>	25.0	0.8	0.1	0.2	0.2					

Non-Vascular	<i>Rumex spp.</i>	25.0	0.2	0.1	0.2	0.2
	Moss	33.3	18.1	0.1	0.2	0.4
	Lichen	25.0	12.5	0.1	0.2	0.2

***Acer macrophyllum* / (*Rubus ursinus*) Association**

Common Name: Bigleaf Maple / (California blackberry) Woodland

Alliance: *Acer macrophyllum* – *Alnus rubra* Forest & Woodland Alliance

Local Vegetation Description

The Bigleaf Maple / (California blackberry) Association forms an open to continuous tree canopy with an open shrub understory. The dominant tree is *Acer macrophyllum*, and *Umbellularia californica* and *Pseudotsuga menziesii* are characteristic or often present. Commonly associated shrubs include *Toxicodendron diversilobum*, *Rubus ursinus*, and *Symphoricarpos mollis*, and commonly associated herbs include *Iris douglasiana*, *Osmorhiza berteroi*, *Polystichum munitum*, *Sanicula crassicaulis*, and *Stachys ajugoides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	2.2	0 – 7	22.5	5 – 50
Hardwood	54.3	30 – 65	15.8	5 – 35
Regenerating or Shrubby Tree	0.7	0 – 2.4	3.5	2 – 5
Shrub	6.7	1.0 – 20.0	1.6	0.5 – 5
Herb	15.8	2 – 40	0.3	0 – 1

Local Environmental Description

Elevation: Mean 217 m, Range 60 – 629 m

Aspect: NE (2), NW (2), SW (1), Variable (1)

Slope: Mean 30 degrees, Range 4 – 65 degrees

Macro Topography: Lower 1/3 of slope (2), Bottom (1), Bottom to Lower 1/3 of slope (1), Middle 1/3 of slope (1), Upper 1/3 of slope (1)

Large Rock: Mean 4.6%, Range 0.2 – 15.0%

Small Rock: Mean 6.1%, Range 0.4 – 20.0%

Fines Cover: Mean 6.2%, Range 1.0 – 20.0%

Litter Cover: Mean 68.2%, Range 4.0 – 95%

Soil Texture (field assessed): Coarse, loamy sand (2), Moderately coarse, sandy loam (2), Moderately fine clay loam (1), Moderately fine silty clay loam (1)

Geology (field or map data): Franciscan melange (3), Sandstone and other sedimentary (1), Sedimentary (type unknown) (1), Sandstone (1)

San Mateo County Watersheds: Ano Nuevo (1), Palo Alto (1)

Other Watersheds, Marin Co.: Lagunitas Creek (2), Novato (1), San Rafael (1);

Site Impacts

This association has low non-native plant cover (average 1.6%) relative to native

cover. Non-native species that occur with highest frequency and abundance include *Briza maxima*, *Carduus pycnocephalus*, *Galium aparine*, and *Rubus armeniacus*.

Classification Comments

The name of this association was previously *Acer macrophyllum* Association, which has been updated to match the NVC. Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: AECOM 2013, Klein et al. 2007, Klein et al. 2015

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=6; San Mateo County (n=2): SMAT0285, SMAT0326

Marin County (n=4): MMWD0157, MMWD0182, MOSD0064, MOSD0172

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Acer macrophyllum</i>	100.0	57.5	31.8	20	55	Y	Y		Y
	<i>Umbellularia californica</i>	83.3	20.2	11.0	3	19	Y			Y
	<i>Pseudotsuga menziesii</i>	50.0	2.6	1.7	1	7				Y
	<i>Quercus chrysolepis</i>	33.3	5.2	3.4	0.2	20				Y
	<i>Sequoia sempervirens</i>	33.3	1.1	0.7	2	2				Y
	<i>Quercus agrifolia</i>	33.3	0.5	0.3	1	1				
	<i>Arbutus menziesii</i>	33.3	0.4	0.2	0.2	1				
Regenerating or Shrubby Trees	<i>Acer macrophyllum</i>	33.3	10.7	0.1	0.2	0.2				
	<i>Notholithocarpus densiflorus</i>	33.3	9.7	0.1	0.2	0.2				
	<i>Pseudotsuga menziesii</i>	33.3	3.8	0.1	0.2	0.2				
Shrub	<i>Toxicodendron diversilobum</i>	100.0	37.3	0.7	0.2	1	Y		Y	Y
	<i>Rubus ursinus</i>	50.0	20.1	2.9	0.2	15				Y
	<i>Symphoricarpos mollis</i>	50.0	5.8	0.1	0.2	0.2				Y
	<i>Holodiscus discolor</i>	33.3	14.6	1.7	0.2	10				
	<i>Corylus cornuta</i>	33.3	4.4	0.1	0.2	0.2				
	<i>Lonicera hispidula</i>	33.3	4.4	0.1	0.2	0.2				
		<i>Acer macrophyllum</i> / (<i>Rubus ursinus</i>) Association <i>Acer macrophyllum</i> – <i>Alnus rubra</i> Woodland Alliance								

Herb

<i>Iris douglasiana</i>	83.3	7.8	0.8	0.2	2	Y
<i>Polystichum munitum</i>	66.7	13.3	1.2	0.2	5	Y
<i>Stachys ajugoides</i>	50.0	8.7	0.5	0.2	2	Y
<i>Osmorhiza berteroi</i>	50.0	4.8	0.2	0.2	1	Y
<i>Sanicula crassicaulis</i>	50.0	2.7	0.1	0.2	0.2	Y
<i>Athyrium filix-femina</i>	33.3	5.7	0.7	0.2	4	
<i>Bromus carinatus</i>	33.3	4.1	0.4	0.2	2	
<i>Juncus patens</i>	33.3	1.4	0.2	0.2	1	
<i>Cardamine californica</i>	33.3	1.3	0.1	0.2	0.2	
<i>Galium aparine</i>	33.3	0.7	0.1	0.2	0.2	
<i>Galium porrigens</i>	33.3	0.6	0.1	0.2	0.2	
<i>Nemophila parviflora</i>	33.3	0.6	0.1	0.2	0.2	

Non-Vascular

Moss	50.0	40.2	1.2	0.2	5	Y
Lichen	33.3	9.8	0.1	0.2	0.2	

***Acer macrophyllum* – *Pseudotsuga menziesii* / *Polystichum munitum* Association**

Common Name: Douglas-fir - Bigleaf Maple / Sword Fern Woodland

Alliance: *Acer macrophyllum* – *Alnus rubra* Forest & Woodland Alliance

Local Vegetation Description

The Douglas-fir - Bigleaf Maple / Sword Fern Association forms an open tree canopy with an intermittent shrub understory in the single sample available. The co-dominant trees are *Acer macrophyllum* and *Notholithocarpus densiflorus*, and *Pseudotsuga menziesii* is characteristic. Commonly associated shrubs include *Holodiscus discolor*, *Rubus ursinus*, *Lonicera hispidula*, and *Toxicodendron diversilobum* and commonly associated herbs include *Urtica dioica*, *Polystichum munitum*, and *Pteridium aquilinum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	8.0	NA	42.5	35 – 50
Hardwood	27.0	NA	no data	no data
Regenerating or Shrubby Tree	0.0	NA	no data	no data
Shrub	65.0	NA	no data	no data
Herb	4.0	NA	3.5	2 – 5

Local Environmental Description

Elevation: 564 m

Aspect: no data

Slope: no data

Macro Topography: no data

Large Rock: no data

Small Rock: no data

Fines Cover: no data

Litter Cover: no data

Soil Texture (field assessed): no data

Geology (field or map data): Shale and other sedimentary (1)

San Mateo County Watersheds: San Mateo Bayside (1)

Site Impacts

This association has very low non-native plant cover (average 0.0%) relative to native cover. No non-natives were recorded by the surveyor.

Classification Comments

The NVC includes *Umbellularia californica* in their analogous association which is placed in the upland *Pseudotsuga menziesii* - *Notholithocarpus densiflorus* alliance, which we are not including in the study area.

Acer macrophyllum – *Pseudotsuga menziesii* / *Polystichum munitum* Association
Acer macrophyllum – *Alnus rubra* Woodland Alliance

References: Jimerson et al. 1996

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=1; San Mateo County (n=1): PGA779

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Notholithocarpus densiflorus</i>	100.0	42.9	15.0	15	15	Y		Y	Y
	<i>Acer macrophyllum</i>	100.0	34.3	12.0	12	12	Y		Y	Y
	<i>Pseudotsuga menziesii</i>	100.0	22.9	8.0	8	8	Y			Y
Shrub	<i>Rubus ursinus</i>	100.0	50.0	45.0	45	45	Y	Y		Y
	<i>Holodiscus discolor</i>	100.0	38.9	35.0	35	35	Y		Y	Y
	<i>Lonicera hispidula</i>	100.0	5.6	5.0	5	5	Y			Y
	<i>Toxicodendron diversilobum</i>	100.0	5.6	5.0	5	5	Y			Y
Herb	<i>Urtica dioica</i>	100.0	71.4	25.0	25	25	Y	Y		Y
	<i>Polystichum munitum</i>	100.0	14.3	5.0	5	5	Y			Y
	<i>Pteridium aquilinum</i>	100.0	14.3	5.0	5	5	Y			Y

Acer macrophyllum – *Pseudotsuga menziesii* / *Polystichum munitum* Association
Acer macrophyllum – *Alnus rubra* Woodland Alliance

Alnus rubra / Rubus spectabilis – Sambucus racemosa Association

Common Name: Red Alder / Salmonberry – Blue Elderberry Woodland

Alliance: *Acer macrophyllum* – *Alnus rubra* Forest & Woodland Alliance

Local Vegetation Description

The Red Alder / Salmonberry – Blue Elderberry Association forms an intermittent to continuous tree canopy with an open shrub understory. The dominant tree is *Alnus rubra*. Commonly associated shrubs include *Sambucus racemosa*, *Rubus ursinus*, *Rubus parviflorus*, and *Rubus spectabilis*, and commonly associated herbs include *Polystichum munitum*, *Stachys ajugoides*, and *Urtica dioica*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	65.8	60 – 75	15.0	10 – 3520
Regenerating or Shrubby Tree	1.7	0 – 5.2	10.0	5 – 15
Shrub	14.3	3.0 – 30.0	3.5	2 – 5
Herb	54.2	0.2 – 87.5	1.1	0.5 – 2

Local Environmental Description

Elevation: Mean 129 m, Range 15 – 202 m

Aspect: SW (1)

Slope: Mean 24 degrees, Range 24 – 24 degrees

Macro Topography: Lower to Middle 1/3 of slope (1)

Large Rock: Mean 1.1%, Range 1.0 – 1.2%

Small Rock: Mean 3.0%, Range 2.0 – 4.0%

Fines Cover: Mean 8.0%, Range 6.0 – 10.0%

Litter Cover: Mean 65.0%, Range 50.0 – 80%

Soil Texture (field assessed): Moderately coarse, sandy loam (1)

Geology (field or map data): Sandstone, shale, and conglomerate (2), Sandy alluvium (most alluvial fans and washes) (1)

San Mateo County Watersheds: Half Moon Bay (2), Ano Nuevo (1)

Site Impacts

This association has low non-native plant cover (average 2.9%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Conium maculatum* and *Holcus lanatus*.

Classification Comments

None.

Acer macrophyllum – *Pseudotsuga menziesii* / *Polystichum munitum* Association
Acer macrophyllum – *Alnus rubra* Woodland Alliance

References: Keeler-Wolf et al. 2003a

Global Rarity Rank: G3G4

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=3; San Mateo County (n=3): PGA1015, PWALD02A, SMAT0203

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Alnus rubra</i>	100.0	80.0	49.2	35	75		Y		Y
	<i>Acer macrophyllum</i>	66.7	9.6	6.7	0.2	20				Y
	<i>Umbellularia californica</i>	66.7	9.5	6.0	3	15				Y
	<i>Notholithocarpus densiflorus</i>	33.3	0.5	0.3	1	1				
	<i>Aesculus californica</i>	33.3	0.4	0.3	1	1				
	Regenerating or Shrubby Trees	<i>Alnus rubra</i>	33.3	33.3	1.7	5.2	5.2			
Shrub	<i>Sambucus racemosa</i>	100.0	31.5	11.7	2	30			Y	Y
	<i>Rubus ursinus</i>	66.7	11.4	5.1	0.2	15				Y
	<i>Toxicodendron diversilobum</i>	66.7	6.7	1.7	0.2	5				Y
	<i>Rubus armeniacus</i>	33.3	24.2	3.3	10	10				
	<i>Frangula californica</i>	33.3	12.3	3.3	10	10				
	<i>Corylus cornuta</i>	33.3	12.3	3.3	10	10				
	<i>Salix lasiolepis</i>	33.3	0.7	0.3	1	1				
	<i>Ribes divaricatum</i>	33.3	0.5	0.1	0.2	0.2				
	<i>Rubus parviflorus</i>	33.3	0.5	0.1	0.2	0.2				
Herb	<i>Urtica dioica</i>	100.0	18.2	3.7	3	5				Y
	<i>Polystichum munitum</i>	100.0	14.4	9.4	0.2	25				Y
	<i>Athyrium filix-femina</i>	66.7	14.5	4.0	2	10				Y
	<i>Heracleum maximum</i>	66.7	12.0	8.4	0.2	25				Y
	<i>Elymus californicus</i>	66.7	1.5	1.1	0.2	3				Y
	<i>Galium aparine</i>	66.7	1.1	0.1	0.2	0.2				Y
	<i>Carex bolanderi</i>	33.3	18.8	12.5	37.5	37.5				
	<i>Viola pedunculata</i>	33.3	2.4	1.7	5	5				

Acer macrophyllum – *Pseudotsuga menziesii* / *Polystichum munitum* Association
Acer macrophyllum – *Alnus rubra* Woodland Alliance

<i>Dicentra formosa</i>	33.3	1.5	1.0	3	3
<i>Pteridium aquilinum</i>	33.3	1.5	1.0	3	3
<i>Stachys chamissonis</i>	33.3	1.5	1.0	3	3
<i>Iris spp.</i>	33.3	1.4	1.0	3	3
<i>Carex spp.</i>	33.3	1.4	1.0	3	3
<i>Marah fabaceus</i>	33.3	1.0	0.1	0.2	0.2
<i>Conium maculatum</i>	33.3	1.0	0.1	0.2	0.2
<i>Dryopteris arguta</i>	33.3	1.0	0.1	0.2	0.2
<i>Sanicula crassicaulis</i>	33.3	1.0	0.1	0.2	0.2
<i>Scrophularia californica</i>	33.3	1.0	0.1	0.2	0.2
<i>Ehrharta erecta</i>	33.3	1.0	0.1	0.2	0.2
<i>Stachys bullata</i>	33.3	1.0	0.1	0.2	0.2
<i>Polypodium californicum</i>	33.3	1.0	0.1	0.2	0.2
<i>Carex tumulicola</i>	33.3	0.1	0.1	0.2	0.2
<i>Galium triflorum</i>	33.3	0.1	0.1	0.2	0.2
<i>Epilobium spp.</i>	33.3	0.1	0.1	0.2	0.2
<i>Equisetum telmateia</i>	33.3	0.1	0.1	0.2	0.2
<i>Cicuta douglasii</i>	33.3	0.1	0.1	0.2	0.2
<i>Actaea rubra</i>	33.3	0.1	0.1	0.2	0.2
<i>Viola spp.</i>	33.3	0.1	0.1	0.2	0.2
<i>Cyperus eragrostis</i>	33.3	0.1	0.1	0.2	0.2
<i>Tellima grandiflora</i>	33.3	0.1	0.1	0.2	0.2
<i>Marah oreganus</i>	33.3	0.1	0.1	0.2	0.2
<i>Solanum spp.</i>	33.3	0.1	0.1	0.2	0.2
<i>Rorippa spp.</i>	33.3	0.1	0.1	0.2	0.2
<i>Osmorhiza berteroi</i>	33.3	0.1	0.1	0.2	0.2
<i>Myosotis sylvatica</i>	33.3	0.1	0.1	0.2	0.2
<i>Maianthemum stellatum</i>	33.3	0.1	0.1	0.2	0.2
<i>Polypodium spp.</i>	33.3	0.1	0.1	0.2	0.2
<i>Trillium ovatum</i>	33.3	0.1	0.1	0.2	0.2
<i>Cardamine californica</i>	33.3	0.1	0.1	0.2	0.2
<i>Myosotis latifolia</i>	33.3	0.1	0.1	0.2	0.2
<i>Stachys ajugoides</i>	33.3	0.1	0.1	0.2	0.2
<i>Galium spp.</i>	33.3	0.1	0.1	0.2	0.2
<i>Phacelia spp.</i>	33.3	0.1	0.1	0.2	0.2
Non-Vascular					
Moss	33.3	16.7	0.1	0.2	0.2
Lichen	33.3	16.7	0.1	0.2	0.2

***Alnus rubra* / *Salix lasiolepis* – *Rubus* spp. Association**

Common Name: Red Alder / Arroyo Willow – Berry Brambles Woodland

Alliance: *Acer macrophyllum* – *Alnus rubra* Forest & Woodland Alliance

Local Vegetation Description

The Red Alder / Arroyo Willow – Berry Brambles Association forms an open to intermittent tree canopy with an open shrub understory. The dominant tree is *Alnus rubra*. Commonly associated shrubs include *Rubus ursinus*, *Sambucus racemosa*, *Salix lasiolepis*, and *Toxicodendron diversilobum*, and commonly associated herbs include *Athyrium filix-femina*, *Polystichum munitum*, *Rumex* spp., *Scrophularia californica*, *Stachys bullata*, and *Urtica dioica*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.1	0 – 0.2	17.5	15 – 20
Hardwood	57.0	40 – 75	14.2	10 – 20
Regenerating or Shrubby Tree	1.7	0 – 64	4.1	0.5 – 10
Shrub	18.3	5.0 – 30.0	1.5	0 – 5
Herb	5.0	3 – 7	0.4	0 – 1

Local Environmental Description

Elevation: Mean 55 m, Range 16 – 97 m

Aspect: Flat (2), NE (1), Variable (1)

Slope: Mean 21 degrees, Range 0 – 60 degrees

Macro Topography: Bottom to Lower 1/3 of slope (2), Not recorded (1), Bottom (1)

Large Rock: Mean 0.4%, Range 0.0 – 1.0%

Small Rock: Mean 1.6%, Range 0.0 – 2.2%

Fines Cover: Mean 34.2%, Range 10.0 – 51.6%

Litter Cover: Mean 57.1%, Range 40.0 – 80%

Soil Texture (field assessed): Coarse, loamy sand (1), Medium loam (1),

Geology (field or map data): Alluvium (1), Sandstone, shale, and conglomerate (1), Sandstone and other sedimentary (1), Sandstone (1), Mixed sedimentary (1)

San Mateo County Watersheds: Ano Nuevo (2), Tunitas Creek (2), Pescadero Creek (1)

Site Impacts

This association has low non-native plant cover (average 11.3%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Bromus diandrus*, *Carduus pycnocephalus*, *Conium maculatum*, *Geranium dissectum*, *Medicago* spp., and *Phalaris aquatica*.

Classification Comments

Alnus rubra / *Salix lasiolepis* – *Rubus* spp. Association
Acer macrophyllum – *Alnus rubra* Woodland Alliance

Previously there were 2 separate associations recognized, an *Alnus rubra* / *Salix lasiolepis* on Point Reyes (Keeler-Wolf et al. 2003a) and an *Alnus rubra* / *Rubus* spp. from Sonoma County (Klein et al. 2015). These have been lumped into a single association, due to overlapping species composition..

References: Jimerson 1993, Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: G4

State Rarity Rank: S3

State Rare: Y

Surveys Used for Description

Total: N=5; San Mateo County (n=5): SMAT0055, SMAT0056, SMAT0325, SMATR0649, TOKA034A

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Alnus rubra</i>	100.0	77.5	24.0	5	55			Y	Y
	<i>Populus trichocarpa</i>	40.0	20.0	7.0	15	20				
Regenerating or Shrubby Trees	<i>Populus trichocarpa</i>	40.0	26.2	1.2	1	5.2				
	<i>Alnus rubra</i>	40.0	13.8	0.4	1	1.2				
Shrub	<i>Rubus ursinus</i>	80.0	28.5	12.6	8	20				Y
	<i>Sambucus racemosa</i>	80.0	3.3	0.9	0.4	2				Y
	<i>Salix lasiolepis</i>	60.0	21.9	9.4	1	26				Y
	<i>Toxicodendron diversilobum</i>	60.0	9.0	2.2	3	5				Y
	<i>Rubus parviflorus</i>	40.0	14.9	2.4	4	8				
	<i>Oemleria cerasiformis</i>	40.0	0.2	0.1	0.2	0.2				
Herb	<i>Urtica dioica</i>	60.0	24.0	3.2	1	10				Y
	<i>Athyrium filix-femina</i>	60.0	6.6	0.4	0.2	1				Y
	<i>Stachys bullata</i>	60.0	4.8	0.6	0.2	2				Y
	<i>Polystichum munitum</i>	60.0	3.5	0.5	0.2	2				Y
	<i>Scrophularia californica</i>	60.0	1.4	0.1	0.2	0.2				Y
	<i>Rumex</i> spp.	60.0	0.5	0.1	0.2	0.2				Y
	<i>Bromus diandrus</i>	40.0	6.7	1.0	0.2	5				
	<i>Carduus pycnocephalus</i>	40.0	2.5	0.4	1	1				
<i>Alnus rubra</i> / <i>Salix lasiolepis</i> – <i>Rubus</i> spp. Association <i>Acer macrophyllum</i> – <i>Alnus rubra</i> Woodland Alliance										

	<i>Geranium dissectum</i>	40.0	2.3	2.2	0.2	10.843
	<i>Galium porrigens</i>	40.0	1.6	0.2	0.2	1
	<i>Scirpus microcarpus</i>	40.0	1.3	0.1	0.2	0.2
	<i>Veronica americana</i>	40.0	1.3	0.1	0.2	0.2
	<i>Marah fabaceus</i>	40.0	1.3	0.1	0.2	0.2
	<i>Myosotis latifolia</i>	40.0	1.3	0.1	0.2	0.2
	<i>Claytonia sibirica</i>	40.0	1.3	0.1	0.2	0.2
	<i>Conium maculatum</i>	40.0	1.2	0.2	0.2	1
	<i>Medicago spp.</i>	40.0	1.0	0.8	0.2	3.6145
	<i>Equisetum arvense</i>	40.0	0.3	0.1	0.2	0.2
	<i>Cirsium vulgare</i>	40.0	0.3	0.1	0.2	0.2
	<i>Galium spp.</i>	40.0	0.3	0.1	0.2	0.2
	<i>Stachys spp.</i>	40.0	0.3	0.1	0.2	0.2
Non-Vascular						
	Moss	40.0	23.3	0.1	0.2	0.4

***Umbellularia californica* – *Acer macrophyllum* Association**

Common Name: California Bay – Bigleaf Maple Woodland

Alliance: *Acer macrophyllum* – *Alnus rubra* Forest & Woodland Alliance

Local Vegetation Description

The California Bay – Bigleaf Maple Association forms an intermittent to continuous tree canopy with an open shrub understory. The co-dominant trees are *Umbellularia californica* and *Acer macrophyllum*, and *Alnus rubra* and *Pseudotsuga menziesii* are often present. Commonly associated shrubs include *Toxicodendron diversilobum*, *Corylus cornuta*, and *Rubus ursinus*, and commonly associated herbs include *Polystichum munitum*, *Equisetum telmateia*, *Dryopteris arguta*, *Cardamine californica*, and *Stachys bullata*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	1.0	0 – 2	42.5	35 – 50
Hardwood	67.5	60 – 75	22.5	15 – 35
Regenerating or Shrubby Tree	6.8	0 – 13.6	15.0	10 – 20
Shrub	16.5	3.0 – 30.0	1.5	1 – 2
Herb	11.0	2 – 20	0.5	0 – 1

Local Environmental Description

Elevation: Mean 186 m, Range 169 – 203 m

Aspect: NW (1), Variable (1)

Slope: Mean 16 degrees, Range 11 – 20 degrees

Macro Topography: Bottom (1), Lower 1/3 of slope (1)

Large Rock: Mean 0.1%, Range 0.0 – 0.2%

Small Rock: Mean 1.2%, Range 0.4 – 2.0%

Fines Cover: Mean 2.5%, Range 0.0 – 5.0%

Litter Cover: Mean 90.0%, Range 85.0 – 95%

Soil Texture (field assessed): Medium to very fine, sandy loam (2)

Geology (field or map data): Mixed metamorphic (2)

San Mateo County Watersheds: Half Moon Bay (1), Palo Alto (1)

Site Impacts

This association has very low non-native plant cover (average 0.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Hedera helix* and *Myosotis latifolia*.

Classification Comments

This association was previously placed in the *Umbellularia californica* Alliance, but has
Umbellularia californica – *Acer macrophyllum* Association
Acer macrophyllum – *Alnus rubra* Woodland Alliance

been moved here with other riparian associations.

References: Evens and Kentner 2006, Klein et al. 2015

Global Rarity Rank: G3

State Rarity Rank: S3?

State Rare: Y

Surveys Used for Description

Total: N=2; San Mateo County (n=2): SMAT0025, SMAT0085

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Acer macrophyllum</i>	100.0	45.6	32.5	25	40			Y	Y
	<i>Umbellularia californica</i>	100.0	40.5	27.5	25	30			Y	Y
	<i>Alnus rubra</i>	50.0	12.9	12.5	25	25				Y
	<i>Pseudotsuga menziesii</i>	50.0	1.0	1.0	2	2				Y
Regenerating or Shrubby Trees	<i>Acer macrophyllum</i>	50.0	19.1	2.6	5.2	5.2				Y
	<i>Alnus rubra</i>	50.0	19.1	2.6	5.2	5.2				Y
	<i>Umbellularia californica</i>	50.0	11.8	1.6	3.2	3.2				Y
Shrub	<i>Rubus ursinus</i>	100.0	35.6	11.5	3	20			Y	Y
	<i>Toxicodendron diversilobum</i>	100.0	11.3	2.5	2	3				Y
	<i>Sambucus racemosa</i>	50.0	14.4	2.5	5	5				Y
	<i>Salix lasiolepis</i>	50.0	13.5	5.0	10	10				Y
	<i>Rubus parviflorus</i>	50.0	8.6	1.5	3	3				Y
	<i>Corylus cornuta</i>	50.0	8.6	1.5	3	3				Y
	<i>Symphoricarpos albus</i>	50.0	6.8	2.5	5	5				Y
	<i>Hedera helix</i>	50.0	0.6	0.1	0.2	0.2				Y
	<i>Ceanothus thyrsiflorus</i>	50.0	0.6	0.1	0.2	0.2				Y
Herb	<i>Polystichum munitum</i>	100.0	22.1	1.6	0.2	3				Y
	<i>Dryopteris arguta</i>	100.0	14.9	1.1	0.2	2				Y
	<i>Equisetum telmateia</i>	100.0	13.7	1.5	1	2				Y

Umbellularia californica – *Acer macrophyllum* Association
Acer macrophyllum – *Alnus rubra* Woodland Alliance

<i>Stachys bullata</i>	100.0	2.1	0.2	0.2	0.2	Y
<i>Cardamine californica</i>	100.0	2.1	0.2	0.2	0.2	Y
<i>Athyrium filix-femina</i>	50.0	26.1	4.0	8	8	Y
<i>Scirpus microcarpus</i>	50.0	3.3	0.5	1	1	Y
<i>Tellima grandiflora</i>	50.0	3.3	0.5	1	1	Y
<i>Carex obnupta</i>	50.0	3.3	0.5	1	1	Y
<i>Maianthemum stellatum</i>	50.0	1.4	0.1	0.2	0.2	Y
<i>Scrophularia californica</i>	50.0	1.4	0.1	0.2	0.2	Y
<i>Trillium chloropetalum</i>	50.0	1.4	0.1	0.2	0.2	Y
<i>Polypodium calirhiza</i>	50.0	0.7	0.1	0.2	0.2	Y
<i>Osmorhiza berteroi</i>	50.0	0.7	0.1	0.2	0.2	Y
<i>Maianthemum spp.</i>	50.0	0.7	0.1	0.2	0.2	Y
<i>Viola sempervirens</i>	50.0	0.7	0.1	0.2	0.2	Y
<i>Prosartes hookeri</i>	50.0	0.7	0.1	0.2	0.2	Y
<i>Myosotis latifolia</i>	50.0	0.7	0.1	0.2	0.2	Y
<i>Heracleum maximum</i>	50.0	0.7	0.1	0.2	0.2	Y
<i>Aquilegia formosa</i>	50.0	0.4	0.1	0.11	0.11	Y

***Acer negundo* Forest & Woodland Alliance**



Common Name: Box-elder forest and woodland

NVC Alliance Code: A3796. *Acer negundo* - *Fraxinus anomala* - *Celtis laevigata* var. *reticulata* Riparian Woodland Alliance

Statewide Description

Acer negundo is dominant or co-dominant in the tree canopy with *Alnus rhombifolia*, *Fraxinus latifolia*, *Juglans hindsii*, *Juglans hindsii* × *regia*, *Platanus racemosa*, *Populus fremontii*, *Populus trichocarpa*, *Quercus lobata*, *Salix gooddingii*, and *Salix* spp.

In California, this alliance is mainly limited to riparian zones of major streams and rivers that are regularly flooded. Individual trees often occur as an understory component in stands of *Populus fremontii*, *Quercus lobata*, and *Salix gooddingii* Alliances. *Acer negundo* stands may result from removal of the overstory trees in stands of those alliances. The *Acer negundo* Alliance is rare in the state, where small stands form and sometimes are monospecific.

Local Vegetation Description

The Box-elder forest and woodland Alliance forms an intermittent to continuous tree canopy with an open to intermittent shrub understory. The dominant tree is *Acer negundo*, and *Alnus rubra* and *Umbellularia californica* are characteristic or often present. Regenerating or shrubby trees that are often present include *Acer negundo* and *Alnus rubra*. Commonly associated shrubs include *Rubus ursinus*, *Sambucus*
Acer negundo Woodland Alliance

racemosa, and *Salix lasiolepis*, and commonly associated herbs include *Dryopteris arguta*, *Marah fabaceus*, *Stachys bullata*, *Urtica dioica*, *Delairea odorata*, *Equisetum telmateia*, *Myosotis latifolia*, *Polystichum munitum*, *Scrophularia californica*, and *Vinca major*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	78.3	63 – 90	8.8	5 – 15
Regenerating or Shrubby Tree	4.1	0 – 13.4	3.5	2 – 5
Shrub	27.1	13.0 – 40.0	2.1	0.5 – 5
Herb	12.3	0.2 – 46	0.6	0 – 1

Local Membership Rule

Acer negundo dominates in the tree overstory, often along major streams and rivers, with other riparian plants such as *Fraxinus*, *Populus*, *Rubus*, and *Salix*. Stands are considered rare in the state and may be small and monospecific.

Local Environmental Description

Elevation: Mean 30 m, Range 14 – 52 m

Aspect: Variable (1), NE (1), NW (1), SW (1)

Slope: Mean 15 degrees, Range 5 – 28 degrees

Macro Topography: Lower to Middle 1/3 of slope (2), Bottom (1), Lower 1/3 of slope (1)

Large Rock: Mean 0.0%, Range 0.0 – 0.0%

Small Rock: Mean 0.0%, Range 0.0 – 0.0%

Fines Cover: Mean 11.3%, Range 0.0 – 38.0%

Litter Cover: Mean 86.3%, Range 60.0 – 97%

Soil Texture (field assessed): Not recorded (2), Moderately coarse, sandy loam (1), Fine silty clay (1)

Geology (field or map data): Mixed alluvium (2), Sandstone and other sedimentary (1), Sandy alluvium (most alluvial fans and washes) (1)

San Mateo County Watersheds: Pescadero Creek (3), Ano Nuevo (1)

Site Impacts

This alliance has low non-native plant cover (average 4.7%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Conium maculatum*, *Delairea odorata*, *Ehrharta erecta*, *Myosotis latifolia*, and *Vinca major*.

Associations in San Mateo County

- *Acer negundo* / (*Rubus ursinus*)

Classification Comments

None.

References: Buck-Diaz et al. 2012

Global Rarity Rank: G5

State Rarity Rank: S2

Surveys Used for Description

Total: N=4; San Mateo County (n=4): SMAT0102, SMAT0182, SMAT0205, SMAT0298

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Acer negundo</i>	100.0	96.9	76.3	60	90	Y	Y		Y
	<i>Alnus rubra</i>	50.0	1.9	1.5	1	5				Y
	<i>Umbellularia californica</i>	50.0	1.3	0.8	0.2	3				Y
Regenerating or Shrubby Trees	<i>Acer negundo</i>	50.0	40.2	3.3	2.2	11				Y
	<i>Alnus rubra</i>	50.0	5.9	0.6	0.2	2.2				Y
	<i>Acer macrophyllum</i>	25.0	3.6	0.1	0.4	0.4				
	<i>Salix lasiandra</i>	25.0	0.4	0.1	0.2	0.2				
Shrub	<i>Rubus ursinus</i>	100.0	70.0	18.8	10	35	Y	Y		Y
	<i>Sambucus racemosa</i>	75.0	11.9	3.8	2	10	Y			Y
	<i>Salix lasiolepis</i>	50.0	8.1	2.8	1	10				Y
	<i>Ribes spp.</i>	25.0	8.2	1.3	5	5				
	<i>Rubus parviflorus</i>	25.0	1.3	0.5	2	2				
	<i>Cornus sericea</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Frangula californica</i>	25.0	0.3	0.1	0.2	0.2				
Herb	<i>Urtica dioica</i>	100.0	9.3	1.9	0.2	5	Y			Y
	<i>Marah fabaceus</i>	75.0	23.6	7.8	1	25	Y			Y
	<i>Stachys bullata</i>	75.0	10.8	1.4	0.2	5	Y			Y
	<i>Dryopteris arguta</i>	75.0	4.5	0.4	0.2	1	Y			Y
	<i>Delairea odorata</i>	50.0	21.0	5.8	8	15				Y
	<i>Polystichum munitum</i>	50.0	6.1	0.8	1.2	2				Y
	<i>Vinca major</i>	50.0	0.9	0.3	0.2	1				Y
	<i>Myosotis latifolia</i>	50.0	10.8	0.3	0.2	1				Y

	<i>Scrophularia californica</i>	50.0	0.5	0.1	0.2	0.2			Y
	<i>Equisetum telmateia</i>	50.0	0.4	0.1	0.2	0.2			Y
	<i>Forb (herbaceous, not grass nor grasslike)</i>	25.0	2.1	0.1	0.2	0.2			
	<i>Polypodium californicum</i>	25.0	0.4	0.1	0.2	0.2			
	<i>Polypodium spp.</i>	25.0	2.1	0.1	0.2	0.2			
	<i>Ehrharta erecta</i>	25.0	0.3	0.1	0.2	0.2			
	<i>Pteridium aquilinum</i>	25.0	0.4	0.1	0.2	0.2			
	<i>Dicentra formosa</i>	25.0	0.4	0.1	0.2	0.2			
	<i>Conium maculatum</i>	25.0	2.1	0.1	0.2	0.2			
	<i>Triteleia spp.</i>	25.0	2.1	0.1	0.2	0.2			
	<i>unknown Apiaceae</i>	25.0	2.1	0.1	0.2	0.2			
Non-Vascular									
	Moss	100.0	93.3	4.3	1	8	Y	Y	Y
	Lichen	75.0	6.7	0.2	0.2	0.2	Y		Y

***Acer negundo* / (*Rubus ursinus*) Association**

Common Name: Box-elder / (California blackberry) Woodland

Alliance: *Acer negundo* Forest & Woodland Alliance

Classification Comments

The name of this association has been updated from the *Acer negundo* Association to reflect the important understory component. The association circumscription is the same as that of the alliance for the county. See above for detailed description.

References: Buck-Diaz et al. 2012

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Acer macrophyllum</i>	100.0	57.5	31.8	20	55	Y	Y		Y
	<i>Umbellularia californica</i>	83.3	20.2	11.0	3	19	Y			Y
	<i>Pseudotsuga menziesii</i>	50.0	2.6	1.7	1	7				Y
	<i>Quercus chrysolepis</i>	33.3	5.2	3.4	0.2	20				
	<i>Sequoia sempervirens</i>	33.3	1.1	0.7	2	2				
	<i>Quercus agrifolia</i>	33.3	0.5	0.3	1	1				
	<i>Arbutus menziesii</i>	33.3	0.4	0.2	0.2	1				
Regenerating or Shrubby Trees	<i>Acer macrophyllum</i>	33.3	10.7	0.1	0.2	0.2				
	<i>Notholithocarpus densiflorus</i>	33.3	9.7	0.1	0.2	0.2				
	<i>Pseudotsuga menziesii</i>	33.3	3.8	0.1	0.2	0.2				
Shrub	<i>Toxicodendron diversilobum</i>	100.0	37.3	0.7	0.2	1	Y		Y	Y
	<i>Rubus ursinus</i>	50.0	20.1	2.9	0.2	15				Y
	<i>Symphoricarpos mollis</i>	50.0	5.8	0.1	0.2	0.2				Y
	<i>Holodiscus discolor</i>	33.3	14.6	1.7	0.2	10				
	<i>Corylus cornuta</i>	33.3	4.4	0.1	0.2	0.2				
	<i>Lonicera hispidula</i>	33.3	4.4	0.1	0.2	0.2				
Herb	<i>Iris douglasiana</i>	83.3	7.8	0.8	0.2	2				Y

Acer negundo Woodland Alliance

	<i>Polystichum munitum</i>	66.7	13.3	1.2	0.2	5	Y
	<i>Stachys ajugoides</i>	50.0	8.7	0.5	0.2	2	Y
	<i>Osmorhiza berteroi</i>	50.0	4.8	0.2	0.2	1	Y
	<i>Sanicula crassicaulis</i>	50.0	2.7	0.1	0.2	0.2	Y
	<i>Athyrium filix-femina</i>	33.3	5.7	0.7	0.2	4	
	<i>Bromus carinatus</i>	33.3	4.1	0.4	0.2	2	
	<i>Juncus patens</i>	33.3	1.4	0.2	0.2	1	
	<i>Cardamine californica</i>	33.3	1.3	0.1	0.2	0.2	
	<i>Galium aparine</i>	33.3	0.7	0.1	0.2	0.2	
	<i>Galium porrigens</i>	33.3	0.6	0.1	0.2	0.2	
	<i>Nemophila parviflora</i>	33.3	0.6	0.1	0.2	0.2	
Non-Vascular							
	Moss	50.0	40.2	1.2	0.2	5	Y
	Lichen	33.3	9.8	0.1	0.2	0.2	

***Aesculus californica* Forest & Woodland Alliance**



Common Name: California buckeye groves

NVC Alliance Code: A4125. *Aesculus californica* Woodland Alliance

Statewide Description

Aesculus californica is dominant or co-dominant in the tree canopy with *Fraxinus dipetala*, *Heteromeles arbutifolia*, *Pinus sabiniana*, *Prunus ilicifolia*, *Quercus wislizeni*, and *Umbellularia californica*.

Stands tend to be small and often occur in relatively mesic concavities inland or on steep lower to mid slopes in coastal areas. They intermix with stands of many chaparral and woodland alliances at low elevations.

Local Vegetation Description

The California buckeye groves Alliance forms an intermittent to continuous tree canopy with an open to intermittent shrub understory. The dominant tree is *Aesculus californica*, and *Quercus agrifolia* and *Umbellularia californica* are characteristic or often present. Commonly associated shrubs include *Toxicodendron diversilobum* and *Rubus ursinus*, and commonly associated herbs include *Claytonia perfoliata*, *Dryopteris arguta*, *Heracleum maximum*, and *Marah fabaceus*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
----------	-----------	-----------	------------	------------

	Mean	Range	Mean	Range
Conifer	0.7	0 – 5	27.5	20 – 35
Hardwood	59.4	35 – 90	10.5	5 – 15
Regenerating or Shrubby Tree	1.9	0 – 10	3.5	2 – 5
Shrub	25.7	3 – 60	2.6	1 – 5
Herb	29.3	2 – 90	0.5	0 – 2

Local Membership Rule

Aesculus californica dominates in open to moderately dense woodlands. If *Umbellularia californica* is present, it is sub-dominant. A variety of herbs may be found in the understory.

Local Environmental Description

Elevation: Mean 183 m, Range 23 – 508 m

Aspect: NW (2), SE (2), NE (1), Variable (1)

Slope: Mean 20 degrees, Range 4 – 35 degrees

Macro Topography: Lower 1/3 of slope (3), Wash (channel bed) (1), Middle to Upper 1/3 of slope (1), Upper 1/3 of slope (1)

Large Rock: Mean 0.0%, Range 0.0 – 0.2%

Small Rock: Mean 0.2%, Range 0.0 – 1.2%

Fines Cover: Mean 11.4%, Range 3.0 – 19.0%

Litter Cover: Mean 72.5%, Range 10.0 – 96%

Soil Texture (field assessed): Not recorded (1), Coarse, loamy sand (1), Medium to very fine, loamy sand (1), Medium to very fine, sandy loam (1), Moderately coarse, sandy loam (1), Moderately fine clay loam (1)

Geology (field or map data): Franciscan melange (4), Volcanic flow rocks (2), Greenstone (1), Sandy alluvium (most alluvial fans and washes) (1), Shale and other sedimentary (1)

San Mateo County Watersheds: San Mateo Bayside (5), Palo Alto (2), Ano Nuevo (1), San Gregorio Creek (1)

Site Impacts

This alliance has low non-native plant cover (average 3.8%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Carduus pycnocephalus*, *Conium maculatum*, and *Myosotis latifolia*.

Associations in San Mateo County

- *Aesculus californica* – *Umbellularia californica*
- *Aesculus californica* / *Toxicodendron diversilobum* / Moss

Classification Comments

None.

References: Buck-Diaz et al. 2012, Evens and Kentner 2006, Evens et al. 2004, Kittel et al. 2012, Klein et al. 2007, Klein et al. 2015

Global Rarity Rank: G3

State Rarity Rank: S3

Surveys Used for Description

Total: N=10; San Mateo County (n=10): GGNRA323, PGA1824, PGA758, PGA761, PGA764, SMAT0061, SMAT0097, SMAT0112, SMAT0204, SMAT0251

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Aesculus californica</i>	100.0	81.7	51.0	20	80	Y	Y		Y
	<i>Quercus agrifolia</i>	80.0	7.3	4.5	1	20	Y			Y
	<i>Umbellularia californica</i>	70.0	9.5	4.4	0.2	15				Y
	<i>Pseudotsuga menziesii</i>	20.0	0.8	0.6	1	5				
Regenerating or Shrubby Trees	<i>Aesculus californica</i>	40.0	21.8	0.5	0.4	2				
	<i>Quercus agrifolia</i>	20.0	8.2	0.1	0.4	1				
	<i>Umbellularia californica</i>	20.0	4.0	0.1	0.2	1				
Shrub	<i>Toxicodendron diversilobum</i>	100.0	48.7	14.6	3	25	Y		Y	Y
	<i>Rubus ursinus</i>	70.0	22.4	11.1	1	40				Y
	<i>Frangula californica</i>	40.0	7.2	2.6	1	10				

	<i>Baccharis pilularis</i>	40.0	2.5	0.2	0.2	1	
	<i>Sambucus nigra</i>	30.0	2.2	1.0	0.2	10	
	<i>Symphoricarpos albus</i>	30.0	0.8	0.3	0.2	3	
	<i>Rubus parviflorus</i>	20.0	2.2	1.0	0.2	10	
	<i>Prunus ilicifolia</i>	20.0	2.0	0.9	2	7	
	<i>Rhamnus crocea</i>	20.0	1.1	0.5	0.2	5	
	<i>Symphoricarpos mollis</i>	20.0	1.1	0.3	0.2	3	
	<i>Ribes spp.</i>	20.0	0.4	0.1	0.2	1	
	<i>Sambucus racemosa</i>	20.0	0.5	0.0	0.2	0.2	
	<i>Lonicera hispidula</i>	20.0	0.1	0.0	0.2	0.2	
Herb							
	<i>Dryopteris arguta</i>	60.0	16.9	1.5	0.2	10	Y
	<i>Marah fabaceus</i>	60.0	0.8	0.3	0.2	2	Y
	<i>Heracleum maximum</i>	50.0	11.1	6.0	0.2	20	Y
	<i>Claytonia perfoliata</i>	50.0	5.4	3.1	0.2	25	Y
	<i>Pteridium aquilinum</i>	40.0	6.9	1.8	0.2	15	
	<i>Stachys ajugoides</i>	40.0	4.8	1.2	0.2	7	
	<i>Sanicula crassicaulis</i>	40.0	1.6	0.6	0.2	5	
	<i>Conium maculatum</i>	30.0	8.5	5.2	2	30	
	<i>Urtica dioica</i>	30.0	4.8	2.6	0.2	25	
	<i>Polystichum munitum</i>	30.0	9.9	1.1	0.2	10	
	<i>Galium aparine</i>	30.0	0.4	0.1	0.2	0.2	
	<i>Maianthemum spp.</i>	30.0	0.5	0.1	0.2	0.2	
	<i>Iris douglasiana</i>	30.0	0.3	0.1	0.2	0.2	
	<i>Thalictrum fendleri</i>	20.0	4.0	3.0	0.2	30	
	<i>unknown Poaceae</i>	20.0	2.5	0.5	0.2	5	
	<i>Trillium chloropetalum</i>	20.0	0.4	0.0	0.2	0.2	
	<i>Scrophularia californica</i>	20.0	0.1	0.0	0.2	0.2	
	<i>Myosotis latifolia</i>	20.0	0.4	0.0	0.2	0.2	
	<i>Galium porrigens</i>	20.0	1.0	0.0	0.2	0.2	
	<i>Clinopodium douglasii</i>	20.0	0.9	0.0	0.2	0.2	
	<i>Chlorogalum pomeridianum</i>	20.0	0.9	0.0	0.2	0.2	
	<i>Carduus pycnocephalus</i>	20.0	0.8	0.0	0.2	0.2	
	<i>Aquilegia formosa</i>	20.0	0.1	0.0	0.2	0.2	
	<i>Adiantum jordanii</i>	20.0	1.0	0.0	0.2	0.2	
	<i>Pentagramma triangularis</i>	20.0	0.8	0.0	0.2	0.2	
Non-Vascular							
	Moss	30.0	20.1	1.3	0.2	10	
	Lichen	30.0	9.9	0.3	0.2	2	

***Aesculus californica* – *Umbellularia californica* Association**

Common Name: California Buckeye – California Bay Woodland

Alliance: *Aesculus californica* Forest & Woodland Alliance

Local Vegetation Description

The California Buckeye – California Bay / Association forms an intermittent to continuous tree canopy with an open to intermittent shrub understory. The dominant tree is *Aesculus californica*, and *Quercus agrifolia* and *Umbellularia californica* are characteristically present. Commonly associated shrubs include *Toxicodendron diversilobum*, and commonly associated herbs include *Stachys ajugoides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	55.0	35 – 90	no data	no data
Regenerating or Shrubby Tree	3.3	0 – 10	no data	no data
Shrub	38.3	5 – 60	2.6	2 – 5
Herb	58.3	20 – 90	0.5	0 – 0.5

Local Environmental Description

Elevation: Mean 115 m, Range 93 – 158 m **Aspect:** no data

Slope: no data

Macro Topography: no data

Large Rock: No data

Small Rock: No data

Fines Cover: No data

Litter Cover: No data

Soil Texture (field assessed): no data

Geology (field or map data): Franciscan melange (3)

San Mateo County Watersheds: San Mateo Bayside (3)

Site Impacts

This association has very low non-native plant cover (average 0.6%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Avena* spp., *Briza maxima*, and *Carduus pycnocephalus*.

Classification Comments

This association is a merge of two previously defined associations which share similar understories, *Aesculus californica* – *Umbellularia californica* / *Diplacus aurantiacus* and *Aesculus californica* – *Umbellularia californica* / *Holodiscus discolor*.

References: Evens and Kentner 2006

Global Rarity Rank: G3?

State Rarity Rank: S3?

State Rare: Y

Aesculus californica – *Umbellularia californica* Association
Aesculus californica Woodland Alliance

Surveys Used for Description

Total: N=3; San Mateo County (n=3): PGA1824, PGA758, PGA764

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree										
	<i>Aesculus californica</i>	100.0	59.9	31.7	20	50		Y		Y
	<i>Umbellularia californica</i>	100.0	26.4	11.0	3	15				Y
	<i>Quercus agrifolia</i>	100.0	13.8	8.7	1	20				Y
Regenerating or Shrubby Trees										
	<i>Fraxinus latifolia</i>	33.3	33.3	3.3	10	10				
Shrub										
	<i>Toxicodendron diversilobum</i>	100.0	39.9	12.7	3	25			Y	Y
	<i>Rubus ursinus</i>	66.7	28.6	13.7	1	40				Y
	<i>Baccharis pilularis</i>	66.7	6.5	0.4	0.2	1				Y
	<i>Eriodictyon californicum</i>	33.3	9.1	5.0	15	15				
	<i>Frangula californica</i>	33.3	6.0	3.3	10	10				
	<i>Symphoricarpos spp.</i>	33.3	5.5	3.3	10	10				
	<i>Rhamnus crocea</i>	33.3	3.0	1.7	5	5				
	<i>Sambucus racemosa</i>	33.3	1.3	0.1	0.2	0.2				
	<i>Lonicera hispidula</i>	33.3	0.1	0.1	0.2	0.2				
Herb										
	<i>Stachys ajugoides</i>	100.0	13.3	4.1	0.2	7				Y
	<i>Heracleum maximum</i>	66.7	19.1	10.0	10	20				Y
	<i>Sanicula crassicaulis</i>	66.7	3.6	1.7	0.2	5				Y
	<i>Aquilegia formosa</i>	66.7	0.2	0.1	0.2	0.2				Y
	<i>Marah fabaceus</i>	66.7	0.2	0.1	0.2	0.2				Y
	<i>Iris spp.</i>	33.3	16.7	3.3	10	10				
	<i>Urtica dioica</i>	33.3	13.1	8.3	25	25				
	<i>Claytonia perfoliata</i>	33.3	13.1	8.3	25	25				
	<i>Pteridium aquilinum</i>	33.3	10.4	5.0	15	15				
	<i>unknown Poaceae</i>	33.3	8.3	1.7	5	5				
	<i>Conium maculatum</i>	33.3	1.1	0.7	2	2				
	<i>Iris douglasiana</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Maianthemum dilatatum</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Maianthemum spp.</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Pentagramma</i>	33.3	0.1	0.1	0.2	0.2				
Aesculus californica – Umbellularia californica Association										
Aesculus californica Woodland Alliance										

<i>triangularis</i>					
<i>Artemisia douglasiana</i>	33.3	0.1	0.1	0.2	0.2
<i>Galium spp.</i>	33.3	0.1	0.1	0.2	0.2
<i>Scrophularia californica</i>	33.3	0.1	0.1	0.2	0.2

***Aesculus californica* / *Toxicodendron diversilobum* / Moss Association**

Common Name: California Buckeye / Poison Oak / Moss Woodland

Alliance: *Aesculus californica* Forest & Woodland Alliance

Local Vegetation Description

The California Buckeye / Poison Oak / Moss Association forms an intermittent to continuous tree canopy with an open to intermittent shrub understory. The dominant tree is *Aesculus californica*, and *Quercus agrifolia* and *Umbellularia californica* are characteristic or often present. Regenerating or shrubby trees that are often present include *Aesculus californica*. Commonly associated shrubs include *Toxicodendron diversilobum* and *Rubus ursinus*, and commonly associated herbs include *Dryopteris arguta*, *Claytonia perfoliata*, and *Marah fabaceus*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	1.0	0 – 5	27.5	20 – 35
Hardwood	61.7	40 – 75	10.5	5 – 15
Regenerating or Shrubby Tree	1.3	0 – 3.2	3.5	2 – 5
Shrub	20.5	13 – 45	2.5	1 – 5
Herb	14.8	2 – 70	0.6	0 – 2

Local Environmental Description

Elevation: Mean 216 m, Range 23 – 508 m

Aspect: NW (2), SE (2), NE (1), Variable (1)

Slope: Mean 20 degrees, Range 4 – 35 degrees

Macro Topography: Lower 1/3 of slope (3), Wash (channel bed) (1), Upper 1/3 of slope (1), Middle to Upper 1/3 of slope (1)

Large Rock: Mean 0.0%, Range 0.0 – 0.2%

Small Rock: Mean 0.2%, Range 0.0 – 1.2%

Fines Cover: Mean 11.4%, Range 3.0 – 19.0%

Litter Cover: Mean 72.5%, Range 10.0 – 96%

Soil Texture (field assessed): Medium to very fine, loamy sand (1), Medium to very fine, sandy loam (1), Moderately coarse, sandy loam (1), Moderately fine clay loam (1), Not recorded (1), Coarse, loamy sand (1)

Geology (field or map data): Volcanic flow rocks (2), Shale and other sedimentary (1), Greenstone (1), Franciscan melange (1), Sandy alluvium (most alluvial fans and washes) (1)

San Mateo County Watersheds: Palo Alto (2), San Mateo Bayside (2), Ano Nuevo (1), San Gregorio Creek (1)

Aesculus californica / *Toxicodendron diversilobum* / Moss Association
Aesculus californica Woodland Alliance

Site Impacts

This association has low non-native plant cover (average 5.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Carduus pycnocephalus*, *Conium maculatum*, and *Myosotis latifolia*.

Classification Comments

None.

References: Buck-Diaz et al. 2012, Evens et al. 2004, Kittel et al. 2012, Klein et al. 2007, Klein et al. 2015

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=7; San Mateo County (n=7): GGNRA323, PGA761, SMAT0061, SMAT0097, SMAT0112, SMAT0204, SMAT0251

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Aesculus californica</i>	100.0	91.1	59.3	35	80		Y		Y
	<i>Quercus agrifolia</i>	71.4	4.6	2.7	1	5				Y
	<i>Umbellularia californica</i>	57.1	2.3	1.6	0.2	5				Y
	<i>Pseudotsuga menziesii</i>	28.6	1.1	0.9	1	5				
Regenerating or Shrubby Trees	<i>Aesculus californica</i>	57.1	31.2	0.7	0.4	2				Y
	<i>Quercus agrifolia</i>	28.6	11.7	0.2	0.4	1				
	<i>Umbellularia californica</i>	28.6	5.7	0.2	0.2	1				
Shrub	<i>Toxicodendron diversilobum</i>	100.0	52.5	15.4	3	20		Y		Y
	<i>Rubus ursinus</i>	71.4	19.8	10.0	1	40				Y
	<i>Frangula californica</i>	42.9	7.8	2.3	1	10				
	<i>Sambucus nigra</i>	42.9	3.2	1.5	0.2	10				
	<i>Symphoricarpos albus</i>	42.9	1.1	0.5	0.2	3				
	<i>Rubus parviflorus</i>	28.6	3.1	1.5	0.2	10				
<i>Aesculus californica</i> / <i>Toxicodendron diversilobum</i> / Moss Association										
<i>Aesculus californica</i> Woodland Alliance										

	<i>Prunus ilicifolia</i>	28.6	2.9	1.3	2	7	
	<i>Symphoricarpos mollis</i>	28.6	1.5	0.5	0.2	3	
	<i>Baccharis pilularis</i>	28.6	0.8	0.2	0.2	1	
	<i>Ribes spp.</i>	28.6	0.5	0.2	0.2	1	
Herb							
	<i>Dryopteris arguta</i>	85.7	24.1	2.2	0.2	10	Y
	<i>Claytonia perfoliata</i>	57.1	2.1	0.8	0.2	5	Y
	<i>Marah fabaceus</i>	57.1	1.1	0.4	0.2	2	Y
	<i>Polystichum munitum</i>	42.9	14.2	1.6	0.2	10	
	<i>Heracleum maximum</i>	42.9	7.7	4.3	0.2	15	
	<i>Pteridium aquilinum</i>	42.9	5.4	0.5	0.2	3	
	<i>Galium aparine</i>	42.9	0.5	0.1	0.2	0.2	
	<i>Conium maculatum</i>	28.6	11.8	7.1	20	30	
	<i>Thalictrum fendleri</i>	28.6	5.7	4.3	0.2	30	
	<i>Adiantum jordanii</i>	28.6	1.5	0.1	0.2	0.2	
	<i>Galium porrigens</i>	28.6	1.4	0.1	0.2	0.2	
	<i>Chlorogalum pomeridianum</i>	28.6	1.3	0.1	0.2	0.2	
	<i>Clinopodium douglasii</i>	28.6	1.3	0.1	0.2	0.2	
	<i>Urtica dioica</i>	28.6	1.3	0.2	0.2	1	
	<i>Carduus pycnocephalus</i>	28.6	1.2	0.1	0.2	0.2	
	<i>Maianthemum spp.</i>	28.6	0.7	0.1	0.2	0.2	
	<i>Sanicula crassicaulis</i>	28.6	0.7	0.2	0.2	1	
	<i>Myosotis latifolia</i>	28.6	0.6	0.1	0.2	0.2	
	<i>Trillium chloropetalum</i>	28.6	0.6	0.1	0.2	0.2	
	<i>Iris douglasiana</i>	28.6	0.4	0.1	0.2	0.2	
Non-Vascular							
	Moss	42.9	28.7	1.9	0.2	10	
	Lichen	42.9	14.2	0.5	0.2	2	

***Alnus rhombifolia* Forest & Woodland Alliance**



Common Name: White alder groves

NVC Alliance Code: A3777. *Alnus rhombifolia* Riparian Forest Alliance

Statewide Description

Alnus rhombifolia is dominant or co-dominant in the tree canopy with *Acer macrophyllum*, *Chamaecyparis lawsoniana*, *Fraxinus latifolia*, *Notholithocarpus densiflorus*, *Platanus racemosa*, *Populus fremontii*, *Populus trichocarpa*, *Pseudotsuga menziesii*, *Quercus lobata*, *Salix spp.* and *Umbellularia californica*.

Alnus rhombifolia stands primarily occur in inland foothills and lower montane zones, usually as narrow strips along perennial stream courses throughout cismontane California. *Alnus rhombifolia* is well adapted to many flood regimes. Stands exist usually on seasonally flooded stream banks and channel bars just at or below the bank full level, but they occur sometimes in intermittently flooded floodplains and rarely in permanently saturated seeps. Flooding typically comes from winter floods and spring runoff.

Local Vegetation Description

The White alder groves Alliance forms an open to continuous tree canopy with an open to intermittent shrub understory. The dominant tree is *Alnus rhombifolia* and *Umbellularia californica*, and *Acer macrophyllum*, *Aesculus californica*, and *Quercus agrifolia* are characteristic or often present. Commonly associated shrubs include *Rubus*

Alnus rhombifolia Woodland Alliance

ursinus, *Toxicodendron diversilobum*, *Heteromeles arbutifolia*, and *Lonicera hispidula*, and commonly associated herbs include *Athyrium filix-femina*, *Equisetum telmateia*, *Pentagramma triangularis*, and *Polystichum munitum*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	2.6	0 – 6	27.5	10 – 35
Hardwood	31.8	20 – 50	10.5	5 – 20
Regenerating or Shrubby Tree	1.7	0 – 7.2	3.5	1 – 10
Shrub	20.3	4 – 40	2.5	1 – 2
Herb	15.2	5 – 32	0.6	0 – 0.5

Local Membership Rule

Alnus rhombifolia dominates or co-dominates with *Acer macrophyllum* or *Umbellularia californica* in the tree overstory. *Umbellularia californica* may be higher in cover, though stands for this type will often have other riparian trees along with *Alnus rhombifolia* to be classed here. If *Fraxinus latifolia* is co-dominant, key to the *Fraxinus latifolia* Alliance below. A variety of shrubs and herbs may be found in the understory, including *Rubus*, *Toxicodendron*, and numerous ferns. Careful identification of alder stands closer to the coast is necessary to differentiate from *A. rubra* stands.

Local Environmental Description

Elevation: Mean 162 m, Range 52 – 290 m

Aspect: Variable (2), Flat (2), SE (1)

Slope: Mean 34 degrees, Range 0 – 75 degrees

Macro Topography: Bottom (3), Middle 1/3 of slope (1), Bottom to Lower 1/3 of slope (1)

Large Rock: Mean 13.4%, Range 1.0 – 25.0%

Small Rock: Mean 11.0%, Range 1.2 – 25.0%

Fines Cover: Mean 22.3%, Range 1.0 – 65.0%

Litter Cover: Mean 28.8%, Range 2.0 – 70%

Soil Texture (field assessed): Medium to very fine, sandy loam (2), Medium silt (1), Moderately coarse, sandy loam (1)

Geology (field or map data): Franciscan melange (2), Sandstone (1), Ultramafic rocks, mostly serpentine (1), Volcanic and metavolcanic rocks (1), Mixed metamorphic (1)

San Mateo County Watersheds: Palo Alto (2), San Mateo Bayside (1)

Other Watersheds, Marin Co.: Lagunitas Creek (2), San Rafael (1)

Site Impacts

This alliance has low non-native plant cover (average 1.5%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Genista monspessulana* and *Trifolium dubium*.

Associations in San Mateo County

Alnus rhombifolia Woodland Alliance

- *Alnus rhombifolia* / *Carex (nudata)*
- *Alnus rhombifolia* – *Umbellularia californica* – (*Quercus chrysolepis*)

Classification Comments

Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: Evens and Kentner 2006, Keeler-Wolf and Evens 2006, Klein et al. 2007, Klein et al. 2015, Lee 2004

Global Rarity Rank: G4

State Rarity Rank: S4

Surveys Used for Description

Total: N=6; San Mateo County (n=3): PWALD01, SCLAR124, SMAT0024

Marin County (n=3): MMWD0185, MMWD0250, MMWD0332A

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Alnus rhombifolia</i>	100.0	41.9	17.7	7	30	Y		Y	Y
	<i>Umbellularia californica</i>	100.0	39.5	17.6	3	37.5	Y		Y	Y
	<i>Acer macrophyllum</i>	66.7	3.7	1.7	2	3				Y
	<i>Aesculus californica</i>	50.0	4.8	2.5	2	10				Y
	<i>Quercus agrifolia</i>	50.0	3.4	2.0	0.2	10				Y
	<i>Sequoia sempervirens</i>	33.3	2.7	1.0	0.2	6				
	<i>Pseudotsuga menziesii</i>	33.3	2.0	0.7	0.2	4				
Regenerating or Shrubby Trees	<i>Acer macrophyllum</i>	33.3	18.1	0.2	0.2	1				
	<i>Notholithocarpus densiflorus</i>	33.3	17.1	0.2	0.2	1				
Shrub	<i>Toxicodendron diversilobum</i>	83.3	11.2	2.3	0.2	7.4	Y			Y
	<i>Rubus ursinus</i>	83.3	11.1	2.2	0.2	7	Y			Y
	<i>Lonicera hispidula</i>	66.7	3.3	0.8	0.2	2.2				Y
	<i>Heteromeles arbutifolia</i>	50.0	6.2	0.4	0.2	2				Y
	<i>Salix lasiolepis</i>	33.3	16.5	3.7	2	20				Y
	<i>Corylus cornuta</i>	33.3	17.7	1.2	3	4				
	<i>Frangula californica</i>	33.3	0.4	0.1	0.2	0.2				

Herb

<i>Pentagramma triangularis</i>	66.7	6.2	0.1	0.2	0.2	Y
<i>Equisetum telmateia</i>	50.0	9.0	1.0	1	3	Y
<i>Polystichum munitum</i>	50.0	6.8	0.7	0.2	3	Y
<i>Athyrium filix-femina</i>	50.0	3.1	0.1	0.2	0.2	Y
<i>Adiantum jordanii</i>	33.3	4.5	0.5	0.2	3	
<i>Hierochloe occidentalis</i>	33.3	2.4	0.1	0.2	0.2	
<i>Woodwardia fimbriata</i>	33.3	0.7	0.1	0.2	0.2	
<i>Scrophularia californica</i>	33.3	2.0	0.1	0.2	0.2	
<i>Sanicula crassicaulis</i>	33.3	2.0	0.1	0.2	0.2	
<i>Madia madioides</i>	33.3	2.5	0.1	0.2	0.2	
<i>Carex globosa</i>	33.3	2.4	0.1	0.2	0.2	
<i>Artemisia douglasiana</i>	33.3	0.5	0.1	0.2	0.2	
<i>Melica torreyana</i>	33.3	2.5	0.1	0.2	0.2	

***Alnus rhombifolia* / *Carex (nudata)* Association**

Common Name: White Alder / (Torrent) Sedge Woodland

Alliance: *Alnus rhombifolia* Forest & Woodland Alliance

Local Vegetation Description

The White Alder / (Torrent) Sedge Association forms an open tree canopy with an open shrub understory in the single sample available. The dominant tree is *Alnus rhombifolia*, and *Aesculus californica*, *Salix laevigata*, *Sequoia sempervirens*, and *Umbellularia californica* are characteristic or often present.

Regenerating or shrubby trees that are dominant and characteristic include *Acer macrophyllum* and *Acer negundo*. Commonly associated shrubs include *Salix lasiolepis*, *Cornus sericea*, *Genista monspessulana*, *Physocarpus capitatus*, *Rubus ursinus*, and *Toxicodendron diversilobum*, and commonly associated herbs include *Carex nudata*, *Artemisia douglasiana*, *Equisetum telmateia*, *Juncus* spp., *Melissa officinalis*, *Mentha spicata*, *Typha latifolia*, and *Vinca major*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.2	N/A	27.5	20 – 35
Hardwood	30.0	N/A	17.5	15 – 20
Regenerating or Shrubby Tree	1.2	N/A	7.5	5 – 10
Shrub	3.8	N/A	1.5	1 – 2
Herb	15.0	N/A	0.3	0 – 0.5

Local Environmental Description

Elevation: 81 m

Aspect: Flat (1)

Slope: 0 degrees

Macro Topography: Bottom (1)

Large Rock: no data

Small Rock: no data

Fines Cover: 20.0%

Litter Cover: 2%

Soil Texture (field assessed): Medium to very fine, sandy loam (1)

Geology (field or map data): Sandstone (1)

San Mateo County Watersheds: Palo Alto (1)

Site Impacts

This association has low non-native plant cover (average 3.6%) relative to native cover. Non-native species that occur with highest frequency and abundance include

Alnus rhombifolia / *Carex (nudata)* Association
Alnus rhombifolia Woodland Alliance

Genista monspessulana, *Melissa officinalis*, *Mentha spicata*, and *Vinca major*.

Classification Comments

The name of this association has been updated to include other species of *Carex*.

References: Lee 2004, Klein et al. 2015

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: N

Surveys Used for Description

Total: N=1; San Mateo County (n=1): SCLAR124

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree										
	<i>Alnus rhombifolia</i>	100.0	82.8	26.0	26	26		Y		Y
	<i>Umbellularia californica</i>	100.0	9.6	3.0	3	3				Y
	<i>Aesculus californica</i>	100.0	6.4	2.0	2	2				Y
	<i>Salix laevigata</i>	100.0	0.6	0.2	0.2	0.2				Y
	<i>Sequoia sempervirens</i>	100.0	0.6	0.2	0.2	0.2				Y
Regenerating or Shrubby Trees										
	<i>Acer macrophyllum</i>	100.0	83.3	1.0	1	1		Y		Y
	<i>Acer negundo</i>	100.0	16.7	0.2	0.2	0.2				Y
Shrub										
	<i>Salix lasiolepis</i>	100.0	52.6	2.0	2	2		Y		Y
	<i>Genista monspessulana</i>	100.0	26.3	1.0	1	1				Y
	<i>Toxicodendron diversilobum</i>	100.0	5.3	0.2	0.2	0.2				Y
	<i>Rubus ursinus</i>	100.0	5.3	0.2	0.2	0.2				Y
	<i>Physocarpus capitatus</i>	100.0	5.3	0.2	0.2	0.2				Y
	<i>Cornus sericea</i>	100.0	5.3	0.2	0.2	0.2				Y
Herb										
	<i>Carex nudata</i>	100.0	61.0	5.0	5	5		Y		Y
	<i>Equisetum telmateia</i>	100.0	24.4	2.0	2	2				Y
	<i>Artemisia douglasiana</i>	100.0	2.4	0.2	0.2	0.2				Y
	<i>Juncus spp.</i>	100.0	2.4	0.2	0.2	0.2				Y
	<i>Melissa officinalis</i>	100.0	2.4	0.2	0.2	0.2				Y

Alnus rhombifolia / *Carex (nudata)* Association
Alnus rhombifolia Woodland Alliance

<i>Mentha spicata</i>	100.0	2.4	0.2	0.2	0.2	Y
<i>Typha latifolia</i>	100.0	2.4	0.2	0.2	0.2	Y
<i>Vinca major</i>	100.0	2.4	0.2	0.2	0.2	Y

***Alnus rhombifolia* – *Umbellularia californica* – (*Quercus chrysolepis*) Association**

Common Name: White Alder – California Laurel – (Canyon Live Oak) Woodland

Alliance: *Alnus rhombifolia* Forest & Woodland Alliance

Local Vegetation Description

The White Alder – California Laurel – (Canyon Live Oak) Association forms an intermittent to continuous tree canopy with an open to intermittent shrub understory. The co-dominant trees are *Alnus rhombifolia* and *Umbellularia californica*, and *Acer macrophyllum* and *Quercus agrifolia* are characteristic or often present. Commonly associated shrubs include *Lonicera hispidula*, *Rubus ursinus*, *Toxicodendron diversilobum*, and *Heteromeles arbutifolia*, and commonly associated herbs include *Pentagramma triangularis*, *Athyrium filix-femina*, and *Polystichum munitum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	3.3	0 – 6	15.0	10 – 20
Hardwood	32.3	20 – 50	10.8	5 – 15
Regenerating or Shrubby Tree	1.8	0 – 7.2	1.5	1 – 2
Shrub	20.3	4 – 40	1.5	1 – 2
Herb	15.3	5 – 32	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 178 m, Range 52 – 290 m

Aspect: Variable (2), Flat (1), SE (1)

Slope: Mean 43 degrees, Range 2 – 75 degrees

Macro Topography: Bottom (2), Bottom to Lower 1/3 of slope (1), Middle 1/3 of slope (1)

Large Rock: Mean 13.4%, Range 1.0 – 25.0%

Small Rock: Mean 11.0%, Range 1.2 – 25.0%

Fines Cover: Mean 22.8%, Range 1.0 – 65.0%

Litter Cover: Mean 34.2%, Range 15.0 – 70%

Soil Texture (field assessed): Medium silt (1), Medium to very fine, sandy loam (1), Moderately coarse, sandy loam (1)

Geology (field or map data): Franciscan melange (2), Mixed metamorphic (1), Ultramafic rocks, mostly serpentine (1), Volcanic and metavolcanic rocks (1)

San Mateo County Watersheds: Palo Alto (1), San Mateo Bayside (1)

Other Watersheds, Marin Co.: Lagunitas Creek (2), San Rafael (1)

Site Impacts

This association has low non-native plant cover (average 1.1%) relative to native cover.

Alnus rhombifolia – *Umbellularia californica* – (*Quercus chrysolepis*) Association

Non-native species that occur with highest frequency and abundance include *Avena* spp., *Carduus pycnocephalus*, *Conium maculatum*, *Geranium dissectum*, *Myosotis latifolia*, and *Trifolium dubium*.

Classification Comments

This association has been renamed from the *Umbellularia californica* – *Alnus rhombifolia* Association to better fit the species composition in the southern Sierra Nevada Foothills. It was originally placed in the *Umbellularia californica* Alliance. Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Evens and Kentner 2006, Keeler-Wolf and Evens 2006, Klein et al. 2007

Global Rarity Rank: G3

State Rarity Rank: S3

State Rare: Y

Surveys Used for Description

Total: N=5; San Mateo County (n=2): PWALD01, SMAT0024

Marin County (n=3): MMWD0185, MMWD0250, MMWD0332A

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Umbellularia californica</i>	100.0	45.5	20.5	10	37.5			Y	Y
	<i>Alnus rhombifolia</i>	100.0	33.7	16.0	7	30			Y	Y
	<i>Acer macrophyllum</i>	80.0	4.5	2.0	2	3				Y
	<i>Quercus agrifolia</i>	60.0	4.1	2.4	0.2	10				Y
	<i>Aesculus californica</i>	40.0	4.5	2.6	3	10				
	<i>Pseudotsuga menziesii</i>	40.0	2.4	0.8	0.2	4				
Regenerating or Shrubby Trees	<i>Notholithocarpus densiflorus</i>	40.0	20.6	0.2	0.2	1				
Shrub	<i>Toxicodendron diversilobum</i>	80.0	12.4	2.7	0.2	7.4				Y
	<i>Rubus ursinus</i>	80.0	12.2	2.6	0.2	7				Y
	<i>Lonicera hispidula</i>	80.0	4.0	0.9	0.2	2.2				Y
	<i>Heteromeles arbutifolia</i>	60.0	7.4	0.5	0.2	2				Y
	<i>Corylus cornuta</i>	40.0	21.3	1.4	3	4				
	<i>Frangula californica</i>	40.0	0.4	0.1	0.2	0.2				
Herb										

Alnus rhombifolia – *Umbellularia californica* – (*Quercus chrysolepis*) Association

<i>Athyrium filix-femina</i>	60.0	3.7	0.1	0.2	0.2	Y
<i>Equisetum telmateia</i>	40.0	6.0	0.8	1	3	Y
<i>Adiantum jordanii</i>	40.0	5.4	0.6	0.2	3	Y
<i>Madia radioides</i>	40.0	3.0	0.1	0.2	0.2	
<i>Melica torreyana</i>	40.0	3.0	0.1	0.2	0.2	
<i>Carex globosa</i>	40.0	2.9	0.1	0.2	0.2	
<i>Hierochloe occidentalis</i>	40.0	2.9	0.1	0.2	0.2	
<i>Sanicula crassicaulis</i>	40.0	2.4	0.1	0.2	0.2	
<i>Scrophularia californica</i>	40.0	2.4	0.1	0.2	0.2	
<i>Woodwardia fimbriata</i>	40.0	0.9	0.1	0.2	0.2	

***Arbutus menziesii* Forest Alliance**



Common Name: Madrone forest

NVC Alliance Code: A3357. *Notholithocarpus densiflorus* - *Arbutus menziesii* Forest Alliance

Statewide Description

Arbutus menziesii is dominant or co-dominant in the tree canopy with *Acer macrophyllum*, *Notholithocarpus densiflorus*, *Pseudotsuga menziesii*, *Quercus agrifolia*, *Quercus chrysolepis*, *Quercus kelloggii*, *Quercus wislizeni*, and *Umbellularia californica*.

Arbutus menziesii groves have traditionally been considered part of the “mixed evergreen forest” and not treated as a separate type (Sawyer 2007). Although *A. menziesii* is common as a secondary species in many forest types, it does form distinctive stands of high cover worthy of recognition in parts of the state that have relatively snow-free winters but upwards of 100 cm of annual precipitation. Stands in northern parts of the state mix with those of the *Pseudotsuga menziesii* – *Notholithocarpus densiflorus* Alliance.

Local Vegetation Description

The Madrone forest Alliance forms an open to continuous tree canopy with an open to intermittent shrub understory. The dominant tree is *Arbutus menziesii*, and *Pseudotsuga menziesii*, *Quercus agrifolia*, and *Umbellularia californica* are characteristic or often present. Commonly associated shrubs include *Toxicodendron diversilobum*, *Lonicera*

Arbutus menziesii Woodland Alliance

hispidula, *Rubus ursinus*, *Frangula californica*, and *Heteromeles arbutifolia*, and commonly associated herbs include *Clinopodium douglasii* and *Sanicula crassicaulis*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	2.4	0 – 10	17.5	15 – 20
Hardwood	56.8	30 – 80	12.5	10 – 15
Regenerating or Shrubby Tree	7.1	0 – 37.4	3.5	2 – 5
Shrub	18.4	2 – 50	0.5	0 – 1
Herb	18.6	3 – 40	0.3	0 – 0.5

Local Membership Rule

Arbutus menziesii is either dominant with sub-dominant *Quercus agrifolia* or is dominant to co-dominant with *Quercus kelloggii* and/or *Umbellularia californica*. *Pseudotsuga menziesii*, *Heteromeles arbutifolia*, and *Toxicodendron diversilobum* are often present. If *Arbutus* is sub- to co-dominant with *Quercus agrifolia*, *Q. chrysolepis*, or *Notholithocarpus densiflorus*, key to the one of these alliances instead of *A. menziesii*.

Local Environmental Description

Elevation: Mean 283 m, Range 114 – 493 m

Aspect: Flat (1), NE (1)

Slope: Mean 8 degrees, Range 0 – 15 degrees

Macro Topography: Middle 1/3 of slope (1), Upper 1/3 of slope to Ridgetop (1)

Large Rock: Mean 3.0%, Range 0.0 – 12.0%

Small Rock: Mean 0.5%, Range 0.0 – 2.0%

Fines Cover: Mean 3.7%, Range 1.0 – 8.0%

Litter Cover: Mean 89.8%, Range 80.0 – 100%

Soil Texture (field assessed): Coarse, loamy sand (1), Moderately fine clay loam (1)

Geology (field or map data): Shale and other sedimentary (6), Sandstone (1)

San Mateo County Watersheds: San Mateo Bayside (4), Palo Alto (3)

Site Impacts

This alliance has low non-native plant cover (average 2.6%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Cotoneaster pannosus*, *Epipactis helleborine*, and *Torilis arvensis*.

Associations in San Mateo County

- *Arbutus menziesii* – (*Quercus agrifolia*)
- *Arbutus menziesii* – *Umbellularia californica*

Classification Comments

None.

References: Evens and Kentner 2006, Klein et al. 2015

Global Rarity Rank: G4

State Rarity Rank: S3

Surveys Used for Description

Total: N=7; San Mateo County (n=7): GGNRA331, PGA1046, PGA782, PGA815A, PWMEF02A, PWMEF05A, SMAT0035

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree										
	<i>Arbutus menziesii</i>	85.7	53.3	31.1	18	50	Y	Y		Y
	<i>Quercus agrifolia</i>	71.4	14.4	6.7	5	12				Y
	<i>Umbellularia californica</i>	71.4	6.8	4.2	0.2	15				Y
	<i>Pseudotsuga menziesii</i>	57.1	2.4	1.9	0.2	10				Y
	<i>Notholithocarpus densiflorus</i>	42.9	7.1	6.5	0.2	25				
Regenerating or Shrubby Trees										
	<i>Arbutus menziesii</i>	28.6	17.7	5.2	5.2	31				Y
	<i>Quercus agrifolia</i>	28.6	2.6	0.3	0.2	2.2				Y
Shrub										
	<i>Toxicodendron diversilobum</i>	100.0	33.9	8.3	0.2	20	Y		Y	Y
	<i>Lonicera hispidula</i>	85.7	9.6	2.1	0.2	5	Y			Y
	<i>Rubus ursinus</i>	85.7	1.6	0.3	0.2	1	Y			Y
	<i>Frangula californica</i>	71.4	12.7	1.9	0.2	5				Y
	<i>Heteromeles arbutifolia</i>	57.1	6.7	1.3	0.2	6				Y
	<i>Diplacus aurantiacus</i>	42.9	16.7	8.6	0.2	30				
	<i>Arctostaphylos crustacea</i>	42.9	1.7	0.7	0.2	4				
	<i>Baccharis pilularis</i>	42.9	3.1	0.5	0.2	3				
	<i>Vaccinium ovatum</i>	28.6	6.7	0.7	0.2	5				
	<i>Symphoricarpos albus</i>	28.6	0.4	0.1	0.2	0.2				
	<i>Rosa spp.</i>	28.6	0.4	0.1	0.2	0.2				
	<i>Lepechinia calycina</i>	28.6	0.2	0.1	0.2	0.2				
	<i>Cotoneaster pannosus</i>	28.6	0.3	0.1	0.2	0.2				
	<i>Symphoricarpos spp.</i>	28.6	0.5	0.1	0.2	0.2				
Herb										
	<i>Sanicula crassicaulis</i>	71.4	6.7	0.1	0.2	0.2				Y
	<i>Clinopodium douglasii</i>	57.1	12.2	1.0	0.2	3				Y

Arbutus menziesii Woodland Alliance

<i>Pedicularis densiflora</i>	42.9	15.7	2.6	0.2	10
<i>Cynoglossum grande</i>	42.9	3.0	0.1	0.2	0.2
<i>Dryopteris arguta</i>	28.6	4.2	1.5	0.2	10
<i>Bromus carinatus</i>	28.6	3.0	0.5	0.2	3
<i>Madia madioides</i>	28.6	0.6	0.1	0.2	0.2
<i>Torilis arvensis</i>	28.6	0.6	0.1	0.2	0.2
<i>Sanicula laciniata</i>	28.6	0.6	0.1	0.2	0.2
<i>Osmorhiza berteroi</i>	28.6	0.6	0.1	0.2	0.2
<i>Iris douglasiana</i>	28.6	0.6	0.1	0.2	0.2
<i>Galium californicum</i>	28.6	0.6	0.1	0.2	0.2
<i>Fragaria vesca</i>	28.6	0.6	0.1	0.2	0.2
<i>Epipactis helleborine</i>	28.6	0.6	0.1	0.2	0.2
<i>Elymus glaucus</i>	28.6	0.3	0.1	0.2	0.2
<i>Bromus laevipes</i>	28.6	0.6	0.1	0.2	0.2
<i>Bromus vulgaris</i>	28.6	0.6	0.1	0.2	0.2
Non-Vascular					
Moss	42.9	42.9	2.0	1	10

***Arbutus menziesii* – (*Quercus agrifolia*) Association**

Common Name: Madrone – (Coast Live Oak) Woodland

Alliance: *Arbutus menziesii* Forest Alliance

Local Vegetation Description

The Madrone – (Coast Live Oak) Association forms an open to continuous tree canopy with an open to intermittent shrub understory. The dominant tree is *Arbutus menziesii*, and *Quercus agrifolia* and *Umbellularia californica* are characteristic or often present. Commonly associated shrubs include *Toxicodendron diversilobum*, *Lonicera hispidula*, *Rubus ursinus*, *Diplacus aurantiacus*, *Frangula californica*, and *Heteromeles arbutifolia*, and commonly associated herbs include *Sanicula crassicaulis*, *Clinopodium douglasii*, and *Pedicularis densiflora*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	3.3	0 – 10	no data	no data
Hardwood	56.7	30 – 80	no data	no data
Regenerating or Shrubby Tree	7.5	0 – 37.4	no data	no data
Shrub	25.0	10 – 50	no data	no data
Herb	16.7	15 – 20	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 235 m, Range 114 – 493 m

Aspect: NE (1)

Slope: Mean 15 degrees, Range 15 – 15 degrees

Macro Topography: Middle 1/3 of slope (1)

Large Rock: Mean 4.0%, Range 0.0 – 12.0%

Small Rock: Mean 0.7%, Range 0.0 – 2.0%

Fines Cover: Mean 1.5%, Range 1.0 – 2.0%

Litter Cover: Mean 89.7%, Range 80.0 – 100%

Soil Texture (field assessed): Moderately fine clay loam (1)

Geology (field or map data): Shale and other sedimentary (5)

San Mateo County Watersheds: San Mateo Bayside (3), Palo Alto (2)

Site Impacts

This association has low non-native plant cover (average 3.6%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Cotoneaster pannosus*, *Epipactis helleborine*, and *Torilis arvensis*.

Classification Comments

This association encompasses surveys previously assigned to *Arbutus menziesii*

Arbutus menziesii – (*Quercus agrifolia*) Association
Arbutus menziesii Woodland Alliance

Association and *Arbutus menziesii* – *Quercus agrifolia* Association.

References: Evens and Kentner 2006, Klein et al. 2015

Global Rarity Rank: G3

State Rarity Rank: S3?

State Rare: Y

Surveys Used for Description

Total: N=5; San Mateo County (n=5): GGNRA331, PGA1046, PGA815A, PWMEF02A, PWMEF05A

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Arbutus menziesii</i>	80.0	53.0	28.6	18	50		Y		Y
	<i>Quercus agrifolia</i>	80.0	18.0	8.4	10	12				Y
	<i>Umbellularia californica</i>	60.0	1.9	0.8	0.2	3				Y
	<i>Notholithocarpus densiflorus</i>	40.0	4.5	4.0	0.2	20				
	<i>Pseudotsuga menziesii</i>	40.0	2.3	2.0	0.2	10				
	Regenerating or Shrubby Trees	<i>Quercus agrifolia</i> *	50	16.7	0.1	0.2	0.2			
<i>Quercus kelloggii</i> *		50	16.7	0.1	0.2	0.2				Y
<i>Umbellularia californica</i> *50			16.7	0.1	0.2	0.2				Y
Shrub	<i>Toxicodendron diversilobum</i>	100.0	31.8	9.3	0.2	20			Y	Y
	<i>Rubus ursinus</i>	100.0	0.9	0.2	0.2	0.2				Y
	<i>Lonicera hispidula</i>	80.0	6.7	1.8	0.2	3				Y
	<i>Diplacus aurantiacus</i>	60.0	23.4	12.0	0.2	30				Y
	<i>Frangula californica</i>	60.0	14.8	2.2	3	5				Y
	<i>Arctostaphylos crustacea</i>	60.0	2.3	1.0	0.2	4				Y
	<i>Heteromeles arbutifolia</i>	60.0	1.3	0.6	0.2	2				Y
	<i>Vaccinium ovatum</i>	40.0	9.3	1.0	0.2	5				
	<i>Rosa spp.</i>	40.0	0.6	0.1	0.2	0.2				
	<i>Cotoneaster pannosus</i>	40.0	0.4	0.1	0.2	0.2				
	<i>Baccharis pilularis</i>	40.0	0.3	0.1	0.2	0.2				

Arbutus menziesii – (*Quercus agrifolia*) Association
Arbutus menziesii Woodland Alliance

Herb	<i>Lepechinia calycina</i>	40.0	0.2	0.1	0.2	0.2	
	<i>Sanicula crassicaulis</i>	80.0	6.1	0.2	0.2	0.2	Y
	<i>Pedicularis densiflora</i>	60.0	22.0	3.7	0.2	10	Y
	<i>Clinopodium douglasii</i>	60.0	13.8	1.4	1	3	Y
	<i>Bromus carinatus</i>	40.0	4.2	0.6	0.2	3	
	<i>Galium californicum</i>	40.0	0.9	0.1	0.2	0.2	
	<i>Bromus laevipes</i>	40.0	0.8	0.1	0.2	0.2	
	<i>Torilis arvensis</i>	40.0	0.8	0.1	0.2	0.2	
	<i>Iris douglasiana</i>	40.0	0.8	0.1	0.2	0.2	
	<i>Bromus vulgaris</i>	40.0	0.8	0.1	0.2	0.2	
	<i>Cynoglossum grande</i>	40.0	0.8	0.1	0.2	0.2	
	<i>Epipactis helleborine</i>	40.0	0.8	0.1	0.2	0.2	
	<i>Sanicula laciniata</i>	40.0	0.8	0.1	0.2	0.2	
	<i>Osmorhiza berteroi</i>	40.0	0.8	0.1	0.2	0.2	
	<i>Madia madioides</i>	40.0	0.8	0.1	0.2	0.2	
<i>Fragaria vesca</i>	40.0	0.8	0.1	0.2	0.2		
<i>Elymus glaucus</i>	40.0	0.5	0.1	0.2	0.2		
Non-Vascular							
	<i>Moss</i>	60.0	60.0	2.8	1	10	Y

***Arbutus menziesii* – *Umbellularia californica* Association**

Common Name: Madrone – California Bay Woodland

Alliance: *Arbutus menziesii* Forest Alliance

Local Vegetation Description

The Madrone – California Bay Association forms an intermittent to continuous tree canopy with an open shrub understory. The dominant tree is *Arbutus menziesii*, and *Umbellularia californica* is characteristic. Commonly associated shrubs include *Frangula californica*, *Lonicera hispidula*, and *Toxicodendron diversilobum*, and commonly associated herbs include *Dryopteris arguta*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	1.0	1 – 1	17.5	15 – 20
Hardwood	57.0	35 – 79	12.5	10 – 15
Regenerating or Shrubby Tree	6.3	0 – 12.6	3.5	2 – 5
Shrub	8.5	2 – 15	0.5	0 – 1
Herb	21.5	3 – 40	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 403 m, Range 356 – 450 m

Aspect: Flat (1)

Slope: Mean 0 degrees, Range 0 – 0 degrees

Macro Topography: Upper 1/3 of slope to Ridgetop (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: 8.0%

Litter Cover: 90%

Soil Texture (field assessed): Coarse, loamy sand (1)

Geology (field or map data): Sandstone (1), Shale and other sedimentary (1)

San Mateo County Watersheds: Palo Alto (1), San Mateo Bayside (1)

Site Impacts

This association has very low non-native plant cover (average 0.3%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Conium maculatum* and *Genista monspessulana*.

Classification Comments

None.

References: Evens and Kentner 2006, Klein et al. 2015

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Arbutus menziesii – *Umbellularia californica* Association
Arbutus menziesii Woodland Alliance

Surveys Used for Description

Total: N=2; San Mateo County (n=2): PGA782, SMAT0035

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree										
	<i>Arbutus menziesii</i>	100.0	54.1	37.5	25	50		Y		Y
	<i>Umbellularia californica</i>	100.0	18.9	12.5	10	15				Y
	<i>Pseudotsuga menziesii</i>	100.0	2.7	1.5	1	2				Y
	<i>Notholithocarpus densiflorus</i>	50.0	13.7	12.5	25	25				Y
	<i>Quercus agrifolia</i>	50.0	5.3	2.5	5	5				Y
	<i>Quercus lobata</i>	50.0	5.3	2.5	5	5				Y
Regenerating or Shrubby Trees										
	<i>Arbutus menziesii</i>	50.0	20.6	2.6	5.2	5.2				Y
	<i>Umbellularia californica</i>	50.0	20.6	2.6	5.2	5.2				Y
	<i>Quercus agrifolia</i>	50.0	8.7	1.1	2.2	2.2				Y
Shrub										
	<i>Toxicodendron diversilobum</i>	100.0	39.2	6.0	2	10			Y	Y
	<i>Lonicera hispidula</i>	100.0	16.9	2.6	0.2	5				Y
	<i>Frangula californica</i>	100.0	7.4	1.1	0.2	2				Y
	<i>Heteromeles arbutifolia</i>	50.0	20.3	3.0	6	6				Y
	<i>Baccharis pilularis</i>	50.0	10.1	1.5	3	3				Y
	<i>Rubus ursinus</i>	50.0	3.4	0.5	1	1				Y
	<i>Symphoricarpos albus</i>	50.0	0.7	0.1	0.2	0.2				Y
	<i>Genista monspessulana</i>	50.0	0.7	0.1	0.2	0.2				Y
	<i>Arctostaphylos regismontana</i>	50.0	0.7	0.1	0.2	0.2				Y
	<i>Symphoricarpos spp.</i>	50.0	0.6	0.1	0.2	0.2				Y
Herb										
	<i>Melica spp.</i>	50.0	21.4	7.5	15	15				Y
	<i>Iris spp.</i>	50.0	14.3	5.0	10	10				Y
	<i>Dryopteris arguta</i>	50.0	14.3	5.0	10	10				Y
	<i>Marah spp.</i>	50.0	8.3	0.1	0.2	0.2				Y
	<i>Clinopodium douglasii</i>	50.0	8.3	0.1	0.2	0.2				Y
	<i>Arbutus menziesii</i> – <i>Umbellularia californica</i> Association									
	<i>Arbutus menziesii</i> Woodland Alliance									

<i>Conium maculatum</i>	50.0	8.3	0.1	0.2	0.2	Y
<i>Cynoglossum grande</i>	50.0	8.3	0.1	0.2	0.2	Y
<i>Sanicula crassicaulis</i>	50.0	8.3	0.1	0.2	0.2	Y
<i>Juncus patens</i>	50.0	8.3	0.1	0.2	0.2	Y

***Eucalyptus* spp. – *Ailanthus altissima* – *Robinia pseudoacacia* Woodland Semi- Natural Alliance**



Common Name: Eucalyptus – tree of heaven – black locust groves

NVC Alliance Code: A0084. *Eucalyptus* spp. Ruderal Forest Alliance

Statewide Description

Ailanthus altissima, *Acacia melanoxylon*, one or more species of *Eucalyptus*, and/or *Robinia pseudoacacia* is dominant in the tree canopy.

Understories in groves of the fast-growing, long-lived *Eucalyptus* trees are usually depauperate. A buildup of allelopathic chemicals in the soil and high volumes of debris inhibit the establishment of other plants, though sometimes other non-natives, such as *Hedera helix*, clamber extensively in stands. Seeds of *Eucalyptus* germinate when tree crowns and built-up debris are removed by fire or in other ways. Tree stumps sprout readily from the lignotuber when trees are felled (Boyd 2000, Bean and Russo 2005, Esser 1993b, Skolmen and Ledig 1990).

In stands dominated by *Ailanthus altissima*, the understory may be dominated by non-native annual grasses. *Acacia melanoxylon* or *Robinia pseudoacacia* dominated stands have an open to intermittent shrub layer and an herbaceous layer may be open or dominated by non-native grasses.

Local Vegetation Description

Eucalyptus spp. – *Ailanthus altissima* – *Robinia pseudoacacia* Woodland Semi-Natural Alliance

The Eucalyptus – tree of heaven – black locust groves Alliance forms an open to continuous tree canopy with an open to continuous shrub understory. *Eucalyptus globulus* and/or *Acacia melanoxylon* are characteristic or often present. Commonly associated shrubs include *Rubus ursinus*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	3.3	0 – 15	18.8	10 – 35
Hardwood	55.8	20 – 80	20.0	10 – 35
Regenerating or Shrubby Tree	3.0	0 – 15.8	8.5	2 – 15
Shrub	22.8	2 – 85	1.5	0 – 5
Herb	12.0	0.2 – 80	0.3	0 – 1

Local Membership Rule

A tree species of *Eucalyptus*, *Acacia melanoxylon*, or *Ailanthus altissima* dominates in planted or naturalized stands. Often found in groves, windbreaks, uplands, and along stream courses. Stands were observed but rarely sampled in San Mateo County. For shrubby species of *Acacia*, see the Naturalized Non-Native Mediterranean Scrub Group.

Local Environmental Description

Elevation: Mean 112 m, Range 11 – 331 m

Aspect: SW (2), Variable (1), NW (1), Flat (1), SE (1)

Slope: Mean 15 degrees, Range 0 – 30 degrees

Macro Topography: Lower to Middle 1/3 of slope (2), Middle 1/3 of slope (2), Lower 1/3 of slope (1), Bottom to Lower 1/3 of slope (1)

Large Rock Mean 0.0%, Range 0.0 – 0.0%

Small Rock: Mean 0.0%, Range 0.0 – 0.0%

Fines Cover: Mean 6.5%, Range 0.0 – 20.0%

Litter Cover: Mean 89.5%, Range 75.0 – 96%

Soil Texture (field assessed): Fine silty clay (2), Moderately fine sandy clay loam (2), Medium to very fine, loamy sand (1), Fine clay (1)

Geology (field or map data): Sandstone and other sedimentary (2), Volcanic and metavolcanic rocks (2), Franciscan melange (2), Alluvium (2), Granitic (1), Shale and other sedimentary (1)

San Mateo County Watersheds: Tunitas Creek (4), San Francisco Coastal (2), San Mateo Bayside (2), Pacifica (1), Pescadero Creek (1)

Site Impacts

This alliance has greater cover of exotics than natives, non-native plant cover averages 64.4% relative to native cover. Non-native species that occur with highest frequency and abundance include *Acacia melanoxylon*, *Cortaderia jubata*, *Eucalyptus globulus*, *Geranium dissectum*, *Oxalis pes-caprae*, and *Sonchus asper*.

Associations in San Mateo County

- *Acacia melanoxylon*
- *Eucalyptus (globulus, camaldulensis)*

Classification Comments

None.

References: AECOM 2013, AIS 2007b, AIS and ESRI 2007, Buck-Diaz et al. 2012, Evens and San 2005, HDR 2014a, Hickson and Keeler-Wolf 2007, Keeler-Wolf and Evens 2006, Keeler-Wolf et al. 2003a, Klein et al. 2007, Klein et al. 2015, Menke et al. 2011, Rana Creek Habitat Restoration 2002, Sproul et al. 2011, Stillwater Sciences 2007a, Thorne et al. 2004, VegCAMP 2005b, VegCAMP 2015a, Verdone and Evens 2010

Global Rarity Rank: GNA

State Rarity Rank: SNA

Surveys Used for Description

Total: N=11; San Mateo County (n=11): PGA1034, PGA11175, PGA900A, PGA901, PGA903, SMAT0014, SMAT0081, SMAT0131, SMAT0163, SMAT0173, SMAT0174

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Eucalyptus globulus</i>	72.7	63.5	36.0	12	80				Y
	<i>Hesperocyparis macrocarpa</i>	36.4	5.6	2.7	0.2	15				
	<i>Acacia melanoxylon</i>	27.3	26.1	18.2	60	75				
	<i>Pinus radiata</i>	27.3	2.4	1.5	1	15				
Regenerating or Shrubby Trees	<i>Acacia melanoxylon</i>	27.3	24.5	1.5	0.2	11				
Shrub	<i>Rubus ursinus</i>	90.9	42.1	17.6	0.2	75	Y		Y	Y
	<i>Toxicodendron diversilobum</i>	45.5	28.5	8.7	1	60				
	<i>Sambucus racemosa</i>	27.3	15.5	1.9	0.2	20				
	<i>Frangula californica</i>	27.3	0.9	0.4	0.2	2				
Herb	<i>Galium aparine</i>	45.5	10.1	1.2	1	5				

<i>Sanicula crassicaulis</i>	45.5	5.5	0.2	0.2	1
<i>Oxalis pes-caprae</i>	36.4	1.4	0.1	0.2	1
<i>Polystichum munitum</i>	36.4	3.4	0.1	0.2	0.2
<i>Heracleum maximum</i>	27.3	7.3	1.1	0.2	10
<i>Scrophularia californica</i>	27.3	1.9	0.3	0.2	2
<i>Geranium dissectum</i>	27.3	1.0	0.1	0.2	1
<i>Sonchus asper</i>	27.3	0.5	0.1	0.2	0.2
<i>Cortaderia jubata</i>	27.3	0.5	0.1	0.2	0.2

***Acacia melanoxylon* Provisional Semi-natural Association**

Common Name: Blackwood Acacia Woodland

Alliance: *Eucalyptus* spp. – *Ailanthus altissima* – *Robinia pseudoacacia* Woodland
Semi-Natural Alliance

Local Vegetation Description

The Blackwood Acacia Association forms an intermittent to continuous tree canopy with an open to intermittent shrub understory. The dominant tree is *Acacia melanoxylon*. Regenerating or shrubby trees that are dominant and characteristic include *Acacia melanoxylon*. Commonly associated shrubs include *Rubus ursinus* and *Sambucus racemosa*, and commonly associated herbs include *Sanicula crassicaulis*, *Galium aparine*, *Oxalis pes-caprae*, and *Polystichum munitum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	3.0	0 – 5	15.0	10 – 20
Hardwood	66.7	60 – 75	12.5	10 – 15
Regenerating or Shrubby Tree	7.1	0.2 – 15.8	6.2	2 – 10
Shrub	17.0	2 – 38	1.5	0 – 5
Herb	2.4	0.2 – 5	0.4	0 – 1

Local Environmental Description

Elevation: Mean 126 m, Range 22 – 331 m

Aspect: SE (1), NW (1), Flat (1)

Slope: Mean 7 degrees, Range 0 – 19 degrees

Macro Topography: Lower 1/3 of slope (1), Lower to Middle 1/3 of slope (1), Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 4.0%, Range 0.0 – 10.0%

Litter Cover: Mean 92.3%, Range 86.0 – 96%

Soil Texture (field assessed): Fine silty clay (1), Moderately fine sandy clay loam (1), Fine clay (1)

Geology (field or map data): Alluvium (2), Shale and other sedimentary (1)

San Mateo County Watersheds: Tunitas Creek (3)

Site Impacts

This association has greater cover of exotics (average 76.4%) than natives. Non-native species that occur with highest frequency and abundance include *Acacia melanoxylon*, *Hedera helix*, and *Hesperocyparis macrocarpa*.

Classification Comments

Acacia melanoxylon Provisional Semi-natural Association
Eucalyptus spp. – *Ailanthus altissima* – *Robinia pseudoacacia* Woodland Semi-Natural Alliance

This association is considered provisional since it is under-sampled in its expected range. It is newly described here.

References: none

Global Rarity Rank: GNA

State Rarity Rank: SNA

State Rare: N

Surveys Used for Description

Total: N=3; San Mateo County (n=3): SMAT0081, SMAT0163, SMAT0173

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Acacia melanoxylon</i>	100.0	95.5	66.7	60	75		Y		Y
	<i>Hesperocyparis macrocarpa</i>	33.3	2.4	1.7	5	5				Y
	<i>Umbellularia californica</i>	33.3	1.0	0.7	2	2				Y
	<i>Sequoia sempervirens</i>	33.3	1.0	0.7	2	2				Y
Regenerating or Shrubby Trees	<i>Acacia melanoxylon</i>	100.0	89.9	5.5	0.2	11		Y		Y
	<i>Sequoia sempervirens</i>	33.3	4.6	0.7	2.2	2.2				
	<i>Notholithocarpus densiflorus</i>	33.3	2.5	0.4	1.2	1.2				
	<i>Umbellularia californica</i>	33.3	2.1	0.3	1	1				
	<i>Quercus agrifolia</i>	33.3	0.8	0.1	0.4	0.4				
Shrub	<i>Rubus ursinus</i>	100.0	64.9	15.1	0.2	35		Y		Y
	<i>Sambucus racemosa</i>	66.7	24.0	0.4	0.2	1				Y
	<i>Rubus armeniacus</i>	33.3	4.8	0.1	0.2	0.2				
	<i>Symphoricarpos mollis</i>	33.3	3.0	0.3	1	1				
	<i>Hedera helix</i>	33.3	1.7	0.7	2	2				
	<i>Toxicodendron diversilobum</i>	33.3	0.9	0.3	1	1				
	<i>Heteromeles arbutifolia</i>	33.3	0.6	0.1	0.2	0.2				
	<i>Baccharis pilularis</i>	33.3	0.2	0.1	0.2	0.2				

Herb

<i>Sanicula crassicaulis</i>	100.0	19.4	0.7	0.2	1	Y
<i>Galium aparine</i>	66.7	23.4	2.0	1	5	Y
<i>Polystichum munitum</i>	66.7	11.9	0.1	0.2	0.2	Y
<i>Oxalis pes-caprae</i>	66.7	1.7	0.1	0.2	0.2	Y
<i>Conium maculatum</i>	33.3	13.5	1.0	3	3	
<i>Myosotis discolor</i>	33.3	11.1	0.1	0.2	0.2	
<i>Scrophularia californica</i>	33.3	4.5	0.3	1	1	
<i>Stachys bullata</i>	33.3	3.8	0.3	1	1	
<i>Fumaria capreolata</i>	33.3	0.9	0.1	0.2	0.2	
<i>Chlorogalum pomeridianum</i>	33.3	0.9	0.1	0.2	0.2	
<i>Juncus patens</i>	33.3	0.9	0.1	0.2	0.2	
<i>Geranium dissectum</i>	33.3	0.9	0.1	0.2	0.2	
<i>Sonchus asper</i>	33.3	0.9	0.1	0.2	0.2	
<i>Anagallis arvensis</i>	33.3	0.9	0.1	0.2	0.2	
<i>Claytonia perfoliata</i>	33.3	0.8	0.1	0.2	0.2	
<i>Bromus diandrus</i>	33.3	0.8	0.1	0.2	0.2	
<i>Briza maxima</i>	33.3	0.8	0.1	0.2	0.2	
<i>Carduus pycnocephalus</i>	33.3	0.8	0.1	0.2	0.2	
<i>Cirsium vulgare</i>	33.3	0.8	0.1	0.2	0.2	
<i>Marah oreganus</i>	33.3	0.8	0.1	0.2	0.2	
<i>Cortaderia jubata</i>	33.3	0.8	0.1	0.2	0.2	

Non-Vascular

Moss	33.3	33.3	0.1	0.2	0.2	
------	------	------	-----	-----	-----	--

***Eucalyptus (globulus, camaldulensis)* Provisional Semi-natural Association**

Common Name: Eucalyptus Ruderal Forest Woodland

Alliance: *Eucalyptus* spp. – *Ailanthus altissima* – *Robinia pseudoacacia* Woodland
Semi-Natural Alliance

Local Vegetation Description

The Eucalyptus Ruderal Forest Association forms an open to continuous tree canopy with an open to continuous shrub understory. The dominant tree is *Eucalyptus globulus*. Commonly associated shrubs include *Rubus ursinus* and *Toxicodendron diversilobum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	3.4	0 – 15	22.5	15 – 35
Hardwood	51.8	20 – 80	27.5	20 – 35
Regenerating or Shrubby Tree	1.5	0 – 11	10.8	5 – 15
Shrub	30.0	5 – 85	1.5	0 – 5
Herb	15.6	1 – 80	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 105 m, Range 11 – 213 m

Aspect: SW (2), Variable (1)

Slope: Mean 23 degrees, Range 18 – 30 degrees

Macro Topography: Bottom to Lower 1/3 of slope (1), Lower to Middle 1/3 of slope (1), Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 9.0%, Range 2.0 – 20.0%

Litter Cover: Mean 86.7%, Range 75.0 – 93%

Soil Texture (field assessed): Fine silty clay (1), Medium to very fine, loamy sand (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Franciscan melange (2), Sandstone and other sedimentary (2), Volcanic and metavolcanic rocks (2), Granitic (1)

San Mateo County Watersheds: San Francisco Coastal (2), San Mateo Bayside (2), Pacifica (1), Pescadero Creek (1), Tunitas Creek (1)

Site Impacts

This association has greater cover of exotics (average 59.9%) than natives. Non-native species that occur with highest frequency and abundance include *Cortaderia jubata*, *Delairea odorata*, *Ehrharta erecta*, *Eucalyptus globulus*, *Eucalyptus globulus*, *Genista monspessulana*, *Geranium dissectum*, *Oxalis pes-caprae*, and *Sonchus*

Eucalyptus (globulus, camaldulensis) Provisional Semi-natural Association
Eucalyptus spp. – *Ailanthus altissima* – *Robinia pseudoacacia* Woodland Semi-Natural Alliance

asper.

Classification Comments

This association is considered provisional since it is under-sampled in its expected range.

References: AECOM 2013, AIS 2007b, AIS and ESRI 2007, Buck-Diaz et al. 2012, Evens and San 2005, HDR 2014a, Hickson and Keeler-Wolf 2007, Keeler-Wolf and Evens 2006, Keeler-Wolf et al. 2003a, Klein et al. 2007, Klein et al. 2015, Menke et al. 2011, Sproul et al. 2011, Stillwater Sciences 2007a, Thorne et al. 2004, VegCAMP 2005b, VegCAMP 2015a, Verdone and Evens 2010

Global Rarity Rank: GNA

State Rarity Rank: SNA

State Rare: N

Surveys Used for Description

Total: N=8; San Mateo County (n=8): PGA1034, PGA11175, PGA900A, PGA901, PGA903, SMAT0014, SMAT0131, SMAT0174

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Eucalyptus globulus</i>	100.0	87.3	49.5	12	80		Y		Y
	<i>Hesperocyparis macrocarpa</i>	37.5	6.8	3.2	0.2	15				
	<i>Pinus radiata</i>	37.5	3.3	2.1	1	15				
Regenerating or Shrubby Trees	<i>Eucalyptus globulus</i>	25.0	25.0	1.5	1	11				
Shrub	<i>Rubus ursinus</i>	87.5	33.6	18.6	0.2	75			Y	Y
	<i>Toxicodendron diversilobum</i>	50.0	38.8	11.9	5	60				Y
	<i>Frangula californica</i>	37.5	1.3	0.5	0.2	2				
	<i>Genista monspessulana</i>	25.0	7.3	1.0	1	7				
Herb	<i>Heracleum maximum</i>	37.5	10.0	1.5	0.2	10				
	<i>Galium aparine</i>	37.5	5.1	0.9	2	3				
	<i>Delairea odorata</i>	25.0	11.7	2.8	2	20				
	<i>Bromus carinatus</i>	25.0	2.6	0.7	0.2	5				
	<i>Oxalis pes-caprae</i>	25.0	1.3	0.2	0.2	1				

Eucalyptus (globulus, camaldulensis) Provisional Semi-natural Association
Eucalyptus spp. – *Ailanthus altissima* – *Robinia pseudoacacia* Woodland Semi-Natural Alliance

<i>Geranium dissectum</i>	25.0	1.1	0.2	0.2	1
<i>Ehrharta erecta</i>	25.0	1.0	0.2	0.2	1
<i>Scrophularia californica</i>	25.0	0.9	0.3	0.2	2
<i>Cortaderia jubata</i>	25.0	0.4	0.1	0.2	0.2
<i>Sonchus asper</i>	25.0	0.4	0.1	0.2	0.2
<i>Sanicula crassicaulis</i>	25.0	0.4	0.1	0.2	0.2
<i>Polystichum munitum</i>	25.0	0.2	0.1	0.2	0.2

***Hesperocyparis (pigmaea, abramsiana, macrocarpa, goveniana)* Woodland Alliance**



Common Name: California coastal cypress woodland

NVC Alliance Code: A3352. *Hesperocyparis goveniana* - *Hesperocyparis macrocarpa*
Woodland Alliance

Statewide Description

Hesperocyparis abramsiana, *H. goveniana*, *H. macrocarpa*, or *H. pigmaea* dominates or co-dominates in the tree canopy with *Pinus muricata*, *Pinus radiata*, or *Sequoia sempervirens*. Shrubs may include *Arctostaphylos* spp., *Rhododendron macrophyllum*, and *Vaccinium ovatum*.

The four rare species *Hesperocyparis* included in this alliance are restricted to coastal habitats. Due to their similarity of habitat and associates, they are combined here in a single alliance. Because of the rarity of the trees, stands of three of the species were treated as Special Stands rather than Alliances in the 2009 publication of *A Manual of California Vegetation*, second edition. Only stands of *Hesperocyparis pigmaea* were described at the alliance level.

Hesperocyparis abramsiana grows mostly on well-drained ridgelines above the *Sequoia sempervirens* forests on the slopes, canyons, and basins below. Individual trees and groves, both pure and with mixed composition, form a fine vegetation mosaic with other forest and chaparral types, variously described as coastal closed-pine forest, maritime Coast Range ponderosa pine forest, maritime chaparral, mixed chaparral, and mixed evergreen forest.

Hesperocyparis (pigmaea, abramsiana, macrocarpa, goveniana) Woodland Alliance

Local Vegetation Description

The California coastal cypress woodland Alliance forms an open tree canopy with an open to continuous shrub understory. The dominant tree is *Hesperocyparis abramsiana*, and *Quercus wislizeni*, *Arbutus menziesii*, *Pinus attenuata*, and *Pseudotsuga menziesii* are characteristic or often present. Commonly associated shrubs include *Adenostoma fasciculatum*, *Arctostaphylos crustacea*, *Arctostaphylos*

andersonii, *Arctostaphylos sensitiva*, *Arctostaphylos silvicola*, *Ceanothus cuneatus*, *Diplacus aurantiacus*, *Heteromeles arbutifolia*, *Lepechinia calycina*, *Lotus scoparius*, and *Symphoricarpos mollis*, and commonly associated herbs include *Aira caryophyllea*, *Calamagrostis rubescens*, *Castilleja foliolosa*, *Galium californicum*, *Gastridium phleoides*, *Lomatium dasycarpum*, *Nassella lepida*, *Polygala californica*, *Pseudognaphalium canescens* ssp. *beneolens*, *Zigadenus fremontii*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	23.5	23 – 24	7.5	5 – 10
Hardwood	1.6	0.2 – 3	3.5	2 – 5
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	43.0	15 – 71	1.5	1 – 2
Herb	7.0	7 – 7	0.3	0 – 0.5

Local Membership Rule

Hesperocyparis abramsiana dominates on slopes of sandstone or other substrates. *Adenostoma fasciculatum*, *Arctostaphylos* spp., and *Quercus parvula* or *Quercus wislizeni* are commonly found in stands.

Local Environmental Description

Elevation: Mean 484 m, Range 466 – 502 m

Aspect: SE (1), W (1)

Slope: Mean 10 degrees, Range 7 – 12 degrees

Macro Topography: Middle 1/3 of slope (1), Upper 1/3 of slope (1)

Large Rock: Mean 1.0%, Range 1.0 – 1.0%

Small Rock: Mean 0.0%, Range 0.0 – 0.0%

Fines Cover: Mean 8.3%, Range 6.7 – 10.0%

Litter Cover: Mean 44.0%, Range 4.0 – 84%

Soil Texture (field assessed): Coarse, loamy sand (1), Medium to very fine, sandy loam (1)

Geology (field or map data): Sandstone (2)

San Mateo County Watersheds: Pescadero Creek (1)

Other Watersheds, Santa Cruz Co.: Davenport (1)

Site Impacts

Hesperocyparis (pigmaea, abramsiana, macrocarpa, goveniana) Woodland Alliance

This alliance has low non-native plant cover (average 1.9%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira caryophylla* and *Gastroidium phleoides*.

Associations in San Mateo County

- *Hesperocyparis abramsiana* / *Arctostaphylos* (crustacea, silvicola)

Classification Comments

Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: Sawyer et al. 2009

Global Rarity Rank: GNR **State Rarity Rank:** S2

Surveys Used for Description

Total: N=2; San Mateo County (n=1): BUTANO1 Santa Cruz County (n=1): VASE0026

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Hesperocyparis abramsiana</i>	100.0	85.7	21.5	20	23	Y	Y		Y
	<i>Quercus wislizeni</i>	100.0	4.1	1.1	0.2	2	Y			Y
	<i>Pinus attenuata</i>	50.0	6.5	1.5	3	3				Y
	<i>Arbutus menziesii</i>	50.0	1.9	0.5	1	1				Y
	<i>Pseudotsuga menziesii</i>	50.0	1.9	0.5	1	1				Y
Shrub	<i>Adenostoma fasciculatum</i>	100.0	25.7	7.7	7	8.4	Y			Y
	<i>Arctostaphylos crustacea</i>	100.0	13.5	3.1	2.3	4	Y			Y
	<i>Arctostaphylos silvicola</i>	50.0	32.3	35.5	70.9	70.9				Y
	<i>Arctostaphylos sensitiva</i>	50.0	11.8	12.9	25.8	25.8				Y
	<i>Lotus scoparius</i>	50.0	0.8	0.9	1.7	1.7				Y
	<i>Heteromeles arbutifolia</i>	50.0	3.1	0.5	1	1				Y
	<i>Symphoricarpos mollis</i>	50.0	3.1	0.5	1	1				Y
	<i>Lepechinia calycina</i>	50.0	3.1	0.5	1	1				Y
	<i>Ceanothus cuneatus</i>	50.0	3.1	0.5	1	1				Y
	<i>Arctostaphylos andersonii</i>	50.0	3.1	0.5	1	1				Y
	<i>Diplacus aurantiacus</i>	50.0	0.2	0.3	0.5	0.5				Y
Herb	<i>Calamagrostis rubescens</i>	50.0	5.0	0.5	1	1				Y

Hesperocyparis (*pigmaea*, *abramsiana*, *macrocarpa*, *goveniana*) Woodland Alliance

	<i>Zigadenus fremontii</i>	50.0	5.0	0.5	1	1	Y
	<i>Pseudognaphalium canescens ssp. beneolens</i>	50.0	5.0	0.5	1	1	Y
	<i>Polygala californica</i>	50.0	5.0	0.5	1	1	Y
	<i>Nassella lepida</i>	50.0	5.0	0.5	1	1	Y
	<i>Lomatium dasycarpum</i>	50.0	5.0	0.5	1	1	Y
	<i>Galium californicum</i>	50.0	5.0	0.5	1	1	Y
	unknown Apiaceae	50.0	5.0	0.5	1	1	Y
	<i>Aira caryophyllea</i>	50.0	5.0	0.5	1	1	Y
	<i>Gastroidium phleoides</i>	50.0	5.0	0.5	1	1	Y
	<i>Castilleja foliolosa</i>	50.0	50.0	0.1	0.1	0.1	Y
Non-Vascular							
	Lichen	50.0	41.7	2.5	5	5	Y
	Moss	50.0	8.3	0.5	1	1	Y

***Hesperocyparis abramsiana* / *Arctostaphylos (crustacea, silvicola)* Provisional Association**

Common Name: Santa Cruz Cypress / Manzanita Woodland

Alliance: *Hesperocyparis (pigmaea, abramsiana, macrocarpa, goveniana)* Woodland Alliance

Classification Comments

This association is considered provisional since it is under-sampled in its expected range. It is newly described here. The association circumscription is the same as that of the alliance for the county. See above for detailed description.

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree										
	<i>Hesperocyparis abramsiana</i>	100.0	85.7	21.5	20	23		Y		Y
	<i>Quercus wislizeni</i>	100.0	4.1	1.1	0.2	2				Y
	<i>Pinus attenuata</i>	50.0	6.5	1.5	3	3				Y
	<i>Arbutus menziesii</i>	50.0	1.9	0.5	1	1				Y
	<i>Pseudotsuga menziesii</i>	50.0	1.9	0.5	1	1				Y
Shrub										
	<i>Adenostoma fasciculatum</i>	100.0	25.7	7.7	7	8.4				Y
	<i>Arctostaphylos crustacea</i>	100.0	13.5	3.1	2.3	4				Y
	<i>Arctostaphylos silvicola</i>	50.0	32.3	35.5	70.9	70.9				Y
	<i>Arctostaphylos sensitiva</i>	50.0	11.8	12.9	25.8	25.8				Y
	<i>Ceanothus cuneatus</i>	50.0	3.1	0.5	1	1				Y
	<i>Arctostaphylos andersonii</i>	50.0	3.1	0.5	1	1				Y
	<i>Heteromeles arbutifolia</i>	50.0	3.1	0.5	1	1				Y
	<i>Symphoricarpos mollis</i>	50.0	3.1	0.5	1	1				Y
	<i>Lepechinia calycina</i>	50.0	3.1	0.5	1	1				Y
	<i>Lotus scoparius</i>	50.0	0.8	0.9	1.7	1.7				Y
	<i>Diplacus aurantiacus</i>	50.0	0.2	0.3	0.5	0.5				Y
Herb										
	<i>Castilleja foliolosa</i>	50.0	50.0	0.1	0.1	0.1				Y
	<i>Zigadenus fremontii</i>	50.0	5.0	0.5	1	1				Y
	<i>Calamagrostis rubescens</i>	50.0	5.0	0.5	1	1				Y
	<i>Gastridium phleoides</i>	50.0	5.0	0.5	1	1				Y
	<i>Aira caryophyllea</i>	50.0	5.0	0.5	1	1				Y
	<i>Nassella lepida</i>	50.0	5.0	0.5	1	1				Y

Hesperocyparis (pigmaea, abramsiana, macrocarpa, goveniana) Woodland Alliance

	<i>Pseudognaphalium</i>						
	<i>canescens</i> ssp.						Y
	<i>beneolens</i>	50.0	5.0	0.5	1	1	
	<i>Lomatium dasycarpum</i>	50.0	5.0	0.5	1	1	Y
	unknown Apiaceae	50.0	5.0	0.5	1	1	Y
	<i>Galium californicum</i>	50.0	5.0	0.5	1	1	Y
	<i>Polygala californica</i>	50.0	5.0	0.5	1	1	Y
Non-Vascular							
	Lichen	50.0	41.7	2.5	5	5	Y
	Moss	50.0	8.3	0.5	1	1	Y

***Hesperocyparis macrocarpa* – *Pinus radiata* Woodland Semi-Natural Alliance**



Common Name: Monterey cypress – Monterey pine stands

NVC Alliance Code: N/A.

Statewide Description

Hesperocyparis macrocarpa and/or *Pinus radiata* are dominant or co-dominant in the tree canopy. While native groves of these conifers are rare, they both are invasive along the California coast. They have been planted along roads, as hedgerows, and as ornamentals throughout the region, where they continue to spread through natural regeneration.

Local Vegetation Description

The Monterey cypress – Monterey pine stands Alliance forms an open to continuous tree canopy with an open to continuous shrub understory. The dominant tree is *Hesperocyparis macrocarpa*, and *Pinus radiata* are characteristic or often present. Commonly associated shrubs include *Rubus ursinus*, *Toxicodendron diversilobum*, *Baccharis pilularis*, and *Heteromeles arbutifolia*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
-----------------	---------------------------	----------------------------	----------------------------	-----------------------------

Hesperocyparis macrocarpa – *Pinus radiata* Woodland Semi-Natural Alliance

Conifer	49.8	15 – 85	20.0	5 – 35
Hardwood	1.6	0 – 8	12.5	10 – 15
Regenerating or Shrubby Tree	1.0	0 – 3	3.8	0.5 – 10
Shrub	24.9	2 – 90	1.9	0 – 5
Herb	16.6	2 – 55	0.7	0 – 5

Local Membership Rule

Stands dominated or co-dominated by planted or naturalized conifer species including *Hesperocyparis macrocarpa* and/or *Pinus radiata*.

Local Environmental Description

Elevation: Mean 103 m, Range 37 – 306 m

Aspect: SE (3), NW (2), NE (1), SW (1)

Slope: Mean 13 degrees, Range 3 – 25 degrees

Macro Topography: Middle 1/3 of slope (5), Lower 1/3 of slope (1), Lower to Middle 1/3 of slope (1)

Large Rock: Mean 0.1%, Range 0.0 – 1.0%

Small Rock: Mean 0.6%, Range 0.0 – 2.0%

Fines Cover: Mean 17.7%, Range 0.2 – 40.0%

Litter Cover: Mean 71.3%, Range 25.0 – 97%

Soil Texture (field assessed): Medium to very fine, sandy loam (2), Not recorded (2), Loam, (class unknown) (1), Moderately coarse, sandy loam (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Sandstone and other sedimentary (2), Franciscan melange (2), Granitic (1), Granitic (generic) (1), Metamorphic (type unknown) (1), Mixed metamorphic (1)

San Mateo County Watersheds: Pacifica (3), San Mateo Bayside (3), Ano Nuevo (1), San Francisco Coastal (1)

Site Impacts

This alliance has greater cover of exotics than natives, non-native plant cover averages 57.0% relative to native cover. Non-native species that occur with highest frequency and abundance include *Briza maxima*, *Cortaderia jubata*, *Eucalyptus globulus*, *Genista monspessulana*, *Hedera helix*, *Hypochaeris radicata*, *Oxalis pes-caprae*, and *Stellaria media*.

Associations in San Mateo County

- *Hesperocyparis macrocarpa* Ruderal
- *Pinus radiata* plantations

Classification Comments

This alliance was created to encompass stands that are outside the natural range of these two rare species. Native stands of *Pinus radiata* occur in San Mateo County in a limited area around Ano Nuevo, and these are placed in the *Pinus muricata* – *Pinus radiata* Alliance.

References: Buck-Diaz et al. 2020, Klein et al. 2015

Global Rarity Rank: GNA

State Rarity Rank: SNA

Surveys Used for Description

Total: N=8; San Mateo County (n=8): GGNRA367, PGA1764, PGA914, SMAT0009, SMAT0011, SMAT0032, SMAT0059, SMAT0146

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Hesperocyparis macrocarpa</i>	75.0	48.6	31.1	1	85	Y		Y	Y
	<i>Pinus radiata</i>	62.5	36.0	17.8	2	60				Y
	<i>Eucalyptus globulus</i>	25.0	2.6	1.0	0.2	8				
Regenerating or Shrubby Trees	<i>Pinus radiata</i>	37.5	22.4	0.3	0.4	1.2				
	<i>Hesperocyparis macrocarpa</i>	37.5	11.7	0.2	0.2	1				
	<i>Pseudotsuga menziesii</i>	25.0	12.5	0.2	0.2	1				
	<i>Quercus agrifolia</i>	25.0	2.2	0.1	0.2	0.2				
Shrub	<i>Toxicodendron diversilobum</i>	75.0	22.1	8.3	0.2	40	Y			Y
	<i>Rubus ursinus</i>	75.0	10.1	3.6	0.2	20	Y			Y
	<i>Baccharis pilularis</i>	62.5	6.2	4.2	0.2	30				Y
	<i>Heteromeles arbutifolia</i>	50.0	7.6	1.4	0.2	10				Y
	<i>Genista monspessulana</i>	37.5	14.7	3.4	1	19				
	<i>Frangula californica</i>	37.5	9.1	2.8	0.2	20				
	<i>Lonicera hispidula</i>	37.5	3.8	0.8	0.2	6.2				
	<i>Hedera helix</i>	37.5	9.8	0.2	0.2	1				
	<i>Holodiscus discolor</i>	25.0	2.9	0.3	0.2	2				
	<i>Sambucus racemosa</i>	25.0	0.2	0.2	0.2	1				
Herb	<i>unknown Poaceae</i>	50.0	23.3	7.0	0.2	40				Y
	<i>Galium aparine</i>	50.0	12.4	2.2	0.2	15				Y
	<i>Sanicula crassicaulis</i>	50.0	2.0	0.1	0.2	0.2				Y
	<i>Cortaderia jubata</i>	37.5	1.9	0.4	0.2	2				
	<i>Dryopteris arguta</i>	37.5	2.1	0.3	0.2	2				
	<i>Polystichum munitum</i>	37.5	5.6	0.3	0.2	1				
	<i>Oxalis pes-caprae</i>	37.5	1.8	0.2	0.2	1				

Hesperocyparis macrocarpa – *Pinus radiata* Woodland Semi-Natural Alliance

<i>Fragaria vesca</i>	37.5	0.8	0.1	0.2	0.2
<i>Clinopodium douglasii</i>	25.0	4.4	0.5	1	3
<i>Pteridium aquilinum</i>	25.0	4.7	0.4	1	2.2
<i>Marah fabaceus</i>	25.0	1.4	0.3	0.2	2.2
<i>Cynoglossum grande</i>	25.0	0.7	0.1	0.2	0.2
<i>Stellaria media</i>	25.0	0.8	0.1	0.2	0.2
<i>Thalictrum fendleri</i>	25.0	0.7	0.1	0.2	0.2

***Hesperocyparis macrocarpa* Ruderal Provisional Semi-natural Association**

Common Name: Monterey cypress plantations Woodland

Alliance: *Hesperocyparis macrocarpa* – *Pinus radiata* Woodland Semi-Natural Alliance

Local Vegetation Description

The Monterey cypress plantations Association forms an intermittent to continuous tree canopy with an open to intermittent shrub understory. The dominant tree is *Hesperocyparis macrocarpa*, which is often regenerating. Commonly associated shrubs include *Toxicodendron diversilobum*, *Hedera helix*, *Lonicera hispidula*, and *Rubus ursinus*, and commonly associated herbs include *Galium aparine*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	63.0	32 – 85	22.5	10 – 35
Hardwood	3.3	0 – 8	12.5	10 – 15
Regenerating or Shrubby Tree	1.1	0 – 3	7.5	5 – 10
Shrub	13.2	2 – 50	0.6	0 – 1
Herb	17.8	3 – 55	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 138 m, Range 37 – 306 m

Aspect: SE (2), NE (1), NW (1)

Slope: Mean 16 degrees, Range 6 – 25 degrees

Macro Topography: Middle 1/3 of slope (2), Lower 1/3 of slope (1), Lower to Middle 1/3 of slope (1)

Large Rock: Mean 0.3%, Range 0.0 – 1.0%

Small Rock: Mean 0.3%, Range 0.0 – 1.0%

Fines Cover: Mean 10.0%, Range 3.0 – 17.0%

Litter Cover: Mean 71.5%, Range 25.0 – 95%

Soil Texture (field assessed): Medium to very fine, sandy loam (2), Loam, (class unknown) (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Franciscan melange (1), Sandstone and other sedimentary (1), Mixed metamorphic (1), Metamorphic (type unknown) (1), Granitic (1)

San Mateo County Watersheds: San Mateo Bayside (3), Pacifica (2)

Site Impacts

This association has greater cover of exotics than natives (average 59.5% relative to native cover). *Hesperocyparis macrocarpa* is not native to San Mateo County but has been planted there. Other non- native species that occur with highest frequency and abundance include *Eucalyptus globulus*, *Hedera helix*, and *Stellaria media*.

Classification Comments

This association has been revised to include “Ruderal” and placed in a semi-natural alliance to elucidate its occurrence outside of the natural range of this species. The association is considered provisional since it is under-sampled in its expected range.

References: Buck-Diaz et al. 2020, Klein et al. 2015

Global Rarity Rank: GNA

State Rarity Rank: SNA

State Rare: N

Surveys Used for Description

Total: N=5; San Mateo County (n=5): GGNRA367, PGA914, SMAT0009, SMAT0032, SMAT0059

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Hesperocyparis macrocarpa</i>	100.0	77.3	49.6	20	85		Y		Y
	<i>Pinus radiata</i>	40.0	12.7	7.4	2	35				
	<i>Eucalyptus globulus</i>	40.0	4.1	1.6	0.2	8				
Regenerating or Shrubby Trees	<i>Hesperocyparis macrocarpa</i>	60.0	18.7	0.3	0.2	1				Y
	<i>Pseudotsuga menziesii</i>	40.0	20.0	0.2	0.2	1				
Shrub	<i>Toxicodendron diversilobum</i>	80.0	26.2	5.0	0.2	21				Y
	<i>Hedera helix</i>	60.0	15.7	0.3	0.2	1				Y
	<i>Lonicera hispidula</i>	60.0	6.2	1.3	0.2	6.2				Y
	<i>Rubus ursinus</i>	60.0	5.2	0.7	0.2	2				Y
	<i>Frangula californica</i>	40.0	4.7	0.4	0.2	2				
	<i>Holodiscus discolor</i>	40.0	4.7	0.4	0.2	2				
	<i>Heteromeles arbutifolia</i>	40.0	4.6	0.2	0.2	1				
	<i>Baccharis pilularis</i>	40.0	1.3	0.1	0.2	0.2				
Herb	<i>unknown Poaceae</i>	60.0	22.2	8.2	0.2	40				Y
	<i>Galium aparine</i>	60.0	17.0	3.2	0.2	15				Y
	<i>Pteridium aquilinum</i>	40.0	7.5	0.6	1	2.2				
	<i>Clinopodium douglasii</i>	40.0	7.0	0.8	1	3				

Hesperocyparis macrocarpa Ruderal Provisional Semi-natural Association
Hesperocyparis macrocarpa – *Pinus radiata* Woodland Semi-Natural Alliance

<i>Polystichum munitum</i>	40.0	6.0	0.2	0.2	1
<i>Dryopteris arguta</i>	40.0	2.7	0.4	0.2	2
<i>Sanicula crassicaulis</i>	40.0	2.4	0.1	0.2	0.2
<i>Stellaria media</i>	40.0	1.3	0.1	0.2	0.2
<i>Fragaria vesca</i>	40.0	1.1	0.1	0.2	0.2
<i>Thalictrum fendleri</i>	40.0	1.1	0.1	0.2	0.2
<i>Cynoglossum grande</i>	40.0	1.1	0.1	0.2	0.2

***Pinus radiata* plantations Provisional Semi-natural Association**

Common Name: Monterey pine plantations Woodland

Alliance: *Hesperocyparis macrocarpa* – *Pinus radiata* Woodland Semi-Natural Alliance

Local Vegetation Description

The Monterey pine plantations Association forms an open to intermittent tree canopy with an open to continuous shrub understory. The dominant tree is *Pinus radiata*. Commonly associated shrubs include *Baccharis pilularis*, *Rubus ursinus*, and *Toxicodendron diversilobum*, and commonly associated herbs include *Galium aparine*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	36.5	15 – 60	17.5	5 – 35
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 2.6	2.6	0.5 – 5
Shrub	45.8	20 – 90	2.8	0.5 – 5
Herb	15.5	2 – 31	1.1	0 – 5

Local Environmental Description

Elevation: Mean 59 m, Range 37 – 121 m

Aspect: NW (1), SE (1), SW (1)

Slope: Mean 10 degrees, Range 3 – 15 degrees

Macro Topography: Middle 1/3 of slope (3)

Large Rock: 0.0%

Small Rock: Mean 1.0%, Range 0.0 – 2.0%

Fines Cover: Mean 25.4%, Range 0.2 – 40.0%

Litter Cover: Mean 71.0%, Range 56.0 – 97%

Soil Texture (field assessed): Not recorded (2), Moderately coarse, sandy loam (1)

Geology (field or map data): Granitic (generic) (1), Sandstone and other sedimentary (1), Sedimentary (type unknown) (1), Franciscan melange (1)

San Mateo County Watersheds: Ano Nuevo (2), Pacifica (1), San Francisco Coastal (1)

Site Impacts

This association has greater cover of exotics than natives (average 53.9% relative to native cover). *Pinus radiata* is not native to San Mateo County but has been planted there. Other non-native species that occur with highest frequency and abundance include *Avena* spp., *Briza maxima*, *Carduus pycnocephalus*, *Cortaderia jubata*, and *Hypochaeris radicata*.

Classification Comments

This association is considered provisional since it is under-sampled in its expected range.

Pinus radiata plantations Provisional Semi-natural Association
Hesperocyparis macrocarpa – *Pinus radiata* Woodland Semi-Natural Alliance

References: Buck-Diaz et al. 2020, Klein et al. 2015

Global Rarity Rank: GNA

State Rarity Rank: SNA

State Rare: N

Surveys Used for Description

Total: N=4; San Mateo County (n=4): PGA1764, SMAT0011, SMAT0146, SMAT0303

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Pinus radiata</i>	100.0	74.9	35.0	6	60		Y		Y
	<i>Pinus pinea</i>	33.3	24.2	5.3	16	16				
	<i>Hesperocyparis macrocarpa</i>	33.3	0.8	0.3	1	1				
Regenerating or Shrubby Trees	<i>Pinus radiata</i>	66.7	48.7	0.5	0.4	1.2				Y
	<i>Pinus pinea</i>	33.3	15.4	0.4	1.2	1.2				
	<i>Quercus agrifolia</i>	33.3	2.6	0.1	0.2	0.2				
Shrub	<i>Rubus ursinus</i>	100.0	18.3	8.4	0.2	20				Y
	<i>Baccharis pilularis</i>	100.0	14.5	11.1	0.2	30				Y
	<i>Genista monspessulana</i>	66.7	15.5	8.7	7	19				Y
	<i>Toxicodendron diversilobum</i>	66.7	15.3	13.7	1	40				Y
	<i>Heteromeles arbutifolia</i>	66.7	12.7	3.4	0.2	10				Y
	<i>Sambucus racemosa</i>	66.7	0.5	0.4	0.2	1				Y
	<i>Frangula californica</i>	33.3	16.3	6.7	20	20				
	<i>Cotoneaster lacteus</i>	33.3	6.3	1.7	5	5				
	<i>Salix lasiolepis</i>	33.3	0.3	0.1	0.2	0.2				
	<i>Morella californica</i>	33.3	0.2	0.1	0.2	0.2				
<i>Ribes spp.</i>	33.3	0.2	0.1	0.2	0.2					
Herb	<i>Cortaderia jubata</i>	66.7	4.3	0.7	0.2	2				Y
	<i>Oxalis pes-caprae</i>	66.7	2.6	0.4	0.2	1				Y
	<i>Sanicula crassicaulis</i>	66.7	1.3	0.1	0.2	0.2				Y
	<i>Conium maculatum</i>	33.3	33.3	0.7	2	2				

Pinus radiata plantations Provisional Semi-natural Association
Hesperocyparis macrocarpa – *Pinus radiata* Woodland Semi-Natural Alliance

<i>unknown Poaceae</i>	33.3	25.3	5.0	15	15
<i>Briza maxima</i>	33.3	9.5	0.7	2	2
<i>Galium aparine</i>	33.3	4.8	0.3	1	1
<i>Holcus lanatus</i>	33.3	4.8	0.3	1	1
<i>Polystichum munitum</i>	33.3	4.8	0.3	1	1
<i>Vicia sativa</i>	33.3	1.0	0.1	0.2	0.2
<i>Rumex acetosella</i>	33.3	1.0	0.1	0.2	0.2
<i>Avena spp.</i>	33.3	1.0	0.1	0.2	0.2
<i>Carex spp.</i>	33.3	1.0	0.1	0.2	0.2
<i>Dryopteris arguta</i>	33.3	1.0	0.1	0.2	0.2
<i>Marah fabaceus</i>	33.3	1.0	0.1	0.2	0.2
<i>Pentagramma triangularis</i>	33.3	1.0	0.1	0.2	0.2
<i>Stachys bullata</i>	33.3	0.3	0.1	0.2	0.2
<i>Anagallis arvensis</i>	33.3	0.3	0.1	0.2	0.2
<i>Geranium dissectum</i>	33.3	0.3	0.1	0.2	0.2
<i>Fragaria vesca</i>	33.3	0.3	0.1	0.2	0.2
<i>Camissonia ovata</i>	33.3	0.3	0.1	0.2	0.2
<i>Daucus carota</i>	33.3	0.3	0.1	0.2	0.2
<i>Symphotrichum chilense</i>	33.3	0.3	0.1	0.2	0.2
<i>Sisyrinchium bellum</i>	33.3	0.3	0.1	0.2	0.2
Non-Vascular					
Moss	33.3	33.3	0.3	1	1
Lichen	33.3	33.3	0.1	0.2	0.2

***Notholithocarpus densiflorus* Forest Alliance**



Common Name: Tanoak forest

NVC Alliance Code: A3357. *Notholithocarpus densiflorus* - *Arbutus menziesii* Forest Alliance

Statewide Description

Notholithocarpus densiflorus is dominant or co-dominant in the tree canopy with *Acer macrophyllum*, *Alnus rubra*, *Arbutus menziesii*, *Calocedrus decurrens*, *Chamaecyparis lawsoniana*, *Chrysolepis chrysophylla*, *Cornus nuttallii*, *Pinus coulteri*, *Pinus lambertiana*, *Pseudotsuga menziesii*, *Quercus agrifolia*, *Quercus chrysolepis*, *Quercus kelloggii*, *Sequoia sempervirens*, *Torreya californica*, *Tsuga heterophylla*, and *Umbellularia californica*.

Stands of this alliance and others that contain *N. densiflorus* are often referred to as mixed evergreen forest (Sawyer 2006, 2007). Bingham's (1999) study found that stands dominated by *N. densiflorus* differed significantly in species composition and environmental conditions from stands containing a mix of *N. densiflorus* with other evergreens. Cooper's (1922) original concept of the mixed evergreen forest described mixed hardwood stands in the Santa Lucia Mountains. Munz (1959) and Whittaker (1960) expanded the term "mixed evergreen" to include *Pseudotsuga menziesii* – *Notholithocarpus densiflorus* stands. Forest ecologists have used the name "*Lithocarpus densiflorus* series" or "*Notholithocarpus densiflorus* Alliance" to refer to stands that have a low to moderate presence of conifers, such as

Notholithocarpus densiflorus Woodland Alliance

Pseudotsuga menziesii or *Sequoia sempervirens* (e.g., Atzet and Wheeler 1982, Jimerson et al. 1996). The National Vegetation Classification (NVC) places such stands in the *Pseudotsuga menziesii* – *Notholithocarpus densiflorus* or *Sequoia sempervirens* Alliances. Our concept of the *Notholithocarpus densiflorus* Alliance is one with minimal conifer cover and the main cover provided by tanoak with a variable proportion of other hardwoods. The shrub form of *Notholithocarpus densiflorus* (var. *echinoides*) has its own alliance.

Local Vegetation Description

The Tanoak forest Alliance forms an open to continuous tree canopy with a sparse to continuous shrub understory. The dominant tree is *Notholithocarpus densiflorus*, and *Arbutus menziesii*, *Pseudotsuga menziesii*, and *Sequoia sempervirens* are characteristic or often present. Commonly associated shrubs include *Vaccinium ovatum*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	8.0	0 – 30	35.0	10 – 50
Hardwood	66.3	20 – 95	21.3	10 – 35
Regenerating or Shrubby Tree	0.4	0 – 2.6	1.1	0 – 2
Shrub	24.9	0 – 80	2.0	1 – 5
Herb	1.0	0 – 10	0.3	0 – 0.5

Local Membership Rule

Notholithocarpus densiflorus is strongly dominant in the tree canopy or co-occurs with sub-dominant to co-dominant *Arbutus menziesii* or *Umbellularia californica*.

Local Environmental Description

Elevation: Mean 468 m, Range 123 – 698 m

Aspect: SE (2), NW (1), SW (1)

Slope: Mean 18 degrees, Range 11 – 22 degrees

Macro Topography: Upper 1/3 of slope (2), Bottom to Lower 1/3 of slope (1), Ridge top (1)

Large Rock: Mean 1.3%, Range 0.0 – 5.0%

Small Rock: Mean 0.2%, Range 0.0 – 0.4%

Fines Cover: Mean 5.5%, Range 0.0 – 15.0%

Litter Cover: Mean 90.0%, Range 82.0 – 96%

Soil Texture (field assessed): Medium to very fine, loamy sand (2), Medium to very fine, sandy loam (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Shale and other sedimentary (6), Sandstone (3), Mixed alluvium (1)

San Mateo County Watersheds: Palo Alto (6), Ano Nuevo (1), Pescadero Creek (1), San Gregorio Creek (1), San Mateo Bayside (1)

Site Impacts

This alliance has very low non-native plant cover (average 0.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Epipactis helleborine*.

Associations in San Mateo County

- *Notholithocarpus densiflorus* – *Arbutus menziesii*
- *Notholithocarpus densiflorus* / *Vaccinium ovatum*

Classification Comments

None.

References: Evens and Kentner 2006, Jimerson et al. 1996, Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: G4

State Rarity Rank: S3

Surveys Used for Description

Total: N=10; San Mateo County (n=10): PGA1876, PGA1877, PGA790, PGA803, PGA816A, PGA818A, SMAT0186, SMAT0287, SMAT0296, SMAT0684

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Arbutus menziesii</i>	80.0	17.7	16.5	2	55	Y			Y
	<i>Sequoia sempervirens</i>	70.0	5.1	4.5	1	15				Y
	<i>Pseudotsuga menziesii</i>	60.0	4.3	3.4	2	15				Y
Regenerating or Shrubby Trees	<i>Notholithocarpus densiflorus</i>	30.0	26.3	0.3	0.2	2				
	<i>Sequoia sempervirens</i>	20.0	2.2	0.0	0.2	0.2				
Shrub	<i>Vaccinium ovatum</i>	70.0	60.3	20.4	3	80				Y
	<i>Lonicera hispidula</i>	20.0	5.2	0.0	0.2	0.2				
Herb	<i>Pteridium aquilinum</i>	20.0	2.8	0.1	0.2	1				
	<i>Epipactis helleborine</i>	20.0	15.0	0.0	0.2	0.2				
Non-Vascular	Moss	20.0	18.3	1.1	1	10				
	<i>Notholithocarpus densiflorus</i> Woodland Alliance									

Lichen

20.0 11.7 0.0 0.2 0.2

***Notholithocarpus densiflorus* – *Arbutus menziesii* Association**

Common Name: Tanoak – Madrone Woodland

Alliance: *Notholithocarpus densiflorus* Forest Alliance

Local Vegetation Description

The Tanoak – Madrone Association forms an intermittent to continuous tree canopy with an sparse to continuous shrub understory. The dominant tree is *Notholithocarpus densiflorus*, and *Arbutus menziesii*, *Pseudotsuga menziesii*, and *Sequoia sempervirens* are characteristic or often present. Commonly associated shrubs include *Vaccinium ovatum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	10.0	0 – 30	36.5	10 – 50
Hardwood	73.8	53 – 95	22.5	15 – 35
Regenerating or Shrubby Tree	0.7	0 – 2.6	0.9	0 – 2
Shrub	14.8	0 – 80	1.5	1 – 2
Herb	0.0	0 – 0.2	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 512 m, Range 401 – 698 m

Aspect: SE (1), SW (1)

Slope: Mean 20 degrees, Range 19 – 20 degrees

Macro Topography: Upper 1/3 of slope (2)

Large Rock: Mean 0.1%, Range 0.0 – 0.2%

Small Rock: Mean 0.3%, Range 0.2 – 0.4%

Fines Cover: Mean 3.5%, Range 2.0 – 5.0%

Litter Cover: Mean 94.0%, Range 92.0 – 96%

Soil Texture (field assessed): Medium to very fine, sandy loam (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Shale and other sedimentary (4), Sandstone (2)

San Mateo County Watersheds: Palo Alto (4), San Gregorio Creek (1), San Mateo Bayside (1)

Site Impacts

This association has very low non-native plant cover (average 0.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Epipactis helleborine*.

Classification Comments

None.

Notholithocarpus densiflorus – *Arbutus menziesii* Association
Notholithocarpus densiflorus Woodland Alliance

References: Evens and Kentner 2006, Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: G3

State Rarity Rank: S3

State Rare: Y

Surveys Used for Description

Total: N=6; San Mateo County (n=6): PGA1876, PGA1877, PGA790, PGA816A, SMAT0287, SMAT0296

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Notholithocarpus densiflorus</i>	100.0	60.8	51.7	30	95		Y		Y
	<i>Arbutus menziesii</i>	100.0	28.1	26.3	3	55				Y
	<i>Sequoia sempervirens</i>	66.7	5.8	5.7	1	15				Y
	<i>Pseudotsuga menziesii</i>	66.7	5.0	4.5	2	15				Y
Regenerating or Shrubby Trees	<i>Notholithocarpus densiflorus</i>	33.3	27.1	0.5	1.2	2				
	<i>Sequoia sempervirens</i>	33.3	3.7	0.1	0.2	0.2				
Shrub	<i>Vaccinium ovatum</i>	50.0	50.0	14.8	3	80				Y
Herb	<i>Epipactis helleborine</i>	33.3	25.0	0.1	0.2	0.2				
Non-Vascular	Lichen	33.3	19.4	0.1	0.2	0.2				

***Notholithocarpus densiflorus* / *Vaccinium ovatum* Association**

Common Name: Tanoak / Black Huckleberry Woodland

Alliance: *Notholithocarpus densiflorus* Forest Alliance

Local Vegetation Description

The Tanoak / Black Huckleberry Association forms an open to continuous tree canopy with an open to intermittent shrub understory. The dominant tree is *Notholithocarpus densiflorus*, and *Arbutus menziesii* and *Sequoia sempervirens* are characteristic or often present. Commonly associated shrubs include *Vaccinium ovatum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	5.0	0 – 10	27.5	20 – 35
Hardwood	55.0	20 – 85	20.0	10 – 35
Regenerating or Shrubby Tree	0.1	0 – 0.2	01.5	1 – 2
Shrub	40.0	10 – 55	2.5	1 – 5
Herb	2.6	0 – 10	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 401 m, Range 123 – 555 m

Aspect: NW (1), SE (1)

Slope: Mean 17 degrees, Range 11 – 22 degrees

Macro Topography: Bottom to Lower 1/3 of slope (1), Ridge top (1)

Large Rock: Mean 2.5%, Range 0.0 – 5.0%

Small Rock: Mean 0.1%, Range 0.0 – 0.2%

Fines Cover: Mean 7.5%, Range 0.0 – 15.0%

Litter Cover: Mean 86.0%, Range 82.0 – 90%

Soil Texture (field assessed): Medium to very fine, loamy sand (2)

Geology (field or map data): Shale and other sedimentary (2), Sandstone (1), Mixed alluvium (1)

San Mateo County Watersheds: Palo Alto (2), Ano Nuevo (1), Pescadero Creek (1)

Site Impacts

This association has very low non-native plant cover (average 0.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Galium aparine* and *Genista monspessulana*.

Classification Comments

None.

References: Jimerson et al. 1996

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=4; San Mateo County (n=4): PGA803, PGA818A, SMAT0186, SMAT0684

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Notholithocarpus densiflorus</i>	100.0	88.4	55.0	20	85		Y		Y
	<i>Sequoia sempervirens</i>	75.0	4.2	2.8	1	5				Y
	<i>Pseudotsuga menziesii</i>	50.0	3.1	1.8	2	5				Y
	<i>Arbutus menziesii</i>	50.0	2.0	1.8	2	5				Y
	<i>Alnus rhombifolia</i>	25.0	2.3	0.5	2	2				
Regenerating or Shrubby Trees	<i>Notholithocarpus densiflorus</i>	25.0	25.0	0.1	0.2	0.2				
Shrub	<i>Vaccinium ovatum</i>	100.0	75.6	28.8	5	55		Y		Y
	<i>Rhododendron occidentale</i>	25.0	17.4	8.8	35	35				
	<i>Corylus cornuta</i>	25.0	5.0	2.5	10	10				
	<i>Morella californica</i>	25.0	0.5	0.1	0.2	0.2				
	<i>Lonicera hispidula</i>	25.0	0.5	0.1	0.2	0.2				
	<i>Gaultheria shallon</i>	25.0	0.5	0.1	0.2	0.2				
	<i>Frangula californica</i>	25.0	0.5	0.1	0.2	0.2				
	<i>Genista monspessulana</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Symphoricarpos albus</i>	25.0	0.1	0.1	0.2	0.2				
Herb	<i>Pteridium aquilinum</i>	50.0	6.9	0.3	0.2	1				Y
	<i>Carex nudata</i>	25.0	5.7	0.8	3	3				
	<i>Polystichum munitum</i>	25.0	5.7	0.8	3	3				
	<i>Arnica discoidea</i>	25.0	5.0	0.1	0.2	0.2				
	<i>Pleurocospora fimbriolata</i>	25.0	5.0	0.1	0.2	0.2				
	<i>Polygala californica</i>	25.0	5.0	0.1	0.2	0.2				
	<i>Melica torreyana</i>	25.0	5.0	0.1	0.2	0.2				
	<i>Scirpus microcarpus</i>	25.0	3.8	0.5	2	2				

Notholithocarpus densiflorus / *Vaccinium ovatum* Association
Notholithocarpus densiflorus Woodland Alliance

	<i>Equisetum telmateia</i>	25.0	3.8	0.5	2	2
	<i>Woodwardia fimbriata</i>	25.0	1.9	0.3	1	1
	<i>Madia madioides</i>	25.0	0.8	0.1	0.4	0.4
	<i>Maianthemum spp.</i>	25.0	0.4	0.1	0.2	0.2
	<i>Galium aparine</i>	25.0	0.4	0.1	0.2	0.2
	<i>unknown Saxifragaceae</i>	25.0	0.4	0.1	0.2	0.2
	<i>Whipplea modesta</i>	25.0	0.4	0.1	0.2	0.2
Non-Vascular						
	Moss	25.0	25.0	2.5	10	10
	Liverwort	25.0	25.0	0.1	0.2	0.2

***Pinus attenuata* Forest & Woodland Alliance**



Common Name: Knobcone pine forest and woodland

NVC Alliance Code: A3356. *Pinus attenuata* - *Pinus coulteri* - *Pinus sabiniana*
Woodland Alliance

Statewide Description

Pinus attenuata is dominant or co-dominant in the tree canopy with *Arbutus menziesii*, *Juniperus occidentalis*, *Notholithocarpus densiflorus*, *Pinus contorta*, *Pinus coulteri*, *Pinus monticola*, *Pinus radiata*, *Pinus sabiniana*, *Pseudotsuga menziesii*, *Quercus chrysolepis*, and *Quercus wislizeni*.

Stands of *Pinus attenuata* typically occur on nutrient-deficient soils with and without dense understories (Minnich 2007). They tend to vary regionally in size and occurrence; the trees in many stands are dense, forming closed canopies, while in other stands, trees are scattered and canopies are open. Associated vegetation is often chaparral, but in some regions, the surrounding vegetation includes coniferous forests, montane chaparral, and oak woodlands. Individual *Pinus attenuata* trees often emerge through shrub canopies in stands of many chaparral alliances.

Local Vegetation Description

The Knobcone pine forest and woodland Alliance forms an open tree canopy with an open to intermittent shrub understory. The dominant tree is *Pinus attenuata*, and *Pseudotsuga menziesii* and *Quercus chrysolepis* are characteristic or often present.

Pinus attenuata Woodland Alliance

Regenerating or shrubby trees that are often present include *Chrysolepis chrysophylla* var. *minor*. Commonly associated shrubs include *Arctostaphylos crustacea*, *Vaccinium ovatum*, and *Arctostaphylos sensitiva*, and commonly associated herbs include *Lotus junceus*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	15.4	7 – 20	13.5	5 – 20
Hardwood	6.8	3 – 15	9.7	2 – 20
Regenerating or Shrubby Tree	1.9	0 – 7.5	3.3	0.5 – 10
Shrub	36.4	28 – 64	2.0	0.5 – 5
Herb	0.7	0.2 – 2	0.3	0 – 0.5

Local Membership Rule

Pinus attenuata dominates or co-dominates with *Quercus chrysolepis* in the tree overstory, often with moderately dense cover of shrubs such as *Arctostaphylos* spp. and *Vaccinium ovatum* in the understory.

Local Environmental Description

Elevation: Mean 449 m, Range 371 – 552 m

Aspect: SE (3), NW (3), SW (2)

Slope: Mean 14 degrees, Range 2 – 32 degrees

Macro Topography: Upper 1/3 of slope (3), Ridge top (2), Upper 1/3 of slope to Ridgetop (2), Middle 1/3 of slope (1)

Large Rock: Mean 0.3%, Range 0.0 – 1.2%

Small Rock: Mean 17.6%, Range 0.0 – 50%

Fines Cover: Mean 9.5%, Range 1.2 – 31.2%

Litter Cover: Mean 52.1%, Range 3.0 – 93%

Soil Texture (field assessed): Moderately fine sandy clay loam (4), Coarse sand (1), Medium sand (1), Moderately coarse, sandy loam (1), Moderately fine clay loam (1)

Geology (field or map data): Sandstone (3), Siltstone (2), Shale (2), Sandstone and other sedimentary (1)

San Mateo County Watersheds: Ano Nuevo (1), Pescadero Creek (1)

Other Watersheds, Santa Clara Co.: Santa Cruz Mountains (2); **Santa Cruz Co.:** Ano Nuevo (2), Davenport (2)

Site Impacts

This alliance has very low non-native plant cover (average 0.0%) relative to native cover. No non-native species were recorded by the surveyors.

Associations in San Mateo County

- *Pinus attenuata* / *Arctostaphylos (crustacea)*

Classification Comments

Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: Klein et al. 2015.

Global Rarity Rank: G4

State Rarity Rank: S4

Surveys Used for Description

Total: N=8; San Mateo County (n=2): SMAT0236, SMAT0307

Santa Clara County (n=2): SCZCH009, VASE0010

Santa Cruz County (n=4): QV003, SMAT0305, VASE0007, VASE0013

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Pinus attenuata</i>	100.0	57.3	12.2	6	18.4	Y	Y		Y
	<i>Quercus chrysolepis</i>	62.5	21.4	5.4	3	15.4				Y
	<i>Pseudotsuga menziesii</i>	50.0	4.2	1.0	0.1	5				Y
	<i>Quercus wislizeni</i>	37.5	3.8	0.6	0.2	3				
	<i>Sequoia sempervirens</i>	37.5	1.9	0.3	0.6	1				
	<i>Arbutus menziesii</i>	25.0	6.1	0.8	1.8	5				
	<i>Chrysolepis chrysophylla</i> var. <i>chrysophylla</i>	25.0	3.8	0.8	2	4				
Regenerating or Shrubby Trees	<i>Chrysolepis chrysophylla</i> var. <i>minor</i>	50.0	35.7	1.5	0.2	7.5				Y
	<i>Pseudotsuga menziesii</i>	37.5	6.9	0.1	0.2	0.4				
	<i>Quercus wislizeni</i>	25.0	5.1	0.1	0.2	0.4				
	<i>Notholithocarpus densiflorus</i>	25.0	3.3	0.1	0.2	0.2				
Shrub	<i>Arctostaphylos crustacea</i>	100.0	45.8	22.4	5	40.1	Y		Y	Y
	<i>Vaccinium ovatum</i>	75.0	15.7	15.9	0.2	63.3	Y			Y
	<i>Arctostaphylos sensitiva</i>	62.5	30.2	14.8	1	56.1				
	<i>Arctostaphylos</i>	25.0	4.7	5.9	10	37.3				

	<i>andersonii</i>						
Herb	<i>Lotus scoparius</i>	25.0	1.1	0.5	1.6	2.6	
	<i>Lotus junceus</i>	50.0	32.4	0.2	0.2	1	Y
	<i>Pteridium aquilinum</i>	37.5	30.1	0.3	0.1	2	
Non-Vascular							
	Moss	50.0	29.2	0.6	0.2	3	Y
	Lichen	50.0	33.3	0.4	0.2	2	Y

***Pinus attenuata* / *Arctostaphylos (crustacea)* Provisional Association**

Common Name: Knobcone Pine / Manzanita Woodland

Alliance: *Pinus attenuata* Forest & Woodland Alliance

Local Vegetation Description

The Knobcone Pine / Manzanita Association forms an open tree canopy with an open to intermittent shrub understory. The dominant tree is *Pinus attenuata*, and *Pseudotsuga menziesii* and *Quercus chrysolepis* are characteristic or often present. Regenerating or shrubby trees that are often present include *Chrysolepis chrysophylla* var. *minor*. Commonly associated shrubs include *Arctostaphylos crustacea*, *Vaccinium ovatum*, and *Arctostaphylos sensitiva*, and commonly associated herbs include *Lotus junceus*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	17.3	15 – 20	12.5	5 – 20
Hardwood	4.0	3 – 5	7.8	2 – 15
Regenerating or Shrubby Tree	1.5	1.4 – 1.6	1.9	0.5 – 5
Shrub	30.3	28.0 – 33.0	1.7	0.5 – 5
Herb	0.8	0.2 – 2	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 421 m, Range 371 – 495 m

Aspect: NW (1), SE (1), SW (1)

Slope: Mean 22 degrees, Range 9 – 32 degrees

Macro Topography: Upper 1/3 of slope to Ridgetop (2), Upper 1/3 of slope (1)

Large Rock: Mean 0.5%, Range 0.0 – 1.2%

Small Rock: Mean 12.7%, Range 0.2 – 35.0%

Fines Cover: Mean 9.3%, Range 4.0 – 17.0%

Litter Cover: Mean 75.0%, Range 45.0 – 90%

Soil Texture (field assessed): Moderately fine sandy clay loam (2), Coarse sand (1)

Geology (field or map data): Siltstone (2), Sandstone (1)

San Mateo County Watersheds: Ano Nuevo (1), Pescadero Creek (1)

Other Watersheds, Santa Cruz Co.: Ano Nuevo (1)

Site Impacts

This association has very low non-native plant cover (average 0.0%) relative to native cover. No non- natives were recorded by the surveyors.

Classification Comments

Pinus attenuata / *Arctostaphylos (crustacea)* Provisional Association
Pinus attenuata Woodland Alliance

This association is considered provisional since it is under-sampled in its expected range. It is newly described here. Since the number of surveys of this association in San Mateo County is low, data from nearby counties were included.

References: none

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=3; San Mateo County (n=2): SMAT0236, SMAT0307

Santa Cruz County (n=1): SMAT0305

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Pinus attenuata</i>	100.0	57.3	12.2	6	18.4		Y		Y
	<i>Quercus chrysolepis</i>	62.5	21.4	5.4	3	15.4				Y
	<i>Pseudotsuga menziesii</i>	50.0	4.2	1.0	0.1	5				Y
	<i>Quercus wislizeni</i>	37.5	3.8	0.6	0.2	3				
	<i>Sequoia sempervirens</i>	37.5	1.9	0.3	0.6	1				
	<i>Arbutus menziesii</i>	25.0	6.1	0.8	1.8	5				
	<i>Chrysolepis chrysophylla</i> var. <i>chrysophylla</i>	25.0	3.8	0.8	2	4				
	Regenerating or Shrubby Trees	<i>Chrysolepis chrysophylla</i> var. <i>minor</i>	50.0	35.7	1.5	0.2	7.5			
<i>Pseudotsuga menziesii</i>		37.5	6.9	0.1	0.2	0.4				
<i>Quercus wislizeni</i>		25.0	5.1	0.1	0.2	0.4				
<i>Notholithocarpus densiflorus</i>		25.0	3.3	0.1	0.2	0.2				
Shrub	<i>Arctostaphylos crustacea</i>	100.0	45.8	22.4	5	40.1			Y	Y
	<i>Vaccinium ovatum</i>	75.0	15.7	15.9	0.2	63.3				Y
	<i>Arctostaphylos sensitiva</i>	62.5	30.2	14.8	1	56.1				Y
	<i>Arctostaphylos andersonii</i>	25.0	4.7	5.9	10	37.3				

Pinus attenuata / *Arctostaphylos (crustacea)* Provisional Association
Pinus attenuata Woodland Alliance

Herb	<i>Lotus scoparius</i>	25.0	1.1	0.5	1.6	2.6	
	<i>Lotus junceus</i>	50.0	32.4	0.2	0.2	1	Y
	<i>Pteridium aquilinum</i>	37.5	30.1	0.3	0.1	2	
Non-Vascular	Lichen	50.0	33.3	0.4	0.2	2	Y
	Moss	50.0	29.2	0.6	0.2	3	Y

***Pinus muricata* – *Pinus radiata* Forest & Woodland Alliance**



Common Name: Bishop pine – Monterey pine Forest and Woodland

NVC Alliance Code: A4097. *Pinus muricata* - *Pinus radiata* Woodland Alliance

Statewide Description

Pinus muricata or *Pinus radiata* is dominant or co-dominant in the tree canopy with *Abies grandis*, *Acer macrophyllum*, *Alnus rhombifolia*, *Arbutus menziesii*, *Hesperocyparis goveniana*, *Hesperocyparis pigmaea*, *Notholithocarpus densiflorus*, *Pinus attenuata*, *Pinus contorta* ssp. *bolanderi*, *Pinus contorta* ssp. *contorta*, *Pinus muricata*, *Pinus radiata*, *Pseudotsuga menziesii*, *Quercus agrifolia*, *Quercus tomentella*, *Quercus wislizeni*, *Salix lasiolepis*, *Salix scouleriana*, *Sequoia sempervirens*, *Tsuga heterophylla* or *Umbellularia californica*.

Pinus muricata grows on the mainland from Santa Barbara to Humboldt Cos., as well as on the Santa Cruz and Santa Rosa islands (Barbour 2007). It grows in areas with spring and summer fog, which is important to its survival (Cope 1993e). Chaparral surrounds stands in the La Purisima Hills that occur on diatomaceous mudstone (Cole 1980, Vogl et al. 1977), in the hills north of La Honda Canyon (Schmalzer et al. 1988) in Santa Barbara Co., and near Erendira in Baja California. Stands on the Channel Islands differ in species composition from one another and from those on the mainland (Philbrick and Haller 1977). In Humboldt and Mendocino Cos., *P. muricata* commonly occurs on shallow, poorly drained soils and mixes with *Hesperocyparis pigmaea*, *P. contorta*, *Pseudotsuga menziesii*, and *Sequoia sempervirens* (Westman and Whittaker 1975).

Pinus radiata is a fast-growing conifer that attains a height of 15-35 m and an age of 80-100 years. Trees produce cones at 5-10 years of age. Cones are generally serotinous

Pinus muricata - *Pinus radiata* Forest & Woodland Alliance

and open after a fire or on hot days. Trees have intermediate shade tolerance. Mainland trees grow on very windy, foggy slopes in the coastal marine layer. Trees exist in desert scrub on Cedros Island (McDonald and Laacke 1990). *Pinus radiata* is a rare CNPS list 1B.1 plant.

Local Vegetation Description

The Bishop pine – Monterey pine Alliance forms an open tree canopy with an intermittent shrub understory in the single sample available. The dominant tree is *Pinus radiata*. Other tree species present at low cover are *Hesperocyparis macrocarpa* and *Quercus agrifolia*. Commonly associated shrubs include *Rubus ursinus*, *Toxicodendron diversilobum*, *Ceanothus thyrsiflorus*, and *Heteromeles arbutifolia*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	31	NA	27.5	20 – 35
Hardwood	0	NA	no data	no data
Regenerating or Shrubby Tree	0.4	NA	3.5	2 – 5
Shrub	48	NA	3.5	2 – 5
Herb	31	NA	0.3	0 – 0.5

Local Membership Rule

Naturally occurring stands of *Pinus radiata* or *Pinus muricata* dominant, co-dominant with conifers, or subdominant to hardwoods in the tree overstory and/or regenerating tree layer. The understory may include moderate to dense cover of shrubs such as *Arctostaphylos* spp., *Baccharis pilularis*, *Gaultheria shallon*, *Toxicodendron diversilobum* and *Vaccinium ovatum*. Most stands of Monterey Pine in San Mateo County are planted or naturalized except for a limited area between Ano Nuevo and Santa Cruz County.

Local Environmental Description

Elevation: 38 m

Aspect: SE (1)

Slope: 12 degrees

Macro Topography: Middle 1/3 of slope (1)

Large Rock: 0%

Small Rock: 1%

Fines Cover: 36%

Litter Cover: 60%

Soil Texture (field assessed): Not recorded (1)

Geology (field or map data): Sandstone and other sedimentary (1)

San Mateo County Watersheds: Ano Nuevo (1)

Site Impacts

This alliance has moderate non-native plant cover (average 28.0%) relative to native cover. Non-native species that occur with highest frequency and abundance include

Briza maxima, *Cynosurus echinatus*, and *Hesperocyparis macrocarpa*.

Associations in San Mateo County

- *Pinus radiata* / *Toxicodendron diversilobum*

Classification Comments

Native stands of *Pinus radiata* occur in San Mateo County in a limited area around Ano Nuevo.

References: Cylinder 1995, McBride and Stone 1976

Global Rarity Rank: G3 **State Rarity Rank:** S3

Surveys Used for Description

Total: N=1; **San Mateo County (n=1):** SMAT0303

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Pinus radiata</i>	100.0	96.8	30.0	30	30	Y	Y		Y
	<i>Hesperocyparis macrocarpa</i>	100.0	3.2	1.0	1	1	Y			Y
Regenerating or Shrubby Trees	<i>Pinus radiata</i>	100.0	50.0	0.2	0.2	0.2	Y	Y		Y
	<i>Quercus agrifolia</i>	100.0	50.0	0.2	0.2	0.2	Y	Y		Y
Shrub	<i>Rubus ursinus</i>	100.0	51.2	25.0	25	25	Y	Y		Y
	<i>Toxicodendron diversilobum</i>	100.0	41.0	20.0	20	20	Y		Y	Y
	<i>Ceanothus thyrsiflorus</i>	100.0	4.1	2.0	2	2	Y			Y
	<i>Heteromeles arbutifolia</i>	100.0	2.0	1.0	1	1	Y			Y
	<i>Baccharis pilularis</i>	100.0	0.4	0.2	0.2	0.2	Y			Y
	<i>Diplacus aurantiacus</i>	100.0	0.4	0.2	0.2	0.2	Y			Y
	<i>Frangula californica</i>	100.0	0.4	0.2	0.2	0.2	Y			Y
	<i>Lonicera hispidula</i>	100.0	0.4	0.2	0.2	0.2	Y			Y
Herb	<i>Briza maxima</i>	100.0	62.9	20.0	20	20	Y	Y		Y
	<i>Cynosurus echinatus</i>	100.0	31.4	10.0	10	10	Y		Y	Y

Pinus muricata - *Pinus radiata* Forest & Woodland Alliance

	<i>Marah fabaceus</i>	100.0	3.1	1.0	1	1	Y		Y
	<i>Scrophularia californica</i>	100.0	0.6	0.2	0.2	0.2	Y		Y
	<i>Hypochaeris radicata</i>	100.0	0.6	0.2	0.2	0.2	Y		Y
	<i>Carduus pycnocephalus</i>	100.0	0.6	0.2	0.2	0.2	Y		Y
	<i>Eriophyllum stoechadifolium</i>	100.0	0.6	0.2	0.2	0.2	Y		Y
Non-Vascular									
	<i>Lichen</i>	100.0	100.0	0.2	0.2	0.2	Y	Y	Y

***Pinus radiata* / *Toxicodendron diversilobum* Association**

Common Name: Monterey Pine / Poison Oak Woodland

Alliance: *Pinus muricata* – *Pinus radiata* Forest & Woodland Alliance

Classification Comments

The association circumscription is the same as that of the alliance for the county. See above for detailed description.

References: Cylinder 1995

Global Rarity Rank: G1

State Rarity Rank: S1

State Rare: Y

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Pinus radiata</i>	100.0	96.8	30.0	30	30		Y		Y
	<i>Hesperocyparis macrocarpa</i>	100.0	3.2	1.0	1	1				Y
Regenerating or Shrubby Trees	<i>Quercus agrifolia</i>	100.0	50.0	0.2	0.2	0.2		Y		Y
	<i>Pinus radiata</i>	100.0	50.0	0.2	0.2	0.2		Y		Y
Shrub	<i>Rubus ursinus</i>	100.0	51.2	25.0	25	25		Y		Y
	<i>Toxicodendron diversilobum</i>	100.0	41.0	20.0	20	20			Y	Y
	<i>Ceanothus thyrsiflorus</i>	100.0	4.1	2.0	2	2				Y
	<i>Heteromeles arbutifolia</i>	100.0	2.0	1.0	1	1				Y
	<i>Diplacus aurantiacus</i>	100.0	0.4	0.2	0.2	0.2				Y
	<i>Frangula californica</i>	100.0	0.4	0.2	0.2	0.2				Y
	<i>Lonicera hispidula</i>	100.0	0.4	0.2	0.2	0.2				Y
	<i>Baccharis pilularis</i>	100.0	0.4	0.2	0.2	0.2				Y
Herb	<i>Briza maxima</i>	100.0	62.9	20.0	20	20		Y		Y
	<i>Cynosurus echinatus</i>	100.0	31.4	10.0	10	10			Y	Y
	<i>Marah fabaceus</i>	100.0	3.1	1.0	1	1				Y
	<i>Scrophularia californica</i>	100.0	0.6	0.2	0.2	0.2				Y
	<i>Hypochaeris radicata</i>	100.0	0.6	0.2	0.2	0.2				Y

	<i>Eriophyllum</i>							
	<i>stoechadifolium</i>	100.0	0.6	0.2	0.2	0.2		Y
	<i>Carduus pycnocephalus</i>	100.0	0.6	0.2	0.2	0.2		Y
Non-Vascular								
	Lichen	100.0	100.0	0.2	0.2	0.2	Y	Y

***Platanus racemosa* – *Quercus agrifolia* Woodland Alliance**



Common Name: California sycamore – coast live oak riparian woodlands
NVC Alliance Code: A3750. *Platanus racemosa* - *Quercus agrifolia* - *Juglans californica* Riparian Woodland Alliance

Statewide Description

Platanus racemosa and/or *Quercus agrifolia* is dominant or co-dominant in the tree canopy in riparian habitats with *Alnus rhombifolia*, *Juglans californica*, *Populus fremontii*, *Quercus lobata*, *Salix exigua*, *Salix gooddingii*, *Salix laevigata*, *Salix lasiolepis*, *Salix lutea*, *Schinus molle*, and *Umbellularia californica*.

This alliance includes *Platanus racemosa* woodlands whose status and distribution throughout California were summarized by Keeler-Wolf et al. (1997). We have also included stands of co-dominant *P. racemosa* and *Populus fremontii* within this alliance, though Klein and Evens (2005) placed these stands in a separate *Platanus racemosa*-*Populus fremontii* alliance. In addition, this alliance has been expanded since the 2009 publication, *A Manual of California Vegetation, second edition*, to include riparian stands dominated by *Quercus agrifolia*. Upland stands of *Q. agrifolia* remain in the *Quercus agrifolia* Alliance.

Local Vegetation Description

The California sycamore – coast live oak riparian woodlands Alliance forms an open to intermittent tree canopy with an open to intermittent shrub understory. The dominant tree is *Quercus agrifolia*. Commonly associated shrubs include *Toxicodendron diversilobum*,

Platanus racemosa – *Quercus agrifolia* Woodland Alliance

and commonly associated herbs include *Bromus diandrus* and *Lolium perenne*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	42.5	30 – 55	12.5	10 – 15
Regenerating or Shrubby Tree	29.5	0 – 88.4	no data	no data
Shrub	25.5	16.0 – 35.0	3.5	2 – 5
Herb	30.0	20 – 40	0.5	0 – 1

Local Membership Rule

Quercus agrifolia dominates in a riparian setting, often with *Salix* spp. and *Toxicodendron diversilobum*.

Local Environmental Description

Elevation: Mean 103 m, Range 14 – 189 m

Aspect: NW (1), SW (1)

Slope: Mean 18 degrees, Range 16 – 19 degrees

Macro Topography: Middle 1/3 of slope (1), Middle to Upper 1/3 of slope (1)

Large Rock: Mean 0.0%, Range 0.0 – 0.0%

Small Rock: Mean 0.0%, Range 0.0 – 0.0%

Fines Cover: Mean 0.0%, Range 0.0 – 0.0%

Litter Cover: Mean 42.5%, Range 0.0 – 85%

Soil Texture (field assessed): Fine silty clay (1), Medium to very fine, sandy loam (1)

Geology (field or map data): Serpentine (1), Sandstone and other sedimentary (1), Alluvium (1)

San Mateo County Watersheds: San Mateo Bayside (1)

Other Watersheds, Marin Co.: Bolinas (1); **Santa Clara Co.:** Coyote Creek (1)

Site Impacts

This alliance has moderate non-native plant cover (average 20.5%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Bromus diandrus*, *Bromus hordeaceus*, *Centaurea solstitialis*, *Cytisus scoparius*, *Epipactis helleborine*, *Genista monspessulana*, *Hordeum murinum*, *Lactuca serriola*, *Polypogon monspeliensis*, *Rubus armeniacus*, *Rumex crispus*, and *Solanum physalifolium*.

Associations in San Mateo County

- *Quercus agrifolia* / *Salix lasiolepis*

Classification Comments

Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: AECOM 2013, Evens and San 2005, Hickson and Keeler-Wolf 2007, Keeler-Wolf and Evens 2006, Klein and Evens 2005, Sproul et al. 2011

Global Rarity Rank: G3

State Rarity Rank: S3

Surveys Used for Description

Total: N=3; San Mateo County (n=1): GGNRA317

Marin County (n=1): PGA8153

Santa Clara County (n=1): SCLAR069

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	100.0	96.9	28.0	5	50	Y	Y		Y
	<i>Quercus lobata</i>	33.3	3.1	1.0	3	3				Y
Regenerating or Shrubby Trees	<i>Quercus agrifolia</i>	33.3	24.6	21.7	65.2	65.2				
	<i>Salix gooddingii</i>	33.3	8.7	7.7	23	23				
	<i>Malus fusca</i>	33.3	0.1	0.1	0.2	0.2				
Shrub	<i>Toxicodendron diversilobum</i>	100.0	18.3	2.1	0.2	5	Y			Y
	<i>Rubus armeniacus</i>	33.3	15.6	5.3	16	16				
	<i>Frangula californica</i>	33.3	20.6	3.3	10	10				
	<i>Cytisus scoparius</i>	33.3	9.7	3.3	10	10				
	<i>Salix lasiolepis</i>	33.3	7.8	2.7	8	8				
	<i>Rubus ursinus</i>	33.3	16.0	1.7	5	5				
	<i>Salvia mellifera</i>	33.3	10.3	1.7	5	5				
	<i>Genista monspessulana</i>	33.3	0.6	0.1	0.2	0.2				
	<i>Diplacus aurantiacus</i>	33.3	0.4	0.1	0.2	0.2				
	<i>Baccharis pilularis</i>	33.3	0.6	0.1	0.2	0.2				
Herb	<i>Lolium perenne</i>	66.7	32.4	6.0	8	10				Y
	<i>Bromus diandrus</i>	66.7	9.2	2.0	1	5				Y
	<i>Equisetum arvense</i>	33.3	7.3	1.7	5.2	5.2				
	<i>Bromus hordeaceus</i>	33.3	7.1	1.7	5	5				
	<i>Epipactis helleborine</i>	33.3	20.8	0.3	1	1				
	<i>Platanus racemosa</i> – <i>Quercus agrifolia</i> Woodland Alliance									

<i>Elymus glaucus</i>	33.3	2.1	0.3	1	1
<i>Stachys pycnantha</i>	33.3	2.1	0.3	1	1
<i>Polypogon monspeliensis</i>	33.3	0.4	0.1	0.2	0.2
<i>Polypogon interruptus</i>	33.3	0.4	0.1	0.2	0.2
<i>Nassella pulchra</i>	33.3	0.4	0.1	0.2	0.2
<i>Rumex crispus</i>	33.3	0.3	0.1	0.2	0.2
<i>Solidago spp.</i>	33.3	0.4	0.1	0.2	0.2
<i>Solanum physalifolium</i>	33.3	4.2	0.1	0.2	0.2
<i>Verbena lasiostachys</i>	33.3	0.4	0.1	0.2	0.2
<i>Sonchus spp.</i>	33.3	0.4	0.1	0.2	0.2
<i>Achillea millefolium</i>	33.3	0.4	0.1	0.2	0.2
<i>Juncus patens</i>	33.3	4.2	0.1	0.2	0.2
<i>Juncus arcticus</i>	33.3	0.4	0.1	0.2	0.2
<i>Iris douglasiana</i>	33.3	4.2	0.1	0.2	0.2
<i>Hordeum murinum</i>	33.3	0.4	0.1	0.2	0.2
<i>Eschscholzia californica</i>	33.3	0.4	0.1	0.2	0.2
<i>Cyperus spp.</i>	33.3	0.3	0.1	0.2	0.2
<i>Centaurea solstitialis</i>	33.3	0.4	0.1	0.2	0.2
<i>Carex serratodens</i>	33.3	0.4	0.1	0.2	0.2
<i>Lactuca serriola</i>	33.3	0.4	0.1	0.2	0.2
<i>Avena spp.</i>	33.3	0.4	0.1	0.2	0.2

***Quercus agrifolia* / *Salix lasiolepis* Association**

Common Name: Coast Live Oak / Arroyo Willow Woodland

Alliance: *Platanus racemosa* – *Quercus agrifolia* Woodland Alliance

Local Vegetation Description

The Coast Live Oak / Arroyo Willow Association forms an open to continuous tree canopy with an open shrub understory. The dominant tree is *Quercus agrifolia*, and *Quercus lobata* is often present.

Regenerating or shrubby trees that are often present include *Malus fusca*, *Quercus agrifolia*, and *Salix gooddingii*. Commonly associated shrubs include *Toxicodendron diversilobum*, *Baccharis pilularis*, *Diplacus aurantiacus*, *Frangula californica*, *Genista monspessulana*, *Rubus ursinus*, and *Salvia mellifera*, and commonly associated herbs include *Achillea millefolium*, *Avena* spp., *Bromus diandrus*, *Carex serratodens*, *Centaurea solstitialis*, *Elymus glaucus*, *Epipactis helleborine*, *Eschscholzia californica*, *Hordeum murinum*, *Iris douglasiana*, *Juncus arcticus*, *Juncus patens*, *Lactuca serriola*, *Lolium perenne* ssp. *multiflorum*, *Nassella pulchra*, *Polypogon interruptus*, *Polypogon monspeliensis*, *Solanum physalifolium*, *Solidago* spp., *Sonchus* spp., *Stachys pycnantha*, and *Verbena lasiostachys*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	17.5	5 – 30	12.5	10 – 15
Regenerating or Shrubby Tree	44.2	0 – 88.4	no data	no data
Shrub	13.0	10.0 – 16.0	3.5	2 – 5
Herb	11.0	2 – 20	0.8	0.5 – 1

Local Environmental Description

Elevation: Mean 148 m, Range 106 – 189 m

Aspect: NW (1), SW (1)

Slope: Mean 18 degrees, Range 16 – 19 degrees

Macro Topography: Middle 1/3 of slope (1), Middle to Upper 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: 0.0%

Litter Cover: Mean 42.5%, Range 0.0 – 85%

Soil Texture (field assessed): Fine silty clay (1), Medium to very fine, sandy loam (1)

Geology (field or map data): Sandstone and other sedimentary (1), Serpentine (1)

San Mateo County Watersheds: San Mateo Bayside (1)

Other Watersheds, Santa Clara Co.: Coyote Creek (1)

Quercus agrifolia / *Salix lasiolepis* Association
Platanus racemosa – *Quercus agrifolia* Woodland Alliance

Site Impacts

This association has low non-native plant cover (average 10.2%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Epipactis helleborine*, *Genista monspessulana*, *Lolium perenne*, and *Malus fusca*.

Classification Comments

Since the number of surveys of this association in San Mateo County is low, data from nearby counties were included.

References: AECOM 2013, Evens and San 2005, Hickson and Keeler-Wolf 2007, Keeler-Wolf and Evens 2006, Klein and Evens 2005, Reyes et al. 2020, Sproul et al. 2011

Global Rarity Rank: G3 **State Rarity Rank:** S3 **State Rare:** Y

Surveys Used for Description

Total: N=2; San Mateo County (n=1): GGNRA317

Santa Clara County (n=1): SCLAR069

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	100.0	96.9	28.0	5	50		Y		Y
	<i>Quercus lobata</i>	33.3	3.1	1.0	3	3				Y
Regenerating or Shrubby Trees	<i>Quercus agrifolia</i>	33.3	24.6	21.7	65.2	65.2				
	<i>Salix gooddingii</i>	33.3	8.7	7.7	23	23				
	<i>Malus fusca</i>	33.3	0.1	0.1	0.2	0.2				
Shrub	<i>Toxicodendron diversilobum</i>	100.0	18.3	2.1	0.2	5				Y
	<i>Frangula californica</i>	33.3	20.6	3.3	10	10				
	<i>Rubus ursinus</i>	33.3	16.0	1.7	5	5				
	<i>Rubus armeniacus</i>	33.3	15.6	5.3	16	16				
	<i>Salvia mellifera</i>	33.3	10.3	1.7	5	5				
	<i>Cytisus scoparius</i>	33.3	9.7	3.3	10	10				
	<i>Salix lasiolepis</i>	33.3	7.8	2.7	8	8				

Quercus agrifolia / *Salix lasiolepis* Association
Platanus racemosa – *Quercus agrifolia* Woodland Alliance

Herb	<i>Genista monspessulana</i>	33.3	0.6	0.1	0.2	0.2	
	<i>Baccharis pilularis</i>	33.3	0.6	0.1	0.2	0.2	
	<i>Diplacus aurantiacus</i>	33.3	0.4	0.1	0.2	0.2	
	<i>Lolium perenne</i>	66.7	32.4	6.0	8	10	Y
	<i>Bromus diandrus</i>	66.7	9.2	2.0	1	5	Y
	<i>Epipactis helleborine</i>	33.3	20.8	0.3	1	1	
	<i>Equisetum arvense</i>	33.3	7.3	1.7	5.2	5.2	
	<i>Bromus hordeaceus</i>	33.3	7.1	1.7	5	5	
	<i>Solanum physalifolium</i>	33.3	4.2	0.1	0.2	0.2	
	<i>Iris douglasiana</i>	33.3	4.2	0.1	0.2	0.2	
	<i>Juncus patens</i>	33.3	4.2	0.1	0.2	0.2	
	<i>Stachys pycnantha</i>	33.3	2.1	0.3	1	1	
	<i>Elymus glaucus</i>	33.3	2.1	0.3	1	1	
	<i>Hordeum murinum</i>	33.3	0.4	0.1	0.2	0.2	
	<i>Eschscholzia californica</i>	33.3	0.4	0.1	0.2	0.2	
	<i>Solidago spp.</i>	33.3	0.4	0.1	0.2	0.2	
	<i>Polypogon monspeliensis</i>	33.3	0.4	0.1	0.2	0.2	
	<i>Polypogon interruptus</i>	33.3	0.4	0.1	0.2	0.2	
	<i>Nassella pulchra</i>	33.3	0.4	0.1	0.2	0.2	
	<i>Lactuca serriola</i>	33.3	0.4	0.1	0.2	0.2	
	<i>Juncus arcticus</i>	33.3	0.4	0.1	0.2	0.2	
	<i>Centaurea solstitialis</i>	33.3	0.4	0.1	0.2	0.2	
	<i>Carex serratodens</i>	33.3	0.4	0.1	0.2	0.2	
	<i>Avena spp.</i>	33.3	0.4	0.1	0.2	0.2	
	<i>Achillea millefolium</i>	33.3	0.4	0.1	0.2	0.2	
	<i>Sonchus spp.</i>	33.3	0.4	0.1	0.2	0.2	
	<i>Verbena lasiostachys</i>	33.3	0.4	0.1	0.2	0.2	
	<i>Rumex crispus</i>	33.3	0.3	0.1	0.2	0.2	
	<i>Cyperus spp.</i>	33.3	0.3	0.1	0.2	0.2	

***Populus fremontii* –
Fraxinus velutina – *Salix***

Populus fremontii is

hindsii × *regia*, *Platanus racemosa*, *Quercus agrifolia*, *Salix exigua*,



***gooddingii* Forest &
Woodland Alliance**

Common Name: Fremont cottonwood forest and woodland

NVC Alliance Code: A3803.

Populus fremontii -
Fraxinus velutina -
Salix gooddingii
Riparian Forest & Woodland Alliance

Statewide Description

Populus fremontii – *Fraxinus velutina* – *Salix gooddingii* Woodland Alliance

dominant or co-dominant in the tree canopy with *Acer negundo*, *Baccharis sergiloides*, *Fraxinus latifolia*, *Fraxinus velutina*, *Juglans hindsii*, *Juglans*

Salix gooddingii, *Salix laevigata*, *Salix lasiolepis*, *Salix lucida* ssp. *lasiandra* and *Salix lutea*.

Populus fremontii is a common plant at lower elevations, but most stands have endured negative impacts from reduced water availability (through groundwater pumping), livestock use, hydrologic alterations and irrigation schemes, competition from non-native plants, direct habitat destruction, and other human activities.

Populus fremontii may dominate stands or mix

with other trees in riparian settings. Some uncertainty exists about the proper classification of mixed stands of *P. fremontii* and *Salix gooddingii*. Vaghti (2003) places these in the *P. fremontii* alliance; Hickson and Keeler-Wolf (2007), in a larger survey from the Sacramento Delta, suggest they are better placed in the *Salix gooddingii* alliance. Furthermore, uncertainty exists about mixed stands of *P. fremontii* and *Platanus racemosa*. Klein and Evens (2005) and Evens and San (2005) place co-dominant stands in a mixed alliance, but we place them in the *Platanus racemosa* alliance. *Populus fremontii* also occurs in mixed stands with additional co-dominant species in southern California, including *S. laevigata* and other willows (*S. lucida* and *S. lasiolepis*), *Quercus agrifolia*, and *Juglans californica* (Klein and Evens 2005, Stillwater Sciences and URS 2007).

Local Vegetation Description

The Fremont cottonwood forest and woodland Alliance forms a continuous tree canopy with an intermittent shrub understory in the single sample available. The single survey is from the grounds of Filoli Historic House & Garden, and may have been planted. The dominant tree is *Populus fremontii*.

Commonly associated shrubs include *Rubus ursinus*, *Baccharis salicifolia*, *Frangula californica*, *Ribes menziesii*, *Salix lasiolepis*, and *Toxicodendron diversilobum*, and commonly associated herbs include *Trillium ovatum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	NA	no data	no data
Hardwood	90.0	NA	no data	no data
Regenerating or Shrubby Tree	0.0	NA	no data	no data
Shrub	65.0	NA	no data	no data
Herb	0.2	NA	no data	no data

Local Membership Rule

Populus fremontii dominates or co-dominates with *Acer negundo*, *Juglans*, and/or *Salix*, sometimes with *Populus* having as little as 5% absolute cover. If *Juglans hindsii* is dominant, but *Populus* has at least 20% relative cover in the tree layer, key to this alliance.

Local Environmental Description

Elevation: 105 m

Aspect: no data

Slope: no data

Macro Topography no data

Large Rock: no data

Small Rock: no data

Fines Cover: no data

Litter Cover: no data

Soil Texture (field assessed): no data

Populus fremontii – *Fraxinus velutina* – *Salix gooddingii* Woodland Alliance

Geology (field or map data): Sandstone and other sedimentary (1)

San Mateo County Watersheds: San Mateo Bayside (1)

Site Impacts

This alliance has very low non-native plant cover (average 0.0%) relative to native cover. No non-native species were recorded by the surveyors.

Associations in San Mateo County

- *Populus fremontii* / *Baccharis salicifolia*

Classification Comments

None.

References: Buck-Diaz and Evens 2011a, Buck-Diaz et al. 2012, CNPS Vegetation Program 2015, Evens and San 2005, Kittel et al. 2012, Klein and Evens 2005, Sproul et al. 2011, Stillwater Sciences and URS 2007

Global Rarity Rank: G4

State Rarity Rank: S3

Surveys Used for Description

Total: N=1; San Mateo County (n=1): PGA766D

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Populus fremontii</i>	100.0	100.0	80.0	80	80		Y		Y
Shrub	<i>Rubus ursinus</i>	100.0	46.4	35.0	35	35	Y		Y	Y
	<i>Baccharis salicifolia</i>	100.0	19.9	15.0	15	15	Y			Y
	<i>Frangula californica</i>	100.0	19.9	15.0	15	15	Y			Y
	<i>Salix lasiolepis</i>	100.0	13.3	10.0	10	10	Y			Y
	<i>Ribes menziesii</i>	100.0	0.3	0.2	0.2	0.2	Y			Y
	<i>Toxicodendron diversilobum</i>	100.0	0.3	0.2	0.2	0.2	Y			Y
Herb	<i>Trillium ovatum</i>	100.0	100.0	0.2	0.2	0.2	Y	Y		Y

Populus fremontii / Baccharis salicifolia Association

Common Name: Fremont Cottonwood / Mulefat Woodland

Alliance: *Populus fremontii* – *Fraxinus velutina* – *Salix gooddingii* Forest & Woodland Alliance

Classification Comments

The association circumscription is the same as that of the alliance for the county. See above for detailed description.

References: Buck-Diaz et al. 2012, Buck and Evens 2011a, CNPS Vegetation Program 2015, Evens and San 2005, Kittel et al. 2012, Klein and Evens 2005, Sproul et al. 2011, Stillwater and URS 2007

Global Rarity Rank: G2

State Rarity Rank: SNR

State Rare: Y

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Populus fremontii</i>	100.0	100.0	80.0	80	80		Y		Y
Shrub	<i>Rubus ursinus</i>	100.0	46.4	35.0	35	35			Y	Y
	<i>Baccharis salicifolia</i>	100.0	19.9	15.0	15	15				Y
	<i>Frangula californica</i>	100.0	19.9	15.0	15	15				Y
	<i>Salix lasiolepis</i>	100.0	13.3	10.0	10	10				Y
	<i>Toxicodendron diversilobum</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Ribes menziesii</i>	100.0	0.3	0.2	0.2	0.2				Y
Herb	<i>Trillium ovatum</i>	100.0	100.0	0.2	0.2	0.2		Y		Y

***Populus trichocarpa* Forest & Woodland Alliance**



Common Name: Black cottonwood forest and woodland

NVC Alliance Code: A3743. *Fraxinus latifolia* - *Populus balsamifera* ssp. *trichocarpa* - *Alnus* spp. Riparian Forest Alliance

Statewide Description

Populus trichocarpa is dominant or co-dominant in the tree canopy with *Abies concolor*, *Acer macrophyllum*, *Acer negundo*, *Alnus incana*, *Alnus rhombifolia*, *Alnus rubra*, *Fraxinus latifolia*, *Juniperus occidentalis*, *Morella californica*, *Pinus contorta* ssp. *murrayana*, *Pinus jeffreyi*, *Platanus racemosa*, *Populus fremontii*, *Populus tremuloides*, *Quercus agrifolia*, *Salix exigua*, *Salix hookeriana*, *Salix laevigata*, *Salix lasiolepis*, *Salix lucida* ssp. *lasiandra*, *Salix lutea* and *Salix scouleriana*.

The alliance in California occurs primarily in montane elevations and outer coastal regions, and it is largely lacking in the warm deserts and the Central Valley. A similar pattern occurs on a more local scale within the Santa Clara River watershed in Ventura County, where *Populus trichocarpa* stands are common along the river near the coast where summer fog is frequent; further inland (about 30 km from the coast), where hotter summer conditions prevail, they are replaced by stands of *P. fremontii*. However, *P. trichocarpa* stands also occur at mid to high elevations in the watershed along tributary streams, such as Sespe Creek (Stillwater Sciences and URS 2007, Stillwater Sciences 2007a). The largest low- elevation stands occur along the Eel River in Humboldt Co. In the Modoc region, this alliance occurs along persistent streams and

stands may be co-dominated by *P. tremuloides* (VegCAMP 2020). Typically, montane stands are small and widely dispersed. Stands are seasonally or intermittently flooded during winter floods and spring runoff. Moisture varies during the dry season, but despite dropping water tables in summer, soils can remain moist due to capillary action (Potter 2005).

Local Vegetation Description

The Black cottonwood forest and woodland Alliance forms an open to continuous tree canopy with an open to intermittent shrub understory. The dominant tree is *Populus trichocarpa*, and *Alnus rubra*, *Acer macrophyllum*, *Acer negundo*, *Salix lasiandra*, and *Umbellularia californica* are characteristic or often present. Regenerating or shrubby trees that are dominant and characteristic include *Populus trichocarpa*, and those that are often present include *Acer macrophyllum*, *Alnus rubra*, *Salix lasiandra*, and *Sequoia sempervirens*. Commonly associated shrubs include *Cornus sericea*, *Rubus ursinus*, *Salix lasiolepis*, *Sambucus racemosa*, and *Symphoricarpos albus*, and commonly associated herbs include *Stachys bullata*, *Artemisia douglasiana*, *Calystegia purpurata*, *Conium maculatum*, *Delairea odorata*, *Ehrharta erecta*, *Equisetum* spp., *Equisetum telmateia*, *Geranium dissectum*, *Marah fabaceus*, *Scirpus microcarpus*, *Scrophularia californica*, *Urtica dioica*, and *Veronica americana*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	
Hardwood	53.0	26 – 80	15.0	10 – 20
Regenerating or Shrubby Tree	1.4	0.4 – 2.4	2.5	1 – 5
Shrub	38.5	17 – 60	2.5	1 – 5
Herb	15.0	6 – 24	0.9	0 – 2

Local Membership Rule

Populus trichocarpa dominates or co-dominates with *Alnus rubra* in the tree overstory. Stands for this type will often have other riparian trees present. A variety of shrubs and herbs may be found in the understory, including *Cornus sericea*, *Rubus ursinus*, *Salix lasiolepis*, and *Stachys bullata*.

Local Environmental Description

Elevation: Mean 37 m, Range 13 – 61 m

Aspect: Flat (1), SW (1)

Slope: Mean 4 degrees, Range 0 – 8 degrees

Macro Topography: Bottom (1), Bottom to Lower 1/3 of slope (1)

Large Rock: Mean 0.0%, Range 0.0 – 0.0%

Small Rock: Mean 0.0%, Range 0.0 – 0.0%

Fines Cover: Mean 7.5%, Range 5.0 – 10.0%

Litter Cover: Mean 89.5%, Range 87.0 – 92%

Soil Texture (field assessed): Coarse, loamy sand (1), Unknown (1)

Geology (field or map data): Alluvium (1), Mixed alluvium (1)

Populus trichocarpa Woodland Alliance

San Mateo County Watersheds: Pescadero Creek (1), San Gregorio Creek (1)

Site Impacts

This alliance has low non-native plant cover (average 3.8%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Conium maculatum*, *Delairea odorata*, *Ehrharta erecta*, and *Geranium dissectum*.

Associations in San Mateo County

- *Populus trichocarpa* / *Cornus sericea* / *Carex obnupta*

Classification Comments

None.

References: Sawyer et al. 2009

Global Rarity Rank: G5

State Rarity Rank: S3

Surveys Used for Description

Total: N=2; San Mateo County (n=2): SMAT0181, SMAT0239

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Populus trichocarpa</i>	100.0	66.0	37.5	15	60	Y	Y		Y
	<i>Alnus rubra</i>	100.0	23.9	13.0	6	20	Y			Y
	<i>Acer macrophyllum</i>	50.0	5.7	1.5	3	3				Y
	<i>Acer negundo</i>	50.0	3.8	1.0	2	2				Y
	<i>Umbellularia californica</i>	50.0	0.4	0.1	0.2	0.2				Y
	<i>Salix lasiandra</i>	50.0	0.1	0.1	0.2	0.2				Y
Regenerating or Shrubby Trees	<i>Populus trichocarpa</i>	100.0	45.8	0.6	0.2	1	Y		Y	Y
	<i>Salix lasiandra</i>	50.0	20.8	0.5	1	1				Y
	<i>Acer macrophyllum</i>	50.0	25.0	0.1	0.2	0.2				Y
	<i>Alnus rubra</i>	50.0	4.2	0.1	0.2	0.2				Y
	<i>Sequoia sempervirens</i>	50.0	4.2	0.1	0.2	0.2				Y

Shrub

Populus trichocarpa Woodland Alliance

	<i>Cornus sericea</i>	100.0	48.6	28.0	1	55	Y	Y	Y
	<i>Rubus ursinus</i>	100.0	43.9	8.0	1	15	Y	Y	Y
	<i>Salix lasiolepis</i>	100.0	4.5	2.2	0.4	4	Y		Y
	<i>Sambucus racemosa</i>	50.0	2.9	0.5	1	1			Y
	<i>Symphoricarpos albus</i>	50.0	0.2	0.1	0.2	0.2			Y
Herb									
	<i>Stachys bullata</i>	100.0	31.7	5.5	1	10	Y	Y	Y
	<i>Delairea odorata</i>	50.0	14.2	3.5	7	7			Y
	<i>Urtica dioica</i>	50.0	6.1	1.5	3	3			Y
	<i>Conium maculatum</i>	50.0	4.1	1.0	2	2			Y
	<i>Scrophularia californica</i>	50.0	11.4	0.5	1	1			Y
	<i>Artemisia douglasiana</i>	50.0	2.0	0.5	1	1			Y
	<i>Equisetum telmateia</i>	50.0	11.4	0.5	1	1			Y
	<i>Scirpus microcarpus</i>	50.0	11.4	0.5	1	1			Y
	<i>Marah fabaceus</i>	50.0	2.0	0.5	1	1			Y
	<i>Veronica americana</i>	50.0	2.3	0.1	0.2	0.2			Y
	<i>Equisetum spp.</i>	50.0	0.4	0.1	0.2	0.2			Y
	<i>Calystegia purpurata</i>	50.0	0.4	0.1	0.2	0.2			Y
	<i>Ehrharta erecta</i>	50.0	0.4	0.1	0.2	0.2			Y
	<i>Geranium dissectum</i>	50.0	2.3	0.1	0.2	0.2			Y
Non-Vascular									
	Lichen	50.0	25.0	0.1	0.2	0.2			Y
	Moss	50.0	25.0	0.1	0.2	0.2			Y

***Populus trichocarpa* / *Cornus sericea* / *Carex obnupta* Provisional Association**

Common Name: Black Cottonwood – Red Osier/ Slough Sedge Woodland

Alliance: *Populus trichocarpa* Forest & Woodland Alliance

Classification Comments

The association circumscription is the same as that of the alliance for the county. See above for detailed description. This association definition was adopted from a NatureServe description for Oregon and Washington. It is considered provisional since it is under-sampled in its expected range.

References: NatureServe 2020

Global Rarity Rank: G2

State Rarity Rank: SNR

State Rare: Y

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Populus trichocarpa</i>	100.0	66.0	37.5	15	60		Y		Y
	<i>Alnus rubra</i>	100.0	23.9	13.0	6	20				Y
	<i>Acer macrophyllum</i>	50.0	5.7	1.5	3	3				Y
	<i>Acer negundo</i>	50.0	3.8	1.0	2	2				Y
	<i>Umbellularia californica</i>	50.0	0.4	0.1	0.2	0.2				Y
	<i>Salix lasiandra</i>	50.0	0.1	0.1	0.2	0.2				Y
Regenerating or Shrubby Trees	<i>Populus trichocarpa</i>	100.0	45.8	0.6	0.2	1			Y	Y
	<i>Acer macrophyllum</i>	50.0	25.0	0.1	0.2	0.2				Y
	<i>Salix lasiandra</i>	50.0	20.8	0.5	1	1				Y
	<i>Sequoia sempervirens</i>	50.0	4.2	0.1	0.2	0.2				Y
	<i>Alnus rubra</i>	50.0	4.2	0.1	0.2	0.2				Y
Shrub	<i>Cornus sericea</i>	100.0	48.6	28.0	1	55			Y	Y
	<i>Rubus ursinus</i>	100.0	43.9	8.0	1	15			Y	Y
	<i>Salix lasiolepis</i>	100.0	4.5	2.2	0.4	4				Y

	<i>Sambucus racemosa</i>	50.0	2.9	0.5	1	1		Y
	<i>Symphoricarpos albus</i>	50.0	0.2	0.1	0.2	0.2		Y
Herb								
	<i>Stachys bullata</i>	100.0	31.7	5.5	1	10	Y	Y
	<i>Delairea odorata</i>	50.0	14.2	3.5	7	7		Y
	<i>Scirpus microcarpus</i>	50.0	11.4	0.5	1	1		Y
	<i>Scrophularia californica</i>	50.0	11.4	0.5	1	1		Y
	<i>Equisetum telmateia</i>	50.0	11.4	0.5	1	1		Y
	<i>Urtica dioica</i>	50.0	6.1	1.5	3	3		Y
	<i>Conium maculatum</i>	50.0	4.1	1.0	2	2		Y
	<i>Veronica americana</i>	50.0	2.3	0.1	0.2	0.2		Y
	<i>Geranium dissectum</i>	50.0	2.3	0.1	0.2	0.2		Y
	<i>Marah fabaceus</i>	50.0	2.0	0.5	1	1		Y
	<i>Artemisia douglasiana</i>	50.0	2.0	0.5	1	1		Y
	<i>Calystegia purpurata</i>	50.0	0.4	0.1	0.2	0.2		Y
	<i>Ehrharta erecta</i>	50.0	0.4	0.1	0.2	0.2		Y
	<i>Equisetum spp.</i>	50.0	0.4	0.1	0.2	0.2		Y
Non-Vascular								
	Lichen	50.0	25.0	0.1	0.2	0.2		Y
	Moss	50.0	25.0	0.1	0.2	0.2		Y

***Pseudotsuga menziesii* – (Notholithocarpus densiflorus – Arbutus menziesii) Forest & Woodland Alliance**



Common Name: Douglas fir – (Tanok – Madrone) Forest and Woodland

NVC Alliance Code: A0106. *Pseudotsuga menziesii* - *Notholithocarpus densiflorus* Forest Alliance

Statewide Description

Pseudotsuga menziesii is dominant or co-dominant in the tree canopy with *Acer macrophyllum*, *Alnus rhombifolia*, *Arbutus menziesii*, *Chamaecyparis lawsoniana*, *Chrysolepis chrysophylla*, *Cornus nuttallii*, *Notholithocarpus densiflorus*, *Quercus agrifolia*, *Quercus chrysolepis*, *Quercus garryana*, *Quercus kelloggii*, and *Sequoia sempervirens*.

The ecological literature applies the term “Douglas fir forest” to stands of varying species composition (Fites-Kaufman et al. 2007, Sawyer 2006, 2007). Bingham (1999) developed a region-wide alliance-level classification for late-seral-stage forests based on relationships between species composition and major environmental gradients. Stands dominated by *Pseudotsuga menziesii* segregated significantly from other alliances. However, upon reinterpretation of data, *P. menziesii* is often mixed with other conifers in the montane zone. This complex relationship between *Pseudotsuga menziesii* and other conifers and hardwoods throughout northern California has led to the recognition of two other alliances, defined by the combinations of co-dominants: *Abies concolor* – *Pseudotsuga menziesii* Alliance and *Pinus ponderosa* – *Calocedrus decurrens* – *Pseudotsuga menziesii* Alliance. Other combinations, such as in the case

Pseudotsuga menziesii – (*Notholithocarpus densiflorus* – *Arbutus menziesii*) Forest & Woodland Alliance

of *Pseudotsuga menziesii* – *Quercus chrysolepis* Association and *Pseudotsuga menziesii* – *Notholithocarpus densiflorus* associations, are included in this *Pseudotsuga menziesii* – (*Notholithocarpus densiflorus* – *Arbutus menziesii*) Alliance, such as in the North and Central Coast.

Local Vegetation Description

The Douglas fir forest and woodland Alliance forms an open to continuous tree canopy with a sparse to continuous shrub understory. The dominant tree is *Pseudotsuga menziesii*. Commonly associated shrubs include *Rubus ursinus*, *Toxicodendron diversilobum*, and *Frangula californica*, and commonly associated herbs include *Polystichum munitum*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	37.6	5 – 98	29.4	5 – 50
Hardwood	22.4	0 – 65	14.4	2 – 35
Regenerating or Shrubby Tree	3.1	0 – 46	2.4	1 – 5
Shrub	34.7	1 – 90	2.2	0 – 5
Herb	18.1	0 – 92	0.3	0 – 2

Local Membership Rule

Pseudotsuga menziesii is dominant or is co-dominant with *Arbutus menziesii*, *Quercus agrifolia*, *Q. chrysolepis*, *Notholithocarpus densiflorus*, or *Umbellularia californica*. Stands sampled in San Mateo County within 5-10 km of the coast.

Local Environmental Description

Elevation: Mean 375 m, Range 92 – 669 m

Aspect: SE (7), NW (6), SW (5), NE (4), Variable (1)

Slope: Mean 18 degrees, Range 7 – 33 degrees

Macro Topography: Upper 1/3 of slope (10), Middle 1/3 of slope (4), Ridge top (3), Middle to Upper 1/3 of slope (3), Not recorded (2), Lower 1/3 of slope (1)

Large Rock: Mean 0.3%, Range 0.0 – 3.0%

Fines Cover: Mean 17.0%, Range 0 – 70.0%

Small Rock: Mean 1.8%, Range 0.0 – 28.0%

Litter Cover: Mean 66.4%, Range 0 – 100%

Soil Texture (field assessed): Medium to very fine, sandy loam (5), Not recorded (3), Moderately fine silty clay loam (3), Moderately coarse, sandy loam (3), Coarse, loamy sand (3), Moderately fine clay loam (2), Medium sand (2), Medium silt (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Granitic (12), Sandstone and other sedimentary (11), Sandstone (9), Shale and other sedimentary (6), Franciscan melange (6), Sandstone, shale, and conglomerate (3), Volcanic and metavolcanic rocks (3), Metamorphic (type unknown) (1), Shale (1)

San Mateo County Watersheds: Half Moon Bay (14), San Mateo Bayside (12), Pescadero Creek (9), Pacifica (6), Palo Alto (4), San Gregorio Creek (4), Ano Nuevo (3)

Site Impacts

This alliance has low non-native plant cover (average 6.0%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Myosotis latifolia*.

Associations in San Mateo County

- *Pseudotsuga menziesii* – (*Umbellularia californica*) / *Frangula californica*
- *Pseudotsuga menziesii* – *Arbutus menziesii*
- *Pseudotsuga menziesii* – *Chrysolepis chrysophylla* – *Notholithocarpus densiflorus*
- *Pseudotsuga menziesii* – *Notholithocarpus densiflorus* / *Vaccinium ovatum*
- *Pseudotsuga menziesii* – *Quercus agrifolia*
- *Pseudotsuga menziesii* – *Quercus chrysolepis*
- *Pseudotsuga menziesii* – *Umbellularia californica* / (*Toxicodendron diversilobum*)
- *Pseudotsuga menziesii* – *Umbellularia californica* / *Polystichum munitum*
- *Pseudotsuga menziesii* / (*Toxicodendron diversilobum*)
- *Pseudotsuga menziesii* / *Baccharis pilularis*
- *Pseudotsuga menziesii* / *Corylus cornuta* / *Polystichum munitum*

Classification Comments

This alliance has been newly defined and merges two previously existing alliances, *Pseudotsuga menziesii* plus *Pseudotsuga menziesii* – *Notholithocarpus densiflorus*.

References: Evens and Kentner 2006, Jimerson et al. 1995, Jimerson et al. 1996, Keeler-Wolf et al. 2003a, Keeler-Wolf et al. 2003b, Klein et al. 2007, Klein et al. 2015, Laidlaw-Holmes 1981, Sawyer and Stillman 1977, Simpson 1980, Stuart et al. 1992, Stuart et al. 1996, Taylor and Teare 1979b, Wainwright and Barbour 1984

Global Rarity Rank: G5

State Rarity Rank: S4

Surveys Used for Description

Total: N=55; San Mateo County (n=55): BOPO317A, CLOV138, GGNRA318, GGNRA330, GGNRA335, GGNRA338, GGNRA356, GGNRA378, GGNRA381, PGA1001, PGA1005, PGA1022, PGA1045, PGA1045A, PGA11475, PGA11944, PGA11991, PGA12003, PGA12041, PGA12173, PGA12176, PGA12292, PGA12295, PGA12312, PGA12364, PGA1827, PGA1870, PGA1873, PGA725, PGA736, PGA750, PGA763, PGA791, PGA805, PGA987, PWDFR01A, PWDFR03A, SMAT0027, SMAT0050, SMAT0052, SMAT0152, SMAT0214, SMAT0232, SMAT0237, SMAT0263, SMAT0280, SMAT0288, SMAT0291, SMAT0293,

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Pseudotsuga menziesii</i>	98.2	64.0	35.5	5	98	Y	Y		Y
	<i>Quercus agrifolia</i>	45.5	9.6	5.6	0.2	58				
	<i>Arbutus menziesii</i>	40.0	5.5	3.2	0.2	35				
	<i>Notholithocarpus densiflorus</i>	36.4	5.7	4.1	0.2	40				
	<i>Umbellularia californica</i>	32.7	4.1	2.6	0.2	20				
Regenerating or Shrubby Trees	<i>Pseudotsuga menziesii</i>	25.5	10.9	0.9	0.2	20				
Shrub	<i>Rubus ursinus</i>	83.6	23.9	8.8	0.2	40	Y			Y
	<i>Toxicodendron diversilobum</i>	78.2	14.6	7.2	0.2	60	Y			Y
	<i>Frangula californica</i>	54.5	9.0	4.0	0.2	50				Y
	<i>Lonicera hispidula</i>	47.3	3.5	0.5	0.2	5				
	<i>Vaccinium ovatum</i>	30.9	9.7	2.5	0.2	70				
	<i>Baccharis pilularis</i>	27.3	9.3	4.1	0.2	40				
	<i>Sambucus racemosa</i>	27.3	5.1	2.7	0.2	35				
	<i>Heteromeles arbutifolia</i>	23.6	2.8	1.1	0.2	25				
	<i>Diplacus aurantiacus</i>	21.8	1.0	0.4	0.2	10				
	<i>Holodiscus discolor</i>	20.0	1.0	0.5	0.2	15				
Herb	<i>Polystichum munitum</i>	58.2	19.8	5.2	0.2	50				Y
	<i>Dryopteris arguta</i>	47.3	8.8	1.7	0.2	15				
	<i>Pteridium aquilinum</i>	30.9	8.2	1.0	0.2	20				
	<i>Marah fabaceus</i>	30.9	2.1	0.7	0.2	18.2				
	<i>Urtica dioica</i>	27.3	5.2	2.2	0.2	35				
	<i>Galium aparine</i>	27.3	0.7	0.5	0.2	25				
	<i>Clinopodium douglasii</i>	25.5	3.3	0.1	0.2	2				
	<i>Stachys ajugoides</i>	23.6	2.2	1.0	0.2	30				
	<i>Myosotis latifolia</i>	21.8	2.7	1.5	0.2	45				
Non-Vascular	Moss	25.5	18.8	0.9	0.2	30				

***Pseudotsuga menziesii* – (*Umbellularia californica*) / *Frangula californica* Association**

Common Name: Douglas-fir – California Bay / California Coffeeberry Woodland

Alliance: *Pseudotsuga menziesii* – (*Notholithocarpus densiflorus* – *Arbutus menziesii*)
Forest & Woodland Alliance

Local Vegetation Description

The Douglas-fir – California Bay / California Coffeeberry Association forms an intermittent tree canopy with an intermittent to continuous shrub understory. The dominant tree is *Pseudotsuga menziesii*, and *Umbellularia californica* is characteristically present. Commonly associated shrubs include *Frangula californica*, *Rubus ursinus*, *Toxicodendron diversilobum*, and *Baccharis pilularis*, and commonly associated herbs include *Polystichum munitum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	50.0	35 – 65	no data	no data
Hardwood	1.5	0 – 3	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	67.5	45 – 90	3.5	2 – 5
Herb	12.5	0 – 25	no data	no data

Local Environmental Description

Elevation: Mean 459 m, Range 400 – 518 m **Aspect:** no data

Slope: no data

Macro Topography: no data

Large Rock: no data

Small Rock: no data

Fines Cover: no data

Litter Cover: no data

Soil Texture (field assessed): no data

Geology (field or map data): Granitic (2)

San Mateo County Watersheds: Half Moon Bay (1), Pacifica (1)

Site Impacts

This association has very low non-native plant cover (average 0.0%) relative to native cover. No non-natives were recorded by the surveyors.

Classification Comments

This association was formerly placed in the *Pseudotsuga menziesii* Alliance.

References: Keeler-Wolf et al. 2003a

Global Rarity Rank: G4

State Rarity Rank: S4?

State Rare: N

Surveys Used for Description

Total: N=2; San Mateo County (n=2): PGA1022, PGA12364

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree										
	<i>Pseudotsuga menziesii</i>	100.0	95.7	50.0	35	65		Y		Y
	<i>Umbellularia californica</i>	100.0	4.1	1.6	0.2	3				Y
	<i>Notholithocarpus densiflorus</i>	50.0	0.2	0.1	0.2	0.2				Y
Shrub										
	<i>Frangula californica</i>	100.0	32.6	27.5	20	35			Y	Y
	<i>Rubus ursinus</i>	100.0	21.7	17.5	15	20				Y
	<i>Toxicodendron diversilobum</i>	100.0	8.8	10.1	0.2	20				Y
	<i>Sambucus racemosa</i>	100.0	5.6	4.5	4	5				Y
	<i>Ribes sanguineum</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Baccharis pilularis</i>	50.0	15.7	9.0	18	18				Y
	<i>Ceanothus thyrsiflorus</i>	50.0	15.1	17.5	35	35				Y
	<i>Holodiscus discolor</i>	50.0	0.1	0.1	0.2	0.2				Y
Herb										
	<i>Polystichum munitum</i>	100.0	91.1	12.6	0.2	25		Y		Y
	<i>Urtica dioica</i>	50.0	8.2	2.5	5	5				Y
	<i>Artemisia douglasiana</i>	50.0	0.3	0.1	0.2	0.2				Y
	<i>Scrophularia californica</i>	50.0	0.3	0.1	0.2	0.2				Y

Pseudotsuga menziesii – Arbutus menziesii Association

Common Name: Douglas-fir / Madrone Woodland

Alliance: *Pseudotsuga menziesii* – (*Notholithocarpus densiflorus* – *Arbutus menziesii*)
Forest & Woodland Alliance

Local Vegetation Description

The Douglas-fir / Madrone Association forms an intermittent to continuous tree canopy with an open to intermittent shrub understory. The dominant tree is *Arbutus menziesii* and *Pseudotsuga menziesii*. Commonly associated shrubs include *Lonicera hispidula* and *Toxicodendron diversilobum*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	33.3	20 – 55	13.8	5 – 20
Hardwood	35.0	20 – 55	18.8	10 – 35
Regenerating or Shrubby Tree	13.0	0 – 46	1.5	1 – 2
Shrub	19.7	5 – 35	1.7	0 – 5
Herb	5.4	0.2 – 15	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 469 m, Range 331 – 558 m

Aspect: NE (1), SE (1)

Slope: Mean 11 degrees, Range 10 – 12 degrees

Macro Topography: Ridge top (1), Upper 1/3 of slope (1)

Large Rock: Mean 0.3%, Range 0.0 – 0.6%

Small Rock: 0.0%

Fines Cover: Mean 8.0%, Range 8.0 – 8.0%

Litter Cover: Mean 95.0%, Range 90.0 – 100%

Soil Texture (field assessed): Medium to very fine, sandy loam (1), Moderately coarse, sandy loam (1)

Geology (field or map data): Shale and other sedimentary (1), Sandstone (1),
Sandstone and other sedimentary (1)

San Mateo County Watersheds: Ano Nuevo (1), Half Moon Bay (1), San Mateo Bayside (1)

Site Impacts

This association has very low non-native plant cover (average 0.0%) relative to native cover. No non-natives were recorded by the surveyors.

Classification Comments

This association was formerly placed in the *Pseudotsuga menziesii* Alliance.

References: Klein et al. 2015, Laidlaw-Holmes 1981, Sawyer and Stillman 1977

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=4; San Mateo County (n=4): GGNRA330, PGA12041, PGA1870, SMAT0232

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Pseudotsuga menziesii</i>	100.0	51.7	31.3	20	55		Y		Y
	<i>Arbutus menziesii</i>	100.0	41.9	25.0	15	35			Y	Y
	<i>Notholithocarpus densiflorus</i>	50.0	3.2	2.6	0.2	10				Y
	<i>Quercus agrifolia</i>	25.0	3.1	2.5	10	10				
	<i>Pinus attenuata</i>	25.0	0.1	0.1	0.2	0.2				
	Regenerating or Shrubby Trees	<i>Quercus wislizeni</i>	50.0	40.6	10.0	5	35			
<i>Umbellularia californica</i>		25.0	6.0	2.8	11	11				
<i>Pseudotsuga menziesii</i>		25.0	1.7	0.1	0.4	0.4				
<i>Arbutus menziesii</i>		25.0	0.9	0.1	0.2	0.2				
<i>Quercus kelloggii</i>		25.0	0.9	0.1	0.2	0.2				
Shrub	<i>Toxicodendron diversilobum</i>	75.0	15.1	2.5	2	5				Y
	<i>Rubus ursinus</i>	75.0	14.1	5.1	0.2	20				Y
	<i>Lonicera hispidula</i>	75.0	11.6	1.9	0.4	5				Y
	<i>Vaccinium ovatum</i>	50.0	12.4	2.3	3	6				Y
	<i>Frangula californica</i>	50.0	9.8	1.3	2	3				Y
	<i>Rosa californica</i>	50.0	1.0	0.1	0.2	0.2				Y
	<i>Arctostaphylos hookeri</i>	25.0	16.8	4.0	16	16				
	<i>Arctostaphylos andersonii</i>	25.0	13.9	2.0	8	8				
	Shrub (>.5m)	25.0	2.0	0.8	3	3				

Pseudotsuga menziesii – *Arbutus menziesii* Association

Pseudotsuga menziesii – (*Notholithocarpus densiflorus* – *Arbutus menziesii*) Forest & Woodland Alliance

	<i>Frangula purshiana</i>	25.0	1.1	0.3	1	1	
	<i>Heteromeles arbutifolia</i>	25.0	1.1	0.3	1	1	
	<i>Symphoricarpos spp.</i>	25.0	0.8	0.1	0.2	0.2	
	<i>Arctostaphylos crustacea</i>	25.0	0.3	0.1	0.2	0.2	
Herb							
	<i>Polystichum munitum</i>	50.0	9.5	1.3	0.2	5	Y
	<i>Galium californicum</i>	25.0	25.0	0.1	0.2	0.2	
	<i>Pteridium aquilinum</i>	25.0	22.7	1.0	4	4	
	<i>unknown Poaceae</i>	25.0	11.7	1.8	7	7	
	<i>Iris spp.</i>	25.0	11.4	0.3	1	1	
	<i>Cynoglossum grande</i>	25.0	11.4	0.3	1	1	
	<i>Elymus californicus</i>	25.0	5.0	0.8	3	3	
	<i>Maianthemum spp.</i>	25.0	2.3	0.1	0.2	0.2	
	<i>Dryopteris arguta</i>	25.0	1.1	0.1	0.2	0.2	
Non-Vascular							
	Lichen	25.0	12.5	0.1	0.2	0.2	
	Moss	25.0	12.5	0.1	0.2	0.2	

***Pseudotsuga menziesii* – *Chrysolepis chrysophylla* – *Notholithocarpus densiflorus* Association**

Common Name: Douglas-fir – Chinquapin – Tanoak Woodland

Alliance: *Pseudotsuga menziesii* – (*Notholithocarpus densiflorus* – *Arbutus menziesii*)
Forest & Woodland Alliance

Local Vegetation Description

The Douglas-fir – Chinquapin – Tanoak Association forms an open to continuous tree canopy with an open shrub understory. The dominant tree is *Chrysolepis chrysophylla* var. *chrysophylla*, and *Pseudotsuga menziesii* is co-dominant. *Notholithocarpus densiflorus* is always present, often in the regenerating layer. Commonly associated shrubs include *Vaccinium ovatum*, *Arctostaphylos crustacea*, and *Arctostaphylos sensitiva*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	19.3	5 – 50	15.8	10 – 20
Hardwood	27.3	8 – 65	10.8	5 – 15
Regenerating or Shrubby Tree	4.7	0 – 16	2.2	1 – 5
Shrub	14.0	5 – 29	2.4	0 – 5
Herb	0.6	0 – 1	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 463 m, Range 319 – 636 m

Aspect: SE (2), NW (2)

Slope: Mean 18 degrees, Range 15 – 23 degrees

Macro Topography: Upper 1/3 of slope (2), Middle 1/3 of slope (1), Not recorded (1)

Large Rock: 0.0%

Small Rock: Mean 9.4%, Range 0.0 – 28.0%

Fines Cover: Mean 9.3%, Range 0.0 – 30.0%

Litter Cover: Mean 56.8%, Range 0.0 – 95%

Soil Texture (field assessed): Medium silt (1), Moderately fine silty clay loam (1),
Medium sand (1), Not recorded (1)

Geology (field or map data): Sandstone (2), Sandstone and other sedimentary (1),
Shale (1)

San Mateo County Watersheds: Pescadero Creek (2), Palo Alto (1), San Gregorio
Creek (1)

Site Impacts

This association has very low non-native plant cover (average 0.0%) relative to native cover. No non-natives were recorded by the surveyors.

Classification Comments

This association was formerly placed in the *Pseudotsuga menziesii* Alliance.

References: Evens and Kentner 2006, Jimerson et al. 1996

Global Rarity Rank: G3

State Rarity Rank: S3

State Rare: Y

Surveys Used for Description

Total: N=4; San Mateo County (n=4): SMAT0050, SMAT0288, SMAT0683, SMATR0656

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft	
Tree	<i>Chrysolepis chrysophylla</i> var. <i>chrysophylla</i>	100.0	52.0	25.8	8	60		Y		Y	
	<i>Pseudotsuga menziesii</i>	100.0	40.4	18.8	5	50			Y	Y	
	<i>Arbutus menziesii</i>	75.0	2.5	1.9	0.2	7				Y	
	<i>Notholithocarpus densiflorus</i>	50.0	2.4	1.8	0.2	7				Y	
	<i>Pinus attenuata</i>	50.0	2.2	0.6	0.2	2				Y	
	<i>Quercus chrysolepis</i>	50.0	0.4	0.1	0.2	0.2				Y	
	<i>Quercus parvula</i> var. <i>shrevei</i>	25.0	0.2	0.1	0.2	0.2					
	Regenerating or Shrubby Trees	<i>Notholithocarpus densiflorus</i>	75.0	45.9	2.1	0.2	7.2			Y	Y
		<i>Pseudotsuga menziesii</i>	50.0	24.0	2.3	1.2	8				Y
<i>Chrysolepis chrysophylla</i> var. <i>chrysophylla</i>		25.0	1.9	0.1	0.2	0.2					
<i>Quercus parvula</i> var. <i>shrevei</i>		25.0	1.9	0.1	0.2	0.2					
<i>Chrysolepis chrysophylla</i> var. <i>minor</i>		25.0	0.6	0.1	0.4	0.4					
<i>Arbutus menziesii</i>		25.0	0.6	0.1	0.4	0.4					
Shrub											

	<i>Vaccinium ovatum</i>	100.0	33.0	5.9	0.2	15	Y	Y
	<i>Arctostaphylos crustacea</i>	75.0	33.4	3.8	3	9	Y	Y
	<i>Arctostaphylos sensitiva</i>	50.0	15.4	4.0	1	15		Y
	<i>Rubus ursinus</i>	25.0	14.5	1.3	5	5		
	<i>Rhododendron macrophyllum</i>	25.0	2.6	0.8	3	3		
	<i>Rosa gymnocarpa</i>	25.0	0.6	0.1	0.2	0.2		
	<i>Lonicera hispidula</i>	25.0	0.6	0.1	0.2	0.2		
Herb								
	<i>Lotus junceus</i>	50.0	50.0	0.3	0.2	1		Y
	<i>Pteridium aquilinum</i>	25.0	25.0	0.1	0.2	0.2		
Non-Vascular								
	Moss	50.0	37.5	2.6	0.2	10		Y
	Lichen	25.0	12.5	0.1	0.2	0.2		

***Pseudotsuga menziesii* – *Notholithocarpus densiflorus* / *Vaccinium ovatum*
Association**

Common Name: Douglas-fir – Tanoak / Black Huckleberry (Moist Shrub) Woodland

Alliance: *Pseudotsuga menziesii* – (*Notholithocarpus densiflorus* – *Arbutus menziesii*)
Forest & Woodland Alliance

Local Vegetation Description

The Douglas-fir – Tanoak / Black Huckleberry (Moist Shrub) Association forms an intermittent to continuous tree canopy with an open shrub understory. The dominant tree is *Pseudotsuga menziesii*, and *Notholithocarpus densiflorus* is co-dominant. Regenerating or shrubby trees that are often present include *Notholithocarpus densiflorus* and *Pseudotsuga menziesii*. Commonly associated shrubs include *Rubus ursinus*, *Toxicodendron diversilobum*, *Lonicera hispidula*, and *Vaccinium ovatum*, and commonly associated herbs include *Polystichum munitum*, *Dryopteris arguta*, *Adenocaulon bicolor*, and *Galium aparine*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	40.0	25 – 55	37.5	20 – 50
Hardwood	31.6	18 – 40	15.8	10 – 20
Regenerating or Shrubby Tree	1.5	0 – 4.2	2.8	1 – 5
Shrub	12.0	2 – 27	0.8	0 – 2
Herb	9.8	2 – 20	0.4	0 – 1

Local Environmental Description

Elevation: Mean 529 m, Range 205 – 639 m

Aspect: NW (1), SE (1), Variable (1)

Slope: Mean 22 degrees, Range 16 – 30 degrees

Macro Topography: Middle to Upper 1/3 of slope (2), Upper 1/3 of slope (1)

Large Rock: Mean 0.9%, Range 0.0 – 1.4%

Small Rock: Mean 1.2%, Range 0.2 – 3.0%

Fines Cover: Mean 3.4%, Range 0.2 – 5.0%

Litter Cover: Mean 91.7%, Range 88.0 – 97%

Soil Texture (field assessed): Medium sand (1), Medium to very fine, sandy loam (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Sandstone (3), Shale and other sedimentary (2)

San Mateo County Watersheds: Pescadero Creek (2), Half Moon Bay (1), San Gregorio Creek (1), San Mateo Bayside (1)

Site Impacts

This association has very low non-native plant cover (average 0.3%) relative to native

cover. Non-native species that occur with highest frequency and abundance include *Ilex aquifolium*.

Classification Comments

This association was previously placed in the *Pseudotsuga menziesii* – *Notholithocarpus densiflorus* Alliance. *Gaultheria shallon* has been removed from the name of the association because of low constancy for this type in this county and elsewhere.

References: Simpson 1980, Thornburgh 1982

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=5; San Mateo County (n=5): PGA1045, PGA791, SMAT0237, SMAT0263, SMAT0293

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Pseudotsuga menziesii</i>	100.0	55.2	40.0	25	55		Y		Y
	<i>Notholithocarpus densiflorus</i>	100.0	43.4	31.4	15	40			Y	Y
	<i>Quercus agrifolia</i>	40.0	1.2	0.6	0.2	3				
	<i>Arbutus menziesii</i>	40.0	0.1	0.1	0.2	0.2				
Regenerating or Shrubby Trees	<i>Notholithocarpus densiflorus</i>	60.0	38.8	1.1	0.2	3.2				Y
	<i>Pseudotsuga menziesii</i>	60.0	10.1	0.2	0.2	0.4				Y
	<i>Umbellularia californica</i>	40.0	2.5	0.1	0.2	0.2				
Shrub	<i>Rubus ursinus</i>	100.0	35.2	5.8	0.2	15			Y	Y
	<i>Toxicodendron diversilobum</i>	80.0	6.2	0.7	0.2	3				Y
	<i>Vaccinium ovatum</i>	60.0	30.3	3.0	5	5				Y
	<i>Lonicera hispidula</i>	60.0	4.6	0.3	0.2	1				Y
	<i>Frangula californica</i>	40.0	0.6	0.1	0.2	0.2				
Herb										

	<i>Polystichum munitum</i>	100.0	33.6	5.1	0.2	10	Y	Y
	<i>Dryopteris arguta</i>	80.0	12.0	1.3	0.2	5		Y
	<i>Adenocaulon bicolor</i>	60.0	2.1	0.1	0.2	0.2		Y
	<i>Galium aparine</i>	60.0	0.9	0.1	0.2	0.2		Y
	<i>Iris spp.</i>	40.0	1.6	0.1	0.2	0.2		
Non-Vascular								
	Lichen	60.0	30.0	0.1	0.2	0.2		Y
	Moss	60.0	30.0	0.1	0.2	0.2		Y

***Pseudotsuga menziesii* – *Quercus agrifolia* Association**

Common Name: Douglas-fir / Coast Live Oak Woodland

Alliance: *Pseudotsuga menziesii* – (*Notholithocarpus densiflorus* – *Arbutus menziesii*)
Forest & Woodland Alliance

Local Vegetation Description

The Douglas-fir / Coast Live Oak Association forms an open to continuous tree canopy with an open to continuous shrub understory. The dominant tree is *Pseudotsuga menziesii*, and *Quercus agrifolia* and *Arbutus menziesii* are characteristic or often present. Commonly associated shrubs include *Rubus ursinus*, *Toxicodendron diversilobum*, *Frangula californica*, and *Lonicera hispidula*, and commonly associated herbs include *Dryopteris arguta* and *Polystichum munitum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	23.8	5 – 50	32.5	10 – 50
Hardwood	30.8	2 – 65	12.5	5 – 20
Regenerating or Shrubby Tree	3.5	0 – 24.0	2.5	1 – 5
Shrub	42.1	2.0 – 85.0	2.8	0 – 5
Herb	23.5	2 – 55	0.3	0 – 1

Local Environmental Description

Elevation: Mean 288 m, Range 92 – 637 m

Aspect: SW (3), NE (1)

Slope: Mean 16 degrees, Range 7 – 25 degrees

Macro Topography: Middle to Upper 1/3 of slope (1), Ridge top (1), Upper 1/3 of slope (1), Middle 1/3 of slope (1)

Large Rock: Mean 0.0%, Range 0.0 – 0.2%

Small Rock: Mean 0.2%, Range 0.0 – 1.0%

Fines Cover: Mean 20.1%, Range 0.1 – 60.5%

Litter Cover: Mean 61.4%, Range 1.0 – 93%

Soil Texture (field assessed): Coarse, loamy sand (2), Moderately fine clay loam (1), Not recorded (1)

Geology (field or map data): Sandstone and other sedimentary (4), Franciscan melange (4), Granitic (2), Sandstone (2), Volcanic and metavolcanic rocks (1), Sandstone, shale, and conglomerate (1), Metamorphic (type unknown) (1), Shale and other sedimentary (1)

San Mateo County Watersheds: Half Moon Bay (6), San Mateo Bayside (6), Pescadero Creek (2), Palo Alto (1), San Gregorio Creek (1)

Site Impacts

Pseudotsuga menziesii – *Quercus agrifolia* Association

Pseudotsuga menziesii – (*Notholithocarpus densiflorus* – *Arbutus menziesii*) Forest & Woodland Alliance

This association has low non-native plant cover (average 3.6%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Galium aparine*.

Classification Comments

This association was formerly placed in the *Pseudotsuga menziesii*

Alliance. **References:** Evens and Kentner 2006, Keeler-Wolf et al.

2003a, Klein et al. 2015

Global Rarity Rank: G3

State Rarity Rank: S3

State Rare: Y

Surveys Used for Description

Total: N=16; San Mateo County (n=16): GGNRA335, GGNRA378, PGA1001, PGA1005, PGA11475, PGA11944, PGA11991, PGA12295, PGA750, PGA763, PGA805, PGA987, PWDFR03A, SMAT0052, SMAT0280, TOKA064A

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Pseudotsuga menziesii</i>	100.0	52.0	27.1	8	60		Y		Y
	<i>Quercus agrifolia</i>	93.8	28.7	16.6	1	58				Y
	<i>Arbutus menziesii</i>	56.3	6.5	3.4	0.2	20				Y
	<i>Umbellularia californica</i>	31.3	2.5	1.6	0.2	20				
Shrub	<i>Toxicodendron diversilobum</i>	93.8	22.2	11.6	0.2	60				Y
	<i>Rubus ursinus</i>	81.3	22.3	10.4	0.2	36				Y
	<i>Frangula californica</i>	68.8	17.6	7.3	0.2	50				Y
	<i>Lonicera hispidula</i>	62.5	2.0	0.5	0.2	3				Y
	<i>Heteromeles arbutifolia</i>	43.8	7.4	3.5	0.2	25				
	<i>Sambucus racemosa</i>	31.3	5.1	2.4	0.2	30				
	<i>Baccharis pilularis</i>	31.3	4.5	3.0	0.2	32				
	<i>Ceanothus thyrsiflorus</i>	25.0	3.1	2.2	0.2	20				
	<i>Diplacus aurantiacus</i>	25.0	1.8	0.8	0.2	10				
Herb	<i>Dryopteris arguta</i>	68.8	17.8	4.2	0.2	15				Y
	<i>Polystichum munitum</i>	56.3	12.5	4.5	0.2	25				Y
	<i>Stachys ajugoides</i>	37.5	3.9	2.5	0.2	30				
	<i>Marah fabaceus</i>	37.5	2.2	1.7	0.2	18.2				

Pseudotsuga menziesii – *Quercus agrifolia* Association

Pseudotsuga menziesii – (*Notholithocarpus densiflorus* – *Arbutus menziesii*) Forest & Woodland Alliance

<i>Urtica dioica</i>	31.3	6.8	2.7	0.2	30
<i>Clinopodium douglasii</i>	31.3	6.1	0.2	0.2	2
<i>Galium aparine</i>	31.3	1.8	1.7	0.2	25
<i>Cynoglossum grande</i>	31.3	1.8	0.4	0.2	5
<i>Elymus californicus</i>	25.0	3.3	1.2	0.2	10
<i>unknown Poaceae</i>	25.0	2.8	1.2	2	10.17
					7
<i>Galium californicum</i>	25.0	2.0	0.2	0.2	3

Pseudotsuga menziesii – Quercus chrysolepis Association

Common Name: Douglas-fir – Canyon Live Oak Woodland

Alliance: *Pseudotsuga menziesii* – (*Notholithocarpus densiflorus* – *Arbutus menziesii*)
Forest & Woodland Alliance

Local Vegetation Description

The Douglas-fir – Canyon Live Oak Association forms a continuous tree canopy with an open shrub understory in the single survey available. The dominant tree is *Pseudotsuga menziesii*, and *Quercus chrysolepis*, *Umbellularia californica*, and *Notholithocarpus densiflorus* are characteristic or often present. Regenerating or shrubby trees that are often present include *Notholithocarpus densiflorus*. Commonly associated shrubs include *Lonicera hispidula*, *Toxicodendron diversilobum*, and commonly associated herbs include *Polystichum munitum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	40.0	NA	42.5	35 – 50
Hardwood	25.0	NA	17.5	15 – 20
Regenerating or Shrubby Tree	1.4	NA	1.5	1 – 2
Shrub	8.0	NA	1.5	1 – 2
Herb	3.0	NA	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 669 m, Range 669 – 669 m

Aspect: SE (1)

Slope: Mean 8 degrees, Range 8 – 8 degrees

Macro Topography: Upper 1/3 of slope (1)

Large Rock: 0.2%

Small Rock: 0.2%

Fines Cover: 10.0%

Litter Cover: 87%

Soil Texture (field assessed): Medium to very fine, sandy loam (1)

Geology (field or map data): Sandstone (1)

San Mateo County Watersheds: San Gregorio Creek (1)

Site Impacts

This association has very low non-native plant cover (average 0.2%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Carduus pycnocephalus* and *Cynosurus echinatus*.

Classification Comments

Pseudotsuga menziesii – *Quercus chrysolepis* Association
Pseudotsuga menziesii – (*Notholithocarpus densiflorus* – *Arbutus menziesii*) Forest & Woodland Alliance

This association was formerly placed in the *Pseudotsuga menziesii* Alliance.

References: Evens and Kentner 2006, Jimerson et al. 1996, Keeler-Wolf et al. 2003b, Klein et al. 2007, Klein et al. 2015, Taylor and Teare 1979b

Global Rarity Rank: G3? **State Rarity Rank:** S3? **State Rare:** Y

Surveys Used for Description

Total: N=1; San Mateo County (n=1): SMAT0291

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Pseudotsuga menziesii</i>	100.0	46.7	35.0	35	35			Y	Y
	<i>Quercus chrysolepis</i>	100.0	20.0	15.0	15	15				Y
	<i>Arbutus menziesii</i>	100.0	13.3	10.0	10	10				Y
	<i>Notholithocarpus densiflorus</i>	100.0	13.3	10.0	10	10				Y
	<i>Sequoia sempervirens</i>	100.0	6.7	5.0	5	5				Y
	Regenerating or Shrubby Trees	<i>Quercus chrysolepis</i>	100.0	28.6	0.4	0.4	0.4			
<i>Notholithocarpus densiflorus</i>		100.0	28.6	0.4	0.4	0.4				Y
<i>Sequoia sempervirens</i>		100.0	14.3	0.2	0.2	0.2				Y
<i>Pseudotsuga menziesii</i>		100.0	14.3	0.2	0.2	0.2				Y
<i>Arbutus menziesii</i>		100.0	14.3	0.2	0.2	0.2				Y
Shrub		<i>Vaccinium ovatum</i>	100.0	81.6	8.0	8	8		Y	
	<i>Symphoricarpos albus</i>	100.0	10.2	1.0	1	1				Y
	<i>Lonicera hispidula</i>	100.0	2.0	0.2	0.2	0.2				Y
	<i>Frangula californica</i>	100.0	2.0	0.2	0.2	0.2				Y
	<i>Toxicodendron diversilobum</i>	100.0	2.0	0.2	0.2	0.2				Y
	<i>Rubus ursinus</i>	100.0	2.0	0.2	0.2	0.2				Y
	Herb									

Pseudotsuga menziesii – *Quercus chrysolepis* Association

Pseudotsuga menziesii – (*Notholithocarpus densiflorus* – *Arbutus menziesii*) Forest & Woodland Alliance

	<i>Juncus patens</i>	100.0	16.7	0.2	0.2	0.2		Y
	<i>Carex spp.</i>	100.0	16.7	0.2	0.2	0.2		Y
	<i>Iris spp.</i>	100.0	16.7	0.2	0.2	0.2		Y
	<i>Clinopodium douglasii</i>	100.0	16.7	0.2	0.2	0.2		Y
	<i>Fragaria vesca</i>	100.0	16.7	0.2	0.2	0.2		Y
	<i>Epipactis helleborine</i>	100.0	16.7	0.2	0.2	0.2		Y
Non-Vascular								
	Moss	100.0	50.0	0.2	0.2	0.2	Y	Y
	Lichen	100.0	50.0	0.2	0.2	0.2	Y	Y

***Pseudotsuga menziesii* – *Umbellularia californica* / (*Toxicodendron diversilobum*) Association**

Common Name: Douglas-fir – California Bay Woodland

Alliance: *Pseudotsuga menziesii* – (*Notholithocarpus densiflorus* – *Arbutus menziesii*)
Forest & Woodland Alliance

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	45.0	45 – 45	42.5	35 – 50
Hardwood	20.0	15 – 25	17.5	15 – 20
Regenerating or Shrubby Tree	1.2	0 – 2.2	3.5	2 – 5
Shrub	24.5	4.0 – 45.0	2.5	1 – 5
Herb	48.0	4 – 92	0.3	0 – 0.5

Local Vegetation Description

The Douglas-fir – California Bay Association forms an intermittent to continuous tree canopy with an open to intermittent shrub understory. The dominant tree is *Pseudotsuga menziesii* and *Umbellularia californica*. Commonly associated shrubs include *Lonicera hispidula* and *Toxicodendron diversilobum*, and commonly associated herbs include *Polystichum munitum*.

Local Environmental Description

Elevation: Mean 300 m, Range 192 – 420 m

Aspect: SE (1), SW (1)

Slope: Mean 23 degrees, Range 20 – 25 degrees

Macro Topography: Lower 1/3 of slope (1), Upper 1/3 of slope (1)

Large Rock: Mean 1.5%, Range 0.0 – 3.0%

Small Rock: Mean 3.0%, Range 0.0 – 6.0%

Fines Cover: Mean 5.0%, Range 5.0 – 5.0%

Litter Cover: Mean 51.0%, Range 10.0 – 92%

Soil Texture (field assessed): Medium to very fine, sandy loam (1), Moderately fine silty clay loam (1)

Geology (field or map data): Granitic (1), Sandstone and other sedimentary (1), Shale and other sedimentary (1)

San Mateo County Watersheds: Half Moon Bay (2), Palo Alto (1)

Site Impacts

This association has low non-native plant cover (average 16.3%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Delairea odorata* and *Erechtites minimus*.

Classification Comments

The name of this association has been updated to reflect the combination of two previously used names, *Pseudotsuga menziesii* – *Umbellularia californica* and *Pseudotsuga menziesii* – *Umbellularia californica* / *Toxicodendron diversilobum* Associations, formerly in the *Pseudotsuga menziesii* Alliance, into a single type.

References: Evens and Kentner 2006, Jimerson et al. 1995, Jimerson et al. 1996, Klein et al. 2015, Wainwright and Barbour 1984

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=3; San Mateo County (n=3): GGNRA318, PGA12176, SMAT0214

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Pseudotsuga menziesii</i>	100.0	60.0	36.3	20	50		Y		Y
	<i>Umbellularia californica</i>	100.0	24.4	14.8	9	20				Y
	<i>Quercus agrifolia</i>	50.0	2.5	1.8	2	5				Y
	<i>Notholithocarpus densiflorus</i>	50.0	0.9	0.5	1	1				Y
	<i>Quercus spp.</i>	25.0	8.3	3.8	15	15				
	<i>Sequoia sempervirens</i>	25.0	3.5	2.5	10	10				
	<i>Arbutus menziesii</i>	25.0	0.4	0.3	1	1				
	Regenerating or Shrubby Trees	<i>Umbellularia californica</i>	50.0	22.4	0.4	0.4	1			
<i>Pseudotsuga menziesii</i>		50.0	17.2	0.4	0.2	1.2				Y
<i>Aesculus californica</i>		25.0	25.0	0.1	0.2	0.2				
<i>Sequoia sempervirens</i>		25.0	4.5	0.1	0.4	0.4				
<i>Acer macrophyllum</i>		25.0	3.6	0.1	0.2	0.2				
<i>Notholithocarpus densiflorus</i>		25.0	2.3	0.1	0.2	0.2				
Shrub	<i>Rubus ursinus</i>	75.0	24.9	5.5	1	15				Y

Pseudotsuga menziesii – *Umbellularia californica* / (*Toxicodendron diversilobum*) Association
Pseudotsuga menziesii – (*Notholithocarpus densiflorus* – *Arbutus menziesii*) Forest & Woodland Alliance

	<i>Toxicodendron diversilobum</i>	75.0	12.7	2.3	0.2	8	Y
	<i>Lonicera hispidula</i>	75.0	4.4	1.3	0.2	4	Y
	<i>Holodiscus discolor</i>	75.0	2.1	0.8	0.2	2	Y
	<i>Sambucus racemosa</i>	50.0	19.6	8.3	3.2	30	Y
	<i>Symphoricarpos mollis</i>	50.0	6.4	0.3	0.2	1	Y
	<i>Corylus cornuta</i>	50.0	6.1	2.8	1	10	Y
	<i>Rubus parviflorus</i>	25.0	11.7	2.5	10	10	
	<i>Frangula californica</i>	25.0	6.3	0.3	1	1	
	<i>Vaccinium ovatum</i>	25.0	2.6	1.3	5	5	
	<i>Rosa gymnocarpa</i>	25.0	1.6	0.5	2	2	
	<i>Heteromeles arbutifolia</i>	25.0	0.8	0.3	1	1	
	<i>Ribes californicum</i>	25.0	0.2	0.1	0.2	0.2	
	<i>Baccharis pilularis</i>	25.0	0.2	0.1	0.2	0.2	
	<i>Eriodictyon californicum</i>	25.0	0.2	0.1	0.2	0.2	
	<i>Ribes sanguineum</i>	25.0	0.2	0.1	0.2	0.2	
	<i>Hedera helix</i>	25.0	0.1	0.1	0.2	0.2	
Herb							
	<i>Dryopteris arguta</i>	75.0	16.1	2.3	0.2	8	Y
	<i>Polystichum munitum</i>	75.0	8.5	1.6	0.2	6	Y
	<i>Clinopodium douglasii</i>	75.0	3.8	0.6	0.2	2	Y
	<i>Myosotis latifolia</i>	75.0	1.5	0.6	0.2	2	Y
	<i>Cynoglossum grande</i>	50.0	6.8	0.3	0.2	1	Y
	<i>Stachys ajugoides</i>	50.0	6.6	3.0	2	10	Y
	<i>Pteridium aquilinum</i>	50.0	5.8	5.1	0.2	20	Y
	<i>Iris douglasiana</i>	50.0	2.5	0.3	0.2	1	Y
	<i>Stachys bullata</i>	50.0	1.6	0.1	0.2	0.2	Y
	<i>Madia madioides</i>	50.0	1.6	0.1	0.2	0.2	Y
	<i>Torilis arvensis</i>	50.0	1.4	0.1	0.2	0.2	Y
	<i>Fragaria vesca</i>	50.0	0.4	0.1	0.2	0.2	Y
	<i>Sanicula crassicaulis</i>	50.0	0.4	0.1	0.2	0.2	Y
	<i>Marah fabaceus</i>	50.0	0.2	0.1	0.2	0.2	Y
	<i>Delairea odorata</i>	25.0	12.8	11.3	45	45	
	<i>Erechtites minimus</i>	25.0	9.2	3.8	15.2	15.2	
	<i>Phalaris aquatica</i>	25.0	3.6	1.5	6	6	
	<i>Urtica dioica</i>	25.0	2.9	2.5	10	10	
	<i>Vinca major</i>	25.0	2.9	2.5	10	10	
	<i>Maianthemum stellatum</i>	25.0	1.3	0.1	0.2	0.2	
	<i>Trientalis borealis ssp. latifolia</i>	25.0	1.3	0.1	0.2	0.2	
	<i>Pentagramma triangularis</i>	25.0	1.3	0.1	0.2	0.2	
	<i>Aquilegia formosa</i>	25.0	1.2	0.5	2	2	
	<i>Poa secunda</i>	25.0	0.6	0.3	1	1	
	<i>Solanum physalifolium</i>	25.0	0.6	0.3	1	1	
	<i>Bromus vulgaris</i>	25.0	0.5	0.1	0.4	0.4	

<i>Pholistoma membranaceum</i>	25.0	0.2	0.1	0.2	0.2	
<i>Plantago lanceolata</i>	25.0	0.2	0.1	0.2	0.2	
<i>Cardamine californica</i>	25.0	0.2	0.1	0.2	0.2	
<i>Chlorogalum pomeridianum</i>	25.0	0.2	0.1	0.2	0.2	
<i>Claytonia perfoliata</i>	25.0	0.2	0.1	0.2	0.2	
<i>Polygala californica</i>	25.0	0.2	0.1	0.2	0.2	
<i>Bromus spp.</i>	25.0	0.2	0.1	0.2	0.2	
unknown Apiaceae	25.0	0.2	0.1	0.2	0.2	
<i>Galium californicum</i>	25.0	0.2	0.1	0.2	0.2	
<i>Osmorhiza berteroi</i>	25.0	0.2	0.1	0.2	0.2	
<i>Juncus spp.</i>	25.0	0.2	0.1	0.2	0.2	
<i>Epipactis helleborine</i>	25.0	0.2	0.1	0.2	0.2	
<i>Melica subulata</i>	25.0	0.2	0.1	0.2	0.2	
<i>Juncus patens</i>	25.0	0.1	0.1	0.2	0.2	
unknown	25.0	0.1	0.1	0.2	0.2	
Convolvulaceae	25.0	0.1	0.1	0.2	0.2	
<i>Scrophularia californica</i>	25.0	0.1	0.1	0.2	0.2	
<i>Sonchus asper</i>	25.0	0.1	0.1	0.2	0.2	
<i>Lolium perenne</i>	25.0	0.1	0.1	0.2	0.2	
<i>Eschscholzia californica</i>	25.0	0.1	0.1	0.2	0.2	
<i>Galium aparine</i>	25.0	0.1	0.1	0.2	0.2	
unknown Lamiaceae	25.0	0.1	0.1	0.2	0.2	
<i>Cardamine oligosperma</i>	25.0	0.1	0.1	0.2	0.2	
<i>Carduus pycnocephalus</i>	25.0	0.1	0.1	0.2	0.2	
<i>Geranium dissectum</i>	25.0	0.1	0.1	0.2	0.2	
<i>Conium maculatum</i>	25.0	0.1	0.1	0.2	0.2	
<i>Brassica nigra</i>	25.0	0.1	0.1	0.2	0.2	
Forb (herbaceous, not grass nor grasslike)	25.0	0.1	0.1	0.2	0.2	
Non-Vascular						
Moss	50.0	50.0	1.1	0.2	4	Y

***Pseudotsuga menziesii* – *Umbellularia californica* / *Polystichum munitum* Association**

Common Name: Douglas-fir – California Bay / Sword Fern Woodland

Alliance: *Pseudotsuga menziesii* – (*Notholithocarpus densiflorus* – *Arbutus menziesii*) Forest & Woodland Alliance

Local Vegetation Description

The Douglas-fir – California Bay / Sword Fern Association forms an intermittent to continuous tree canopy with an open to continuous shrub understory. The dominant tree is *Pseudotsuga menziesii*, and *Umbellularia californica* is characteristically present. Commonly associated shrubs include *Rubus ursinus*, *Vaccinium ovatum*, *Sambucus racemosa*, *Corylus cornuta*, and *Toxicodendron diversilobum*. The dominant herb is *Polystichum munitum*.

Lifeform	Cover (%)		Height (m)	
	Mean	Range	Mean	Range
Conifer	58.3	40 – 85	42.5	35 – 50
Hardwood	16.0	3 – 30	10.5	2 – 20
Regenerating or Shrubby Tree	3.0	0 – 10.0	1.5	1 – 2
Shrub	50.0	26 – 80	2.1	0.5 – 5
Herb	49.7	30 – 75	1.0	0.5 – 2

Local Environmental Description

Elevation: Mean 388 m, Range 277 – 462 m

Aspect: NE (1), NW (1)

Slope: Mean 28 degrees, Range 27 – 29 degrees

Macro Topography: Middle 1/3 of slope (1), Upper 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: Mean 3.0%, Range 1.0 – 5.0%

Fines Cover: 5.0%

Litter Cover: Mean 87.0%, Range 84.0 – 90%

Soil Texture (field assessed): Coarse, loamy sand (1), Moderately fine clay loam (1)

Geology (field or map data): Franciscan melange (1), Volcanic flow rocks (1), Granitic (1)

San Mateo County Watersheds: Half Moon Bay (1), Palo Alto (1), San Mateo Bayside (1)

Site Impacts

This association has low non-native plant cover (average 9.7%) relative to native

Pseudotsuga menziesii – *Umbellularia californica* / *Polystichum munitum* Association
Pseudotsuga menziesii – (*Notholithocarpus densiflorus* – *Arbutus menziesii*) Forest & Woodland Alliance

cover. Non-native species that occur with highest frequency and abundance include *Erechtites minimus* and *Myosotis latifolia*.

Classification Comments

This association was formerly placed in the *Pseudotsuga menziesii* Alliance.

References: Evens and Kentner 2006, Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: G4 **State Rarity Rank:** S4? **State Rare:** N

Surveys Used for Description

Total: N=4; San Mateo County (n=4): GGNRA338, PGA12312, PGA1873, SMAT0027

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Pseudotsuga menziesii</i>	100.0	80.3	52.5	35	85		Y		Y
	<i>Umbellularia californica</i>	100.0	9.1	6.8	0.2	20				Y
	<i>Notholithocarpus densiflorus</i>	50.0	9.7	6.3	10	15				Y
	<i>Acer macrophyllum</i>	25.0	0.9	0.5	2	2				
	<i>Aesculus californica</i>	25.0	0.1	0.1	0.2	0.2				
	Regenerating or Shrubby Trees	<i>Quercus agrifolia</i>	25.0	25.0	0.5	2	2			
<i>Notholithocarpus densiflorus</i>		25.0	12.5	1.3	5	5				
<i>Umbellularia californica</i>		25.0	12.5	1.3	5	5				
Shrub	<i>Rubus ursinus</i>	75.0	49.8	20.0	20	40			Y	Y
	<i>Toxicodendron diversilobum</i>	75.0	1.8	1.4	0.2	5				Y
	<i>Vaccinium ovatum</i>	50.0	22.3	18.0	2	70				Y
	<i>Sambucus racemosa</i>	50.0	0.7	0.6	0.2	2				Y
	<i>Corylus cornuta</i>	50.0	0.3	0.1	0.2	0.2				Y
	<i>Genista monspessulana</i>	25.0	13.0	6.3	25	25				
	<i>Cornus sericea</i>	25.0	4.7	1.3	5	5				
<i>Rubus parviflorus</i>	25.0	3.6	1.8	7	7					

	<i>Hedera helix</i>	25.0	1.5	1.3	5	5		
	<i>Symphoricarpos albus</i>	25.0	0.9	0.3	1	1		
	<i>Sambucus nigra</i>	25.0	0.5	0.3	1	1		
	<i>Ribes malvaceum</i>	25.0	0.2	0.1	0.2	0.2		
	<i>Lonicera hispidula</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Symphoricarpos spp.</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Ribes sanguineum</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Heteromeles arbutifolia</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Frangula purshiana</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Frangula californica</i>	25.0	0.1	0.1	0.2	0.2		
Herb								
	<i>Polystichum munitum</i>	100.0	54.3	23.8	7	50	Y	Y
	<i>Marah fabaceus</i>	75.0	0.4	0.2	0.2	0.2		Y
	<i>Galium aparine</i>	75.0	0.3	0.2	0.2	0.2		Y
	<i>Urtica dioica</i>	50.0	20.9	13.0	17	35		Y
	<i>Myosotis latifolia</i>	50.0	12.9	11.3	0.2	45		Y
	<i>Dryopteris arguta</i>	50.0	1.5	0.8	0.2	3		Y
	<i>Pteridium aquilinum</i>	50.0	0.3	0.1	0.2	0.2		Y
	<i>Stachys bullata</i>	50.0	0.2	0.1	0.2	0.2		Y
	<i>Vicia gigantea</i>	25.0	6.4	2.5	10	10		
	Forb (herbaceous, not grass nor grasslike)	25.0	1.6	0.5	2	2		
	<i>Clinopodium douglasii</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Aquilegia formosa</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Trillium spp.</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Scrophularia californica</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Sanicula crassicaulis</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Cardamine californica</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Heuchera micrantha</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Claytonia perfoliata</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Cynoglossum grande</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Epipactis helleborine</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Solanum spp.</i>	25.0	0.1	0.1	0.2	0.2		
Non-Vascular								
	Lichen	25.0	25.0	12.5	50	50		

***Pseudotsuga menziesii* / (*Toxicodendron diversilobum*) Association**

Common Name: Douglas-fir Woodland

Alliance: *Pseudotsuga menziesii* – (*Notholithocarpus densiflorus* – *Arbutus menziesii*)
Forest & Woodland Alliance

Local Vegetation Description

The Douglas-fir Association forms an intermittent to continuous tree canopy with a sparse to intermittent shrub understory. The dominant tree is *Pseudotsuga menziesii*. Commonly associated shrubs include *Rubus ursinus* and *Toxicodendron diversilobum*, and commonly associated herbs include *Clinopodium douglasii*, *Polystichum munitum*, and *Stachys ajugoides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	66.5	35 – 98	no data	no data
Hardwood	0.1	0 – 0.2	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	31.8	1.0 – 62.5	no data	no data
Herb	4.0	1 – 7	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 365 m, Range 320 – 409 m

Aspect: no data

Slope: no data

Macro Topography: no data

Large Rock: no data

Small Rock: no data

Fines Cover: no data

Litter Cover: no data

Soil Texture (field assessed): no data

Geology (field or map data): Franciscan melange (1), Volcanic and metavolcanic rocks (1)

San Mateo County Watersheds: San Mateo Bayside (2)

Site Impacts

This association has low non-native plant cover (average 1.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Carduus pycnocephalus*, *Cirsium vulgare*, *Cynosurus echinatus*, *Festuca arundinacea*, *Holcus lanatus*, and *Myosotis latifolia*.

Classification Comments

This association has been renamed from *Pseudotsuga menziesii* Association to conform to the NVC. It was formerly placed in the *Pseudotsuga menziesii* Alliance.

References: Evens and Kentner 2006, Klein et al. 2007, Stuart et al. 1992, Stuart et al. 1996

Global Rarity Rank: G4 **State Rarity Rank:** S4 **State Rare:** N

Surveys Used for Description

Total: N=2; San Mateo County (n=2): PGA725, PWDFR01A

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Pseudotsuga menziesii</i>	100.0	99.7	67.8	37.5	98		Y		Y
	<i>Quercus agrifolia</i>	50.0	0.3	0.1	0.2	0.2				Y
Shrub	<i>Rubus ursinus</i>	100.0	69.5	18.9	0.2	37.5			Y	Y
	<i>Lonicera hispidula</i>	50.0	25.0	0.1	0.2	0.2				Y
	<i>Frangula californica</i>	50.0	3.6	1.5	3	3				Y
	<i>Acacia spp.</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Hedera helix</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Toxicodendron diversilobum</i>	50.0	0.2	0.1	0.2	0.2				
	<i>Cotoneaster pannosus</i>	50.0	0.2	0.1	0.2	0.2				
	<i>Sambucus racemosa</i>	50.0	0.2	0.1	0.2	0.2				
	<i>Berberis spp.</i>	50.0	0.2	0.1	0.2	0.2				
	<i>Ribes spp.</i>	50.0	0.2	0.1	0.2	0.2				
	<i>Ilex aquifolium</i>	50.0	0.2	0.1	0.2	0.2				
Herb	<i>Sanicula crassicaulis</i>	50.0	25.0	0.1	0.2	0.2				Y
	<i>Galium spp.</i>	50.0	25.0	0.1	0.2	0.2				Y
	<i>Urtica dioica</i>	50.0	19.7	1.5	3	3				Y
	<i>Vicia spp.</i>	50.0	1.3	0.1	0.2	0.2				Y
	<i>Epipactis helleborine</i>	50.0	1.3	0.1	0.2	0.2				Y
	<i>Clinopodium douglasii</i>	50.0	1.3	0.1	0.2	0.2				Y
	<i>Hypochaeris radicata</i>	50.0	1.3	0.1	0.2	0.2				Y
	<i>Holcus lanatus</i>	50.0	1.3	0.1	0.2	0.2				Y
	<i>Galium aparine</i>	50.0	1.3	0.1	0.2	0.2				Y
	<i>Galium triflorum</i>	50.0	1.3	0.1	0.2	0.2				Y

<i>Heracleum maximum</i>	50.0	1.3	0.1	0.2	0.2	Y
<i>Polystichum munitum</i>	50.0	1.3	0.1	0.2	0.2	Y
<i>Oxalis corniculata</i>	50.0	1.3	0.1	0.2	0.2	Y
<i>Stachys ajugoides</i>	50.0	1.3	0.1	0.2	0.2	Y
<i>Bromus spp.</i>	50.0	1.3	0.1	0.2	0.2	Y
<i>Iris douglasiana</i>	50.0	1.3	0.1	0.2	0.2	Y
<i>Myosotis latifolia</i>	50.0	1.3	0.1	0.2	0.2	Y
<i>Claytonia perfoliata</i>	50.0	1.3	0.1	0.2	0.2	Y
<i>Elymus californicus</i>	50.0	1.3	0.1	0.2	0.2	Y
<i>Thalictrum fendleri</i>	50.0	1.3	0.1	0.2	0.2	Y
<i>Marah spp.</i>	50.0	1.3	0.1	0.2	0.2	Y
<i>Stellaria media</i>	50.0	1.3	0.1	0.2	0.2	Y
<i>Polypodium scolieri</i>	50.0	1.3	0.1	0.2	0.2	Y
<i>Elymus glaucus</i>	50.0	1.3	0.1	0.2	0.2	Y
<i>Dryopteris arguta</i>	50.0	1.3	0.1	0.2	0.2	Y
<i>Fragaria vesca</i>	50.0	1.3	0.1	0.2	0.2	Y

***Pseudotsuga menziesii* / *Baccharis pilularis* Association**

Common Name: Douglas-fir / Coyote Brush Woodland

Alliance: *Pseudotsuga menziesii* – (*Notholithocarpus densiflorus* – *Arbutus menziesii*)
Forest & Woodland Alliance

Local Vegetation Description

The Douglas-fir / Coyote Brush Association forms an open to continuous tree canopy with an intermittent to 70.0 shrub understory. The dominant tree is *Pseudotsuga menziesii*. Commonly associated shrubs include *Baccharis pilularis*, *Rubus ursinus*, *Toxicodendron diversilobum*, *Diplacus aurantiacus*, and *Frangula californica*, and commonly associated herbs include *Pteridium aquilinum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	54.4	35 – 75	no data	no data
Hardwood	5.0	0 – 15	no data	no data
Regenerating or Shrubby Tree	2.3	0 – 15.0	no data	no data
Shrub	48.3	35.0 – 70.0	3.5	2 – 5
Herb	15.3	3 – 49	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 351 m, Range 143 – 510 m

Aspect: NE (1), NW (1)

Slope: Mean 11 degrees, Range 8 – 14 degrees

Macro Topography: Upper 1/3 of slope (2)

Large Rock: 0.0%

Small Rock: Mean 0.2%, Range 0.0 – 1.0%

Fines Cover: Mean 58.7%, Range 51.9 – 70.0%

Litter Cover: Mean 37.2%, Range 2.0 – 60%

Soil Texture (field assessed): Moderately coarse, sandy loam (1), Medium to very fine, sandy loam (1)

Geology (field or map data): Granitic (4), Sandstone and other sedimentary (2), Sandstone, shale, and conglomerate (1), Shale and other sedimentary (1)

San Mateo County Watersheds: Pacifica (3), Ano Nuevo (2), Half Moon Bay (1), Pescadero Creek (1), San Mateo Bayside (1)

Site Impacts

This association has moderate non-native plant cover (average 20.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira caryophyllaea*, *Anagallis arvensis*, *Brachypodium distachyon*, *Briza minor*, *Bromus hordeaceus*, *Cirsium vulgare*, *Geranium dissectum*, *Holcus lanatus*, *Hypochaeris*

Pseudotsuga menziesii / *Baccharis pilularis* Association

Pseudotsuga menziesii – (*Notholithocarpus densiflorus* – *Arbutus menziesii*) Forest & Woodland Alliance

radicata, *Leucanthemum vulgare*, *Linum bienne*, *Lotus corniculatus*, *Phalaris aquatica*, *Plantago lanceolata*, *Rumex acetosella*, *Trifolium dubium*, and *Vulpia bromoides*.

Classification Comments

This association was formerly placed in the *Pseudotsuga menziesii* Alliance.

References: Keeler-Wolf et al. 2003a

Global Rarity Rank: G4 **State Rarity Rank:** S4? **State Rare:** N

Surveys Used for Description

Total: N=8; San Mateo County (n=8): BOPO317A, CLOV138, GGNRA356, GGNRA381, PGA1045A, PGA12173, PGA1827, TOKA137A

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree										
	<i>Pseudotsuga menziesii</i>	87.5	86.2	34.4	10	75			Y	Y
Regenerating or Shrubby Trees										
	<i>Pseudotsuga menziesii</i>	25.0	25.0	2.1	2	15				
Shrub										
	<i>Rubus ursinus</i>	100.0	10.7	4.0	1	10				Y
	<i>Baccharis pilularis</i>	87.5	50.4	19.8	6	40		Y		Y
	<i>Toxicodendron diversilobum</i>	75.0	24.2	14.8	0.2	55				Y
	<i>Frangula californica</i>	62.5	5.6	2.8	1	10				Y
	<i>Diplacus aurantiacus</i>	62.5	2.2	0.7	0.2	2				Y
	<i>Holodiscus discolor</i>	25.0	2.8	2.0	1	15				
Herb										
	<i>Pteridium aquilinum</i>	62.5	14.5	0.9	0.2	3		Y		Y
	<i>Marah fabaceus</i>	37.5	8.0	1.4	0.5435	9				Y
	<i>Scrophularia californica</i>	37.5	7.8	2.6	0.2	20				Y
	<i>Vulpia bromoides</i>	37.5	6.4	6.1	5.9783	26.415				Y
	<i>unknown Poaceae</i>	37.5	6.2	3.6	1	24.151				Y
	<i>Stachys ajugoides</i>	37.5	3.7	0.3	0.2	2				Y
	<i>Aira caryophyllea</i>	37.5	1.3	1.2	0.2	8.0645				Y
	<i>Artemisia douglasiana</i>	37.5	1.2	0.4	0.2	3				Y
	<i>Bromus hordeaceus</i>	37.5	0.5	0.5	0.5435	2.2642				

Pseudotsuga menziesii / *Baccharis pilularis* Association

Pseudotsuga menziesii – (*Notholithocarpus densiflorus* – *Arbutus menziesii*) Forest & Woodland Alliance

<i>Anagallis arvensis</i>	37.5	0.5	0.5	0.3774	2.1739
<i>Cirsium vulgare</i>	37.5	0.2	0.2	0.2	1.087
<i>Clinopodium douglasii</i>	25.0	6.0	0.3	1	1
<i>Plantago lanceolata</i>	25.0	3.9	3.5	5.914	22.283
<i>Polystichum munitum</i>	25.0	2.5	0.2	0.2	1
<i>Brachypodium distachyon</i>	25.0	1.4	1.3	4.3478	6.4516
<i>Rumex acetosella</i>	25.0	1.3	1.2	0.5376	9.434
<i>Geranium dissectum</i>	25.0	1.1	1.0	3.7736	4.3478
<i>Phalaris aquatica</i>	25.0	1.0	0.9	0.5435	6.9892
<i>Holcus lanatus</i>	25.0	0.8	0.7	1.1321	4.8387
<i>Linum bienne</i>	25.0	0.7	0.6	0.3774	4.3478
<i>Lotus corniculatus</i>	25.0	0.4	0.4	0.2	2.7174
<i>Danthonia californica</i>	25.0	0.4	0.4	0.7547	2.1739
<i>Hypochaeris radicata</i>	25.0	0.4	0.3	1.087	1.5094
<i>Urtica dioica</i>	25.0	0.2	0.1	0.2	0.2
<i>Sanicula crassicaulis</i>	25.0	0.2	0.1	0.2	0.5435
<i>Trifolium dubium</i>	25.0	0.2	0.2	0.2	1.087
<i>Rumex spp.</i>	25.0	0.1	0.1	0.2	0.5376
<i>Briza minor</i>	25.0	0.1	0.1	0.2	0.5376
<i>Achillea millefolium</i>	25.0	0.1	0.1	0.2	0.2
<i>Horkelia californica</i>	25.0	0.1	0.1	0.2	0.2
<i>Leucanthemum vulgare</i>	25.0	0.1	0.1	0.2	0.2
Non-Vascular					
Moss	37.5	37.5	0.3	0.5376	1

***Pseudotsuga menziesii* / *Corylus cornuta* / *Polystichum munitum* Association**

Common Name: Douglas-fir / Hazel / Sword Fern Woodland

Alliance: *Pseudotsuga menziesii* – (*Notholithocarpus densiflorus* – *Arbutus menziesii*)
Forest & Woodland Alliance

Local Vegetation Description

The Douglas-fir / Hazel / Sword Fern Association forms an open to continuous tree canopy with an intermittent to continuous shrub understory. The dominant tree is *Pseudotsuga menziesii*. Commonly associated shrubs include *Rubus ursinus*, *Toxicodendron diversilobum*, *Corylus cornuta*, *Frangula californica*, *Sambucus racemosa*, and *Vaccinium ovatum*, and commonly associated herbs include *Polystichum munitum* and *Urtica dioica*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	52.5	20 – 75	27.5	20 – 35
Hardwood	11.3	0 – 35	no data	no data
Regenerating or Shrubby Tree	0.2	0 – 0.6	no data	no data
Shrub	65.0	60.0 – 80.0	2.5	1 – 5
Herb	27.3	4 – 45	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 441 m, Range 254 – 537 m

Aspect: SW (1)

Slope: Mean 14 degrees, Range 14 – 14 degrees

Macro Topography: Ridge top (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: 0.0%

Litter Cover: 95%

Soil Texture (field assessed): Moderately coarse, sandy loam (1)

Geology (field or map data): Granitic (2), Sandstone, shale, and conglomerate (1)

San Mateo County Watersheds: Pacifica (2), Half Moon Bay (1)

Site Impacts

This association has low non-native plant cover (average 3.9%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Holcus lanatus* and *Myosotis latifolia*.

Classification Comments

Pseudotsuga menziesii / *Corylus cornuta* / *Polystichum munitum* Association
Pseudotsuga menziesii – (*Notholithocarpus densiflorus* – *Arbutus menziesii*) Forest & Woodland Alliance

The name of this association has been updated to include *Polystichum munitum*. It was formerly placed in the *Pseudotsuga menziesii* Alliance.

References: Jimerson et al. 1996, Simpson 1980

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=4; San Mateo County (n=4): PGA12003, PGA12292, PGA736, SMAT0152

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Pseudotsuga menziesii</i>	100.0	79.7	52.5	20	75		Y		Y
	<i>Umbellularia californica</i>	50.0	10.8	6.3	5	20				Y
	<i>Quercus agrifolia</i>	50.0	9.2	5.0	5	15				Y
	<i>Notholithocarpus densiflorus</i>	25.0	0.3	0.3	1	1				
Regenerating or Shrubby Trees	<i>Notholithocarpus densiflorus</i>	25.0	16.7	0.1	0.4	0.4				
	<i>Umbellularia californica</i>	25.0	8.3	0.1	0.2	0.2				
Shrub	<i>Rubus ursinus</i>	100.0	19.2	13.8	0.2	30				Y
	<i>Toxicodendron diversilobum</i>	100.0	16.1	10.1	0.2	15				Y
	<i>Frangula californica</i>	100.0	5.9	4.6	0.2	15				Y
	<i>Holodiscus discolor</i>	75.0	0.8	0.6	0.2	2				Y
	<i>Sambucus racemosa</i>	50.0	25.9	16.3	30	35				Y
	<i>Corylus cornuta</i>	50.0	24.2	15.0	25	35				Y
	<i>Lonicera hispidula</i>	50.0	2.1	1.3	0.2	5				Y
	<i>Vaccinium ovatum</i>	50.0	1.6	1.0	1	3				Y
	<i>Ribes sanguineum</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Rubus parviflorus</i>	25.0	2.4	1.5	6	6				
	<i>Ilex aquifolium</i>	25.0	0.8	0.5	2	2				
	<i>Garrya elliptica</i>	25.0	0.5	0.3	1	1				
	<i>Hedera helix</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Symphoricarpos albus</i>	25.0	0.1	0.1	0.2	0.2				
<i>Shrub (>.5m)</i>	25.0	0.1	0.1	0.2	0.2					

Pseudotsuga menziesii / *Corylus cornuta* / *Polystichum munitum* Association

Pseudotsuga menziesii – (*Notholithocarpus densiflorus* – *Arbutus menziesii*) Forest & Woodland Alliance

Herb	<i>Ceanothus thyrsiflorus</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Polystichum munitum</i>	100.0	55.9	13.3	3	25	Y	Y
	<i>Urtica dioica</i>	75.0	5.9	1.8	0.2	5		Y
	<i>Myosotis latifolia</i>	50.0	15.8	6.3	0.2	25		Y
	<i>Dryopteris arguta</i>	50.0	9.3	2.1	0.2	8		Y
	<i>Marah fabaceus</i>	50.0	1.3	0.1	0.2	0.2		Y
	<i>Galium aparine</i>	50.0	0.3	0.1	0.2	0.2		Y
	<i>Pteridium aquilinum</i>	25.0	3.6	1.3	5	5		
	<i>Elymus californicus</i>	25.0	2.3	0.5	2	2		
	<i>Maianthemum spp.</i>	25.0	1.2	0.1	0.2	0.2		
	<i>Cardamine oligosperma</i>	25.0	1.2	0.1	0.2	0.2		
	<i>Claytonia perfoliata</i>	25.0	1.2	0.1	0.2	0.2		
	<i>Cardamine californica</i>	25.0	1.1	0.3	1	1		
	<i>Trillium ovatum</i>	25.0	0.2	0.1	0.2	0.2		
	<i>Stachys ajugoides</i>	25.0	0.2	0.1	0.2	0.2		
	<i>Scoliopus bigelovii</i>	25.0	0.2	0.1	0.2	0.2		
<i>Epipactis helleborine</i>	25.0	0.1	0.1	0.2	0.2			
Non-Vascular	Moss	25.0	21.4	7.5	30	30		
	Lichen	25.0	3.6	1.3	5	5		

***Quercus (agrifolia, douglasii, garryana, kelloggii, lobata, wislizeni)* Forest & Woodland Alliance**



Common Name: Mixed oak forest and woodland

NVC Alliance Code: A0371. *Quercus agrifolia* - *Quercus douglasii* - *Quercus kelloggii*
Coastal Forest Alliance

Statewide Description

Quercus agrifolia, *Quercus douglasii*, *Quercus garryana*, *Quercus kelloggii*, *Quercus lobata* and/or *Quercus wislizeni* are co-dominant in the tree canopy with *Aesculus californica*, *Arbutus menziesii*, *Pinus sabiniana*, *Pseudotsuga menziesii*, and *Umbellularia californica*.

Allen et al. (1989, 1991) recognized a mixed oak series with 10 subseries; they based the subseries on the species composition of the woody plants since they lacked information on the herbaceous species. Their definition was followed in the 1995 edition of the *Manual of California Vegetation* (MCV) (Sawyer et al. 1995) and the subseries were listed as associations.

A careful study of the key (Allen et al. 1989, 1991) permitted some of the subseries to be placed in other alliances if the definitions allow the characteristic oak be co-dominant. For example, “valley oak and blue oak are co-dominant; coast live oak is present” becomes the *Quercus lobata* – *Quercus douglasii* Association in the *Quercus lobata* Alliance. The *Quercus wislizeni* – *Quercus douglasii* – *Pinus sabiniana* Association was placed in the

Quercus (agrifolia, douglasii, garryana, kelloggii, lobata, wislizeni) Woodland Alliance

Quercus wislizeni Alliance because the third tree is not an oak. However, some subseries remain within this alliance, specifically when three or more oaks co-dominate.

Local Vegetation Description

The Mixed oak forest and woodland Alliance forms an open to intermittent tree canopy with an open shrub understory. The dominant tree is *Quercus agrifolia* and *Quercus lobata*, and *Quercus douglasii*, *Aesculus californica*, and *Umbellularia californica* are characteristic or often present. Commonly associated shrubs include *Toxicodendron diversilobum*, *Artemisia californica*, *Baccharis pilularis*, *Diplacus aurantiacus*, and *Rhamnus crocea*, and commonly associated herbs include *Bromus hordeaceus*, *Carduus pycnocephalus*, *Geranium dissectum*, *Lolium perenne*, *Sanicula crassicaulis*, *Achillea millefolium*, *Avena* spp., *Centaurea solstitialis*, *Chlorogalum pomeridianum*, *Claytonia perfoliata*, *Elymus glaucus*, *Erodium botrys*, *Galium* spp., *Hordeum jubatum*, *Leymus* spp., *Lupinus* spp., *Monardella* spp., *Ranunculus* spp., *Vicia villosa*, *Wyethia glabra*, and *Wyethia* spp..

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	29.0	25 – 33	12.5	5 – 20
Regenerating or Shrubby Tree	0.0	0 – 0	5.5	2 – 10
Shrub	5.5	4.0 – 7.0	1.5	1 – 2
Herb	30.0	30 – 30	0.3	0 – 0.5

Local Membership Rule

Quercus agrifolia, *Quercus douglasii*, and/or *Quercus lobata* are present and these oak species typically co-dominate. Other oaks such as *Q. chrysolepis* and *Q. kelloggii* may also be present. This mixed type is for stands where multiple *Quercus* tree species intermix and it is difficult to assign to an alliance defined by one oak species – read steps to key to individual oak alliances below.

Local Environmental Description

Elevation: Mean 169 m, Range 143 – 195 m

Aspect: SW (1), Variable (1)

Slope: Mean 4 degrees, Range 2 – 6 degrees

Macro Topography: Middle to Upper 1/3 of slope (1), Ridge top (1)

Large Rock: Mean 0.6%, Range 0.2 – 1.0%

Small Rock: Mean 5.1%, Range 0.2 – 10.0%

Fines Cover: Mean 11.5%, Range 2.0 – 21.0%

Litter Cover: Mean 78.5%, Range 65.0 – 92%

Soil Texture (field assessed): Moderately fine clay loam (1), Medium to very fine, loamy sand (1)

Geology (field or map data): Metamorphic (type unknown) (1), Greenstone (1)

San Mateo County Watersheds: Palo Alto (2)

Quercus (agrifolia, douglasii, garryana, kelloggii, lobata, wislizeni) Woodland Alliance

Site Impacts

This alliance has moderate non-native plant cover (average 28.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Bromus hordeaceus*, *Carduus pycnocephalus*, *Centaurea solstitialis*, *Erodium botrys*, *Geranium dissectum*, and *Vicia villosa*.

Associations in San Mateo County

- *Quercus douglasii* – *Quercus lobata* – *Quercus agrifolia* / *Toxicodendron diversilobum*

Classification Comments

None.

References: Allen et al. 1989, Allen et al. 1991, Klein et al. 2015

Global Rarity Rank: G4 **State Rarity Rank:** S4

Surveys Used for Description

Total: N=2; San Mateo County (n=2): SCLAR151, SCLAR158

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree										
	<i>Quercus lobata</i>	100.0	37.1	13.5	7	20	Y		Y	Y
	<i>Quercus agrifolia</i>	100.0	33.2	11.0	10	12	Y		Y	Y
	<i>Quercus douglasii</i>	100.0	26.3	9.0	8	10	Y			Y
	<i>Umbellularia californica</i>	50.0	1.7	0.5	1	1				Y
	<i>Aesculus californica</i>	50.0	1.7	0.5	1	1				Y
Regenerating or Shrubby Trees										
	<i>Quercus agrifolia</i> *	50	16.7	0.1	0.2	0.2				Y
	<i>Quercus kelloggii</i> *	50	16.7	0.1	0.2	0.2				Y
	<i>Umbellularia californica</i> *50	50	16.7	0.1	0.2	0.2				Y
Shrub										
	<i>Toxicodendron diversilobum</i>	100.0	63.8	5.5	5	6	Y	Y		Y
	<i>Artemisia californica</i>	100.0	11.4	1.1	0.2	2	Y			Y
	<i>Baccharis pilularis</i>	50.0	13.5	1.0	2	2				Y

Quercus (agrifolia, douglasii, garryana, kelloggii, lobata, wislizeni) Woodland Alliance

	<i>Rhamnus crocea</i>	50.0	10.0	1.0	2	2		Y
	<i>Diplacus aurantiacus</i>	50.0	1.4	0.1	0.2	0.2		Y
	<i>Rhamnus crocea</i>	50	2.4	0.5	1.0	1.0		Y
Herb								
	<i>Bromus hordeaceus</i>	100.0	28.1	8.0	6	10	Y	Y
	<i>Carduus pycnocephalus</i>	100.0	16.8	5.0	2	8	Y	Y
	<i>Lolium perenne</i>	100.0	8.6	2.5	2	3	Y	Y
	<i>Sanicula crassicaulis</i>	100.0	6.9	2.0	2	2	Y	Y
	<i>Geranium dissectum</i>	100.0	3.7	1.1	0.2	2	Y	Y
	<i>Hordeum jubatum</i>	50.0	9.9	3.0	6	6		Y
	<i>Avena spp.</i>	50.0	10.9	3.0	6	6		Y
	<i>Elymus glaucus</i>	50.0	3.3	1.0	2	2		Y
	<i>Erodium botrys</i>	50.0	1.8	0.5	1	1		Y
	<i>Chlorogalum pomeridianum</i>	50.0	1.8	0.5	1	1		Y
	<i>Claytonia perfoliata</i>	50.0	1.6	0.5	1	1		Y
	<i>Achillea millefolium</i>	50.0	1.8	0.5	1	1		Y
	<i>Monardella spp.</i>	50.0	1.8	0.5	1	1		Y
	<i>Galium spp.</i>	50.0	0.4	0.1	0.2	0.2		Y
	<i>Wyethia glabra</i>	50.0	0.3	0.1	0.2	0.2		Y
	<i>Vicia villosa</i>	50.0	0.4	0.1	0.2	0.2		Y
	<i>Ranunculus spp.</i>	50.0	0.3	0.1	0.2	0.2		
	<i>Lupinus spp.</i>	50.0	0.4	0.1	0.2	0.2		
	<i>Leymus spp.</i>	50.0	0.4	0.1	0.2	0.2		
	<i>Centaurea solstitialis</i>	50.0	0.4	0.1	0.2	0.2		
	<i>Wyethia spp.</i>	50.0	0.4	0.1	0.2	0.2		
Non-Vascular								
	Lichen	50.0	50.0	1.0	2	2		Y

***Quercus douglasii* – *Quercus lobata* – *Quercus agrifolia* / *Toxicodendron diversilobum* Association**

Common Name: Blue Oak – Valley Oak – Coast Live Oak / Poison Oak Woodland

Alliance: *Quercus (agrifolia, douglasii, garryana, kelloggii, lobata, wislizeni)* Forest & Woodland Alliance

Classification Comments

The association circumscription is the same as that of the alliance for the county. See above for detailed description. Since the number of surveys of this association in San Mateo County is low, data from nearby counties were included.

References: Allen et al. 1989, Allen et al. 1991

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: N

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus lobata</i>	100.0	37.1	13.5	7	20			Y	Y
	<i>Quercus agrifolia</i>	100.0	33.2	11.0	10	12			Y	Y
	<i>Quercus douglasii</i>	100.0	26.3	9.0	8	10				Y
	<i>Umbellularia californica</i>	50.0	1.7	0.5	1	1				Y
	<i>Aesculus californica</i>	50.0	1.7	0.5	1	1				Y
Shrub	<i>Toxicodendron diversilobum</i>	100.0	63.8	5.5	5	6		Y		Y
	<i>Artemisia californica</i>	100.0	11.4	1.1	0.2	2				Y
	<i>Baccharis pilularis</i>	50.0	13.5	1.0	2	2				Y
	<i>Rhamnus crocea</i>	50.0	10.0	1.0	2	2				Y
	<i>Diplacus aurantiacus</i>	50.0	1.4	0.1	0.2	0.2				Y
Herb	<i>Bromus hordeaceus</i>	100.0	28.1	8.0	6	10	Y			Y
	<i>Carduus pycnocephalus</i>	100.0	16.8	5.0	2	8	Y			Y
	<i>Lolium perenne</i>	100.0	8.6	2.5	2	3	Y			Y
	<i>Sanicula crassicaulis</i>	100.0	6.9	2.0	2	2	Y			Y
	<i>Geranium dissectum</i>	100.0	3.7	1.1	0.2	2	Y			Y
	<i>Avena spp.</i>	50.0	10.9	3.0	6	6				Y
	<i>Hordeum jubatum</i>	50.0	9.9	3.0	6	6				Y
	<i>Elymus glaucus</i>	50.0	3.3	1.0	2	2				Y
	<i>Erodium botrys</i>	50.0	1.8	0.5	1	1				Y
	<i>Achillea millefolium</i>	50.0	1.8	0.5	1	1				Y

Quercus (agrifolia, douglasii, garryana, kelloggii, lobata, wislizeni) Woodland Alliance

	<i>Monardella spp.</i>	50.0	1.8	0.5	1	1	Y
	<i>Chlorogalum pomeridianum</i>	50.0	1.8	0.5	1	1	Y
	<i>Claytonia perfoliata</i>	50.0	1.6	0.5	1	1	Y
	<i>Lupinus spp.</i>	50.0	0.4	0.1	0.2	0.2	Y
	<i>Leymus spp.</i>	50.0	0.4	0.1	0.2	0.2	Y
	<i>Galium spp.</i>	50.0	0.4	0.1	0.2	0.2	Y
	<i>Vicia villosa</i>	50.0	0.4	0.1	0.2	0.2	
	<i>Centaurea solstitialis</i>	50.0	0.4	0.1	0.2	0.2	
	<i>Wyethia spp.</i>	50.0	0.4	0.1	0.2	0.2	
	<i>Wyethia glabra</i>	50.0	0.3	0.1	0.2	0.2	
	<i>Ranunculus spp.</i>	50.0	0.3	0.1	0.2	0.2	
Non-Vascular	Lichen	50.0	50.0	1.0	2	2	Y

***Quercus agrifolia* Forest & Woodland Alliance**



Common Name: Coast live oak woodland and forest

NVC Alliance Code: A3346. *Quercus agrifolia* Woodland Alliance

Statewide Description

Quercus agrifolia is dominant or co-dominant in the tree canopy with *Acer macrophyllum*, *Acer negundo*, *Arbutus menziesii*, *Juglans californica*, *Platanus racemosa*, *Populus fremontii*, *Quercus douglasii*, *Quercus engelmannii*, *Quercus kelloggii*, *Quercus lobata*, *Salix lasiolepis*, and *Umbellularia californica*.

Stands of this extensive alliance vary from upland savannas and woodlands to moist north-facing slope forests with closed tree canopies (Allen-Diaz et al. 2007). Genetic variation is high in the species, with two main recognized varieties. Most plants represent *Quercus agrifolia* var. *agrifolia*; plants recognized as *Quercus agrifolia* var. *oxyadenia* in the Peninsular Ranges of southern California have hairs completely covering the lower leaf surfaces (Roberts 1995). *Quercus agrifolia* hybrids include *Quercus* ×*ganderi* (*Q. agrifolia* var. *oxyadenia* × *Q. kelloggii*) in San Diego County and *Quercus* ×*chasei* (*Q. agrifolia* var. *agrifolia* × *Q. kelloggii*) in Monterey and Santa Cruz Counties. The species also hybridizes with *Quercus dumosa*, *Q. lobata*, and *Q. wislizeni* to varying degrees (Kathleen et al. 2002, Dodd et al. 1993, Brophy and Parnell 1974). A shrub form, *Quercus agrifolia* var. *frutescens*, may only represent frequently burned or salt-spray-pruned plants. See the mixed oak (*Quercus wislizeni* – *Quercus chrysolepis*) shrub alliance for that distinction.

Local Vegetation Description

The Coast live oak woodland and forest Alliance forms an open to continuous tree canopy with an open to continuous shrub understory. The dominant tree is *Quercus agrifolia*, and *Arbutus menziesii* are characteristic or often present. Commonly associated shrubs include *Toxicodendron diversilobum*, *Frangula californica*, *Lonicera hispidula*, and *Rubus ursinus*, and commonly associated herbs include *Dryopteris arguta*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	2.8	0 – 15	27.5	15 – 50
Hardwood	48.0	0 – 90	11.3	2 – 20
Regenerating or Shrubby Tree	2.5	0 – 85.0	1.9	0.5 – 5
Shrub	39.1	4.0 – 95.0	2.9	0 – 10
Herb	20.3	0 – 65	0.4	0 – 2

Local Membership Rule

Quercus agrifolia dominates or co-dominates with *Arbutus menziesii* in the canopy in an upland setting. If

Q. douglasii (or hybrid *Q. ×eplingii*), *Q. kelloggii*, *Q. lobata*, or *Umbellularia californica* is co-dominant to dominant, key to one of these other alliances instead of *Q. agrifolia*. The understory herbaceous layer often contains a mixture of native and non-native herbs and/or shrubs.

Local Environmental Description

Elevation: Mean 174 m, Range 48 – 382 m

Aspect: SW (4), NW (3), NE (1), SE (1)

Slope: Mean 13 degrees, Range 5 – 24 degrees

Macro Topography: Middle 1/3 of slope (3), Upper 1/3 of slope (2), Lower 1/3 of slope (1), Lower to Middle 1/3 of slope (1), Middle to Upper 1/3 of slope (1), Upper 1/3 of slope to Ridgetop (1)

Large Rock: Mean 1.0%, Range 0.0 – 12.0%

Small Rock: Mean 2.8%, Range 0.0 – 30.0%

Fines Cover: Mean 7.5%, Range 1.0 – 15.0%

Litter Cover: Mean 71.6%, Range 5.0 – 97%

Soil Texture (field assessed): Coarse, loamy sand (3), Coarse sand (1), Medium to very fine, sandy loam (1), Moderately coarse, sandy loam (1), Moderately fine sandy clay loam (1), Moderately fine silty clay loam (1), Unknown (1)

Geology (field or map data): Franciscan melange (9), Shale and other sedimentary (5), Sandstone and other sedimentary (4), Sandstone (3), Ultramafic rocks, mostly serpentine (3), Sandstone, shale, and gravel deposits (2), Volcanic and metavolcanic rocks (2), Granitic (1), Greenstone (1), Sedimentary (type unknown) (1), Shale (1)

San Mateo County Watersheds: San Mateo Bayside (29), Palo Alto (3), Half Moon Bay

Quercus agrifolia Woodland Alliance

(1), Pescadero Creek (1)

Site Impacts

This alliance has low non-native plant cover (average 3.2%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Avena* spp. and *Cynosurus echinatus*.

Associations in San Mateo County

- *Quercus agrifolia* – *Arbutus menziesii* – *Umbellularia californica*
- *Quercus agrifolia* – *Arbutus menziesii* / *Corylus cornuta* – *Rubus* spp.
- *Quercus agrifolia* – *Quercus kelloggii*
- *Quercus agrifolia* / *Arctostaphylos (crustacea)*
- *Quercus agrifolia* / grass
- *Quercus agrifolia* / *Toxicodendron diversilobum*

Classification Comments

None.

References: AECOM 2013, Allen et al. 1989, Buck and Evens 2010, Buck-Diaz and Evens 2011b, Evens and Kentner 2006, Evens and San 2004, Evens and San 2005, Keeler-Wolf and Evens 2006, Keeler-Wolf et al. 2003a, Kittel et al. 2012, Klein and Evens 2005, Klein et al. 2015, none, Shuford and Timossi 1989, Sproul et al. 2011, Wainwright and Barbour 1984

Global Rarity Rank: G5

State Rarity Rank: S4

Surveys Used for Description

Total: N=37; San Mateo County (n=37): GGNRA362, GGNRA376, PGA1019, PGA1037, PGA11797, PGA1800, PGA1810, PGA1813, PGA1814, PGA1825, PGA1838, PGA1840, PGA1841, PGA1842, PGA1851, PGA1868, PGA1869, PGA759, PGA766B, PGA767, PGA786, PGA788, PGA829, PGA942, PGA950, PGA995, PWCLO01A, PWMEF02, PWMEF03A, PWMEF04A, SCLAR147, SMAT0083, SMAT0089, SMAT0238, SMAT0247, SMAT0255, SMAT0329

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	97.3	72.0	39.9	3	90	Y	Y		Y
	<i>Arbutus menziesii</i>	51.4	9.8	5.7	0.2	62.5				Y
	<i>Umbellularia californica</i>	48.6	7.1	3.7	0.2	20				
	<i>Pseudotsuga menziesii</i>	32.4	3.5	1.8	0.2	12				
	<i>Quercus agrifolia</i> Woodland Alliance									

**Regenerating
or Shrubby
Trees**

<i>Quercus agrifolia</i> *	50	16.7	0.1	0.2	0.2			Y
<i>Quercus kelloggii</i> *	50	16.7	0.1	0.2	0.2			Y
<i>Umbellularia californica</i> *50	16.7	0.1	0.2	0.2				Y

Shrub

<i>Toxicodendron diversilobum</i>	94.6	43.7	19.4	3	85	Y	Y	Y
<i>Rubus ursinus</i>	70.3	12.0	6.1	0.2	45			Y
<i>Lonicera hispidula</i>	62.2	3.1	1.2	0.2	10			Y
<i>Frangula californica</i>	51.4	5.5	2.6	0.2	35			Y
<i>Heteromeles arbutifolia</i>	48.6	5.4	1.8	0.2	15			Y
<i>Baccharis pilularis</i>	29.7	6.1	4.0	0.2	60			Y
<i>Ceanothus thyrsiflorus</i>	27.0	2.8	1.2	0.2	15			
<i>Diplacus aurantiacus</i>	24.3	0.9	0.3	0.2	5			
<i>Toxicodendron diversilobum</i>	94.6	43.7	19.4	3	85			

Herb

<i>Dryopteris arguta</i>	56.8	14.2	2.7	0.2	20			Y
<i>Clinopodium douglasii</i>	48.6	5.5	0.8	0.2	5			
<i>Stachys ajugoides</i>	37.8	5.6	1.2	0.2	20			
<i>Sanicula crassicaulis</i>	37.8	2.7	0.6	0.2	10			
<i>Galium aparine</i>	32.4	1.3	0.2	0.2	3			
<i>Cynoglossum grande</i>	27.0	2.0	0.4	0.2	8			
<i>Iris douglasiana</i>	24.3	0.7	0.2	0.2	5			
<i>Polystichum munitum</i>	21.6	2.8	0.8	0.2	25			
<i>Elymus glaucus</i>	21.6	1.8	0.6	0.2	10			
<i>Pentagramma triangularis</i>	21.6	0.5	0.0	0.2	0.2			

***Quercus agrifolia* – *Arbutus menziesii* – *Umbellularia californica* Association**

Common Name: Coast Live Oak – Madrone – California Bay Woodland

Alliance: *Quercus agrifolia* Forest & Woodland Alliance

Local Vegetation Description

The Coast Live Oak – Madrone – California Bay Association forms an open to continuous tree canopy with an open to continuous shrub understory. The co-dominant trees are *Arbutus menziesii* and *Quercus agrifolia*, and *Umbellularia californica* is often present. Commonly associated shrubs include *Toxicodendron diversilobum*, *Frangula californica*, *Heteromeles arbutifolia*, *Lonicera hispidula*, and *Rubus ursinus*, and commonly associated herbs include *Dryopteris arguta*, *Sanicula crassicaulis*, and *Stachys ajugoides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	4.0	0 – 10	no data	no data
Hardwood	46.3	28 – 60	17.5	15 – 20
Regenerating or Shrubby Tree	0.1	0 – 0.8	0.8	0.5 – 1
Shrub	35.9	10.0 – 95.0	3.7	0 – 10
Herb	15.6	0 – 35	0.3	0 – 1

Local Environmental Description

Elevation: Mean 155 m, Range 72 – 235 m

Aspect: NW (1)

Slope: Mean 11 degrees, Range 11 – 11 degrees

Macro Topography: Middle to Upper 1/3 of slope (1)

Large Rock: Mean 4.0%, Range 0.0 – 12.0%

Small Rock: Mean 10.7%, Range 0.2 – 30.0%

Fines Cover: Mean 7.3%, Range 2.0 – 10.0%

Litter Cover: Mean 68.2%, Range 37.5 – 87%

Soil Texture (field assessed): Moderately fine sandy clay loam (1)

Geology (field or map data): Shale and other sedimentary (4), Sandstone (1), Ultramafic rocks, mostly serpentine (1), Sandstone and other sedimentary (1), Franciscan melange (1), Sandstone, shale, and gravel deposits (1)

San Mateo County Watersheds: San Mateo Bayside (9)

Site Impacts

This association has low non-native plant cover (average 2.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Avena* spp., *Brachypodium distachyon*, *Carduus pycnocephalus*, *Cynosurus echinatus*,
Quercus agrifolia – *Arbutus menziesii* – *Umbellularia californica* Association
Quercus agrifolia Woodland Alliance

Epipactis helleborine, and *Torilis arvensis*.

Classification Comments

None.

References: Evens and Kentner 2006, Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: G3 **State Rarity Rank:** S3 **State Rare:** Y

Surveys Used for Description

Total: N=9; San Mateo County (n=9): PGA1841, PGA1869, PGA767, PGA786, PGA942, PWCLO01A, PWMEF02, PWMEF03A, SMAT0329

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	100.0	46.4	25.9	3	48	Y	Y		Y
	<i>Arbutus menziesii</i>	100.0	31.3	18.3	2	62.5				Y
	<i>Umbellularia californica</i>	66.7	8.6	4.8	0.2	20				
	<i>Sequoia sempervirens</i>	44.4	5.1	2.7	1	10				
	<i>Aesculus californica</i>	22.2	3.0	0.6	2	3				
	<i>Pseudotsuga menziesii</i>	22.2	1.9	0.8	0.2	7				
	<i>Notholithocarpus densiflorus</i>	22.2	0.4	0.2	0.2	2				
	<i>Quercus spp.</i>	22.2	0.4	0.1	0.2	1				
	Shrub	<i>Toxicodendron diversilobum</i>	88.9	41.0	14.9	5	62.5			Y
<i>Heteromeles arbutifolia</i>		66.7	6.0	2.0	0.2	15				Y
<i>Rubus ursinus</i>		66.7	4.7	1.5	0.2	10				Y
<i>Lonicera hispidula</i>		55.6	3.6	1.8	0.2	10				Y
<i>Frangula californica</i>		55.6	3.6	1.8	0.2	10				Y
<i>Symphoricarpos albus</i>		44.4	3.6	1.2	0.2	10				Y
<i>Baccharis pilularis</i>		33.3	4.6	6.7	0.2	60				
<i>Diplacus aurantiacus</i>		33.3	2.1	0.7	0.2	5				
<i>Ceanothus thyrsiflorus</i>		22.2	4.1	1.6	2	12				
<i>Arctostaphylos spp.</i>		22.2	3.5	1.4	1	12				
<i>Rosa gymnocarpa</i>		22.2	2.5	0.4	0.2	3				
<i>Holodiscus discolor</i>		22.2	0.3	0.0	0.2	0.2				
Herb	<i>Dryopteris arguta</i>	66.7	17.4	2.9	0.2	15				Y

Quercus agrifolia – *Arbutus menziesii* – *Umbellularia californica* Association
Quercus agrifolia Woodland Alliance

<i>Stachys ajugoides</i>	55.6	9.2	2.3	0.2	20	Y
<i>Sanicula crassicaulis</i>	55.6	1.7	0.4	0.2	3	Y
<i>Clinopodium douglasii</i>	44.4	6.8	1.2	0.2	5	
<i>Pedicularis densiflora</i>	44.4	5.3	1.5	0.2	10	
<i>Torilis arvensis</i>	44.4	1.6	0.4	0.2	3	
<i>Galium aparine</i>	44.4	1.6	0.4	0.2	3	
<i>Pentagramma triangularis</i>	44.4	0.6	0.1	0.2	0.2	
<i>Cynosurus echinatus</i>	33.3	6.3	0.9	0.2	8	
<i>Melica torreyana</i>	33.3	2.0	0.6	0.2	5	
<i>Bromus laevipes</i>	33.3	1.9	0.4	0.2	3	
<i>Galium triflorum</i>	33.3	1.5	0.4	0.2	3	
<i>Polystichum munitum</i>	33.3	1.4	0.2	0.2	1	
<i>Cynoglossum grande</i>	33.3	1.4	0.2	0.2	1	
<i>Bromus carinatus</i>	33.3	1.3	0.4	0.2	3	
<i>Carduus pycnocephalus</i>	33.3	1.0	0.3	0.2	2	
<i>Madia madioides</i>	33.3	0.3	0.1	0.2	0.2	
<i>Iris douglasiana</i>	33.3	0.3	0.1	0.2	0.2	
<i>Elymus glaucus</i>	33.3	0.3	0.1	0.2	0.2	
<i>Melica spp.</i>	22.2	2.5	0.2	0.2	2	
<i>Adiantum jordanii</i>	22.2	1.8	0.4	0.2	3	
<i>Piperia spp.</i>	22.2	0.3	0.0	0.2	0.2	
<i>Brachypodium distachyon</i>	22.2	0.3	0.0	0.2	0.2	
<i>Epipactis helleborine</i>	22.2	0.3	0.0	0.2	0.2	
<i>Galium porrigens</i>	22.2	0.2	0.0	0.2	0.2	
<i>Avena spp.</i>	22.2	0.2	0.0	0.2	0.2	
<i>Osmorhiza berteroi</i>	22.2	0.2	0.0	0.2	0.2	
<i>Sanicula laciniata</i>	22.2	0.2	0.0	0.2	0.2	
<i>Fragaria vesca</i>	22.2	0.2	0.0	0.2	0.2	
Non-Vascular						
Moss	22.2	16.7	0.0	0.2	0.2	

***Quercus agrifolia* – *Arbutus menziesii* / *Corylus cornuta* – *Rubus* spp. Association**

Common Name: Coast Live Oak – Madrone / Hazel – Blackberry Woodland

Alliance: *Quercus agrifolia* Forest & Woodland Alliance

Local Vegetation Description

The Coast Live Oak – Madrone / Hazel – Blackberry Association forms an open to continuous tree canopy with an intermittent shrub understory. The dominant tree is *Quercus agrifolia*, and *Umbellularia californica* is often present. Commonly associated shrubs include *Corylus cornuta*, *Rubus ursinus*, *Toxicodendron diversilobum*, *Baccharis pilularis*, *Frangula californica*, *Heteromeles arbutifolia*, and *Lonicera hispidula*, and commonly associated herbs include *Clinopodium douglasii*, *Dryopteris arguta*, *Galium aparine*, *Polystichum munitum*, and *Stachys ajugoides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	3.8	0 – 15	42.5	35 – 50
Hardwood	32.0	8 – 65	no data	no data
Regenerating or Shrubby Tree	0.6	0 – 3.4	no data	no data
Shrub	57.5	45.0 – 65.0	2.4	0.5 – 5
Herb	33.8	20 – 60	0.6	0 – 2

Local Environmental Description

Elevation: Mean 110 m, Range 87 – 135 m

Aspect: SE (1), SW (1)

Slope: Mean 19 degrees, Range 18 – 20 degrees

Macro Topography: Lower 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 18.0%

Fines Cover: 2.7%

Litter Cover: 82%

Soil Texture (field assessed): Moderately coarse, sandy loam (1)

Geology (field or map data): Sandstone and other sedimentary (3), Sandstone, shale, and gravel deposits (1)

San Mateo County Watersheds: San Mateo Bayside (1)

Other Watersheds, Marin Co.: Bolinas (2), Lagunitas Creek (1)

Site Impacts

This association has low non-native plant cover (average 2.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*.

Quercus agrifolia – *Arbutus menziesii* / *Corylus cornuta* – *Rubus* spp. Association
Quercus agrifolia Woodland Alliance

Classification Comments

Since the number of surveys of this association in San Mateo County is low, data from nearby counties were included.

References: Allen et al. 1989, Keeler-Wolf et al. 2003a

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** N

Surveys Used for Description

Total: N=6; San Mateo County (n=1): PGA1868

Marin County (n=4): GGNRA385, PGA1713, PGA1716, SFANO04

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree										
	<i>Quercus agrifolia</i>	100.0	89.9	52.7	17	84.028	Y			Y
	<i>Umbellularia californica</i>	50.0	3.2	2.9	0.2	10				Y
	<i>Arbutus menziesii</i>	33.3	4.0	1.8	3	8				
Shrub										
	<i>Corylus cornuta</i>	100.0	42.5	20.8	4.86	1140		Y		Y
	<i>Rubus ursinus</i>	100.0	24.7	9.2	1	15.972				Y
	<i>Toxicodendron diversilobum</i>	100.0	11.1	5.9	1	15				Y
	<i>Baccharis pilularis</i>	66.7	10.9	6.7	0.2	20				Y
	<i>Lonicera hispidula</i>	50.0	4.6	1.7	2	5				Y
	<i>Heteromeles arbutifolia</i>	50.0	1.8	0.9	0.2	5				Y
	<i>Frangula californica</i>	50.0	1.2	0.7	0.2	4				Y
	<i>Symphoricarpos albus</i>	33.3	0.8	0.5	0.2	3				
	<i>Diplacus aurantiacus</i>	33.3	0.4	0.2	0.2	1				
Herb										
	<i>Dryopteris arguta</i>	50.0	18.8	4.7	5	18				Y
	<i>Polystichum munitum</i>	50.0	8.6	3.8	1	20				Y
	<i>Clinopodium douglasii</i>	50.0	2.5	0.4	0.2	2				Y
	<i>Galium aparine</i>	50.0	0.7	0.3	0.2	1.3333				Y
	<i>Stachys ajugoides</i>	50.0	0.3	0.1	0.2	0.2				Y
	<i>Maianthemum racemosum</i>	33.3	14.3	5.0	10	20				
	<i>Elymus glaucus</i>	33.3	3.6	0.4	0.2	2				

Quercus agrifolia – *Arbutus menziesii* / *Corylus cornuta* – *Rubus* spp. Association
Quercus agrifolia Woodland Alliance

<i>Pteridium aquilinum</i>	33.3	2.6	0.2	0.2	1
<i>Chlorogalum pomeridianum</i>	33.3	2.3	0.7	1.33333	3
<i>Fragaria vesca</i>	33.3	1.9	0.2	0.2	0.8667
<i>Osmorhiza berteroi</i>	33.3	1.6	0.1	0.2	0.2
<i>Forb (herbaceous, not grass nor grasslike)</i>	33.3	0.2	0.1	0.2	0.2
<i>Anagallis arvensis</i>	33.3	0.2	0.1	0.2	0.2
<i>Angelica hendersonii</i>	33.3	0.2	0.1	0.2	0.2

***Quercus agrifolia* – *Quercus kelloggii* Association**

Common Name: Coast Live Oak – Black Oak Woodland

Alliance: *Quercus agrifolia* Forest & Woodland Alliance

Local Vegetation Description

The Coast Live Oak – Black Oak Association forms a continuous tree canopy with an open shrub understory. The dominant tree is *Quercus agrifolia*, and *Quercus kelloggii*, *Quercus douglasii*, *Quercus lobata*, and *Umbellularia californica* are characteristic or often present. Regenerating or shrubby trees that are often present include *Quercus agrifolia*, *Quercus kelloggii*, and *Umbellularia californica*.

Commonly associated shrubs include *Lonicera hispidula*, *Toxicodendron diversilobum*, *Heteromeles arbutifolia*, *Rhamnus crocea*, *Sambucus nigra*, and *Symphoricarpos mollis*, and commonly associated herbs include *Avena* spp., *Briza maxima*, *Carduus pycnocephalus*, *Cynosurus echinatus*, and *Sanicula crassicaulis*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	73.0	71 – 75	15.0	10 – 20
Regenerating or Shrubby Tree	0.3	0 – 0.6	2.1	0.5 – 5
Shrub	9.6	3 – 16.0	1.9	0 – 5
Herb	29.5	14 – 45	0.5	0 – 1

Local Environmental Description

Elevation: Mean 168 m, Range 164 – 172 m

Aspect: SW (1), NE (1)

Slope: Mean 13 degrees, Range 7 – 19 degrees

Macro Topography: Upper 1/3 of slope to Ridgetop (1), Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.2%

Fines Cover: Mean 5.1%, Range 0.2 – 10.0%

Litter Cover: Mean 91.5%, Range 87.0 – 96%

Soil Texture (field assessed): Medium to very fine, sandy loam (1), Coarse, loamy sand (1)

Geology (field or map data): Sandstone and other sedimentary (1), Shale and other sedimentary (1)

San Mateo County Watersheds: Palo Alto (1)

Other Watersheds, Marin Co.: Novato (1)

Site Impacts

This association has moderate non-native plant cover (average 20.4%) relative to native

Quercus agrifolia – *Quercus kelloggii* Association
Quercus agrifolia Woodland Alliance

cover. Non- native species that occur with highest frequency and abundance include *Avena* spp., *Briza maxima*, *Bromus diandrus*, *Bromus madritensis*, *Carduus pycnocephalus*, *Cynosurus echinatus*, *Lolium perenne* ssp. *multiflorum*, and *Torilis arvensis*.

Classification Comments

Since the number of surveys of this association in San Mateo County is low, data from nearby counties were included.

References: Buck and Evens 2010, Evens and San 2005, Wainwright and Barbour 1984

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=2; San Mateo County (n=1): SMAT0247

Marin County (n=1): MOSD0163

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	100.0	60.2	45.0	40	50		Y		Y
	<i>Quercus kelloggii</i>	100.0	18.1	14.0	8	20				Y
	<i>Umbellularia californica</i>	50.0	12.5	10.0	20	20				Y
	<i>Quercus douglasii</i>	50.0	5.6	4.0	8	8				Y
	<i>Quercus lobata</i>	50.0	3.5	2.5	5	5				Y
Regenerating or Shrubby Trees	<i>Quercus agrifolia</i>	50.0	16.7	0.1	0.2	0.2				Y
	<i>Quercus kelloggii</i>	50.0	16.7	0.1	0.2	0.2				Y
	<i>Umbellularia californica</i>	50.0	16.7	0.1	0.2	0.2				Y
Shrub	<i>Lonicera hispidula</i>	100.0	49.3	2.0	1	3			Y	Y
	<i>Toxicodendron diversilobum</i>	100.0	26.9	5.1	0.2	10				Y
	<i>Symphoricarpos mollis</i>	50.0	11.9	2.5	5	5				Y
	<i>Heteromeles arbutifolia</i>	50.0	4.8	1.0	2	2				Y
	<i>Sambucus nigra</i>	50.0	4.8	1.0	2	2				Y
	<i>Rhamnus crocea</i>	50.0	2.4	0.5	1	1				Y

Quercus agrifolia – *Quercus kelloggii* Association
Quercus agrifolia Woodland Alliance

Herb

<i>Briza maxima</i>	100.0	25.7	10.1	0.2	20	Y
<i>Carduus pycnocephalus</i>	100.0	16.0	3.5	2	5	Y
<i>Avena spp.</i>	100.0	7.4	1.5	1	2	Y
<i>Sanicula crassicaulis</i>	100.0	1.2	0.2	0.2	0.2	Y
<i>Bromus diandrus</i>	50.0	12.4	5.0	10	10	Y
<i>Bromus madritensis</i>	50.0	1.2	0.5	1	1	Y
<i>Lolium perenne</i>	50.0	1.0	0.1	0.2	0.2	Y
<i>Elymus glaucus</i>	50.0	1.0	0.1	0.2	0.2	Y
<i>Chlorogalum pomeridianum</i>	50.0	1.0	0.1	0.2	0.2	Y
<i>Galium porrigens</i>	50.0	1.0	0.1	0.2	0.2	Y
<i>Bromus carinatus</i>	50.0	1.0	0.1	0.2	0.2	Y
<i>Pedicularis densiflora</i>	50.0	1.0	0.1	0.2	0.2	Y
<i>Achillea millefolium</i>	50.0	1.0	0.1	0.2	0.2	Y
<i>Torilis arvensis</i>	50.0	1.0	0.1	0.2	0.2	Y
<i>Perideridia kelloggii</i>	50.0	1.0	0.1	0.2	0.2	Y
<i>Galium spp.</i>	50.0	0.2	0.1	0.2	0.2	Y

Non-Vascular

Lichen	50.0	25.0	0.1	0.2	0.2	Y
Moss	50.0	25.0	0.1	0.2	0.2	Y

***Quercus agrifolia* / *Arctostaphylos (crustacea)* Provisional Association**

Common Name: Coast Live Oak / Brittle Leaf Manzanita Woodland

Alliance: *Quercus agrifolia* Forest & Woodland Alliance

Local Vegetation Description

The Coast Live Oak / Brittle Leaf Manzanita Association forms an intermittent tree canopy with an open to intermittent shrub understory. The dominant tree is *Quercus agrifolia*, and *Arbutus menziesii*, *Pseudotsuga menziesii*, and *Quercus wislizeni* are characteristic or often present. Regenerating or shrubby trees that are often present include *Quercus agrifolia*. Commonly associated shrubs include *Arctostaphylos crustacea*, *Arctostaphylos regismontana*, *Ceanothus thyrsiflorus*, *Diplacus aurantiacus*, *Genista monspessulana*, *Heteromeles arbutifolia*, *Lonicera hispidula*, *Rosa* spp., *Toxicodendron diversilobum*, *Vaccinium ovatum*, and commonly associated herbs include *Aira caryophyllea*, *Avena* spp., *Briza maxima*, *Hordeum murinum*, *Iris douglasiana*, *Juncus patens*, *Lolium perenne* ssp. *multiflorum*, *Luzula comosa*, *Nassella pulchra*, *Pedicularis densiflora*, *Pentagramma triangularis*, *Pteridium aquilinum*, *Sisyrinchium bellum*, and *Trifolium* spp.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	5.0	0 – 10	25.0	15 – 35
Hardwood	30.0	25 – 35	3.5	2 – 5
Regenerating or Shrubby Tree	2.6	0 – 5.2	1.5	1 – 2
Shrub	32.5	25.0 – 40.0	2.5	1 – 5
Herb	14.0	10 – 18	0.8	0 – 2

Local Environmental Description

Elevation: 244 m

Aspect: NW (1)

Slope: 5 degrees

Macro Topography: Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: 15.0%

Litter Cover: 82%

Soil Texture (field assessed): Medium to very fine, sandy loam (1)

Geology (field or map data): Sandstone (1)

San Mateo County Watersheds: San Mateo Bayside (1)

Site Impacts

This association has low non-native plant cover (average 5.2%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Briza maxima* and *Genista monspessulana*.

Classification Comments

This association is considered provisional since it is under-sampled in its expected range. It is newly described here. Due to hybridization and morphological similarity between the species, plants identified as *Quercus wislizeni* may be *Quercus parvula*, which has been found to be the most widespread genotype in San Mateo County (Dodd and Afzul-Rafii 2004, Hauser et al. 2017).

References: none

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=2; San Mateo County (n=2): PGA829, SMAT0083

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	100.0	79.0	30.0	25	35		Y		Y
	<i>Arbutus menziesii</i>	100.0	6.5	2.6	0.2	5				Y
	<i>Pseudotsuga menziesii</i>	50.0	14.2	5.0	10	10				Y
	<i>Quercus wislizeni</i>	50.0	0.2	0.1	0.2	0.2				Y
Regenerating or Shrubby Trees	<i>Quercus agrifolia</i>	50.0	50.0	2.6	5.2	5.2				Y
Shrub	<i>Arctostaphylos crustacea</i>	100.0	55.8	22.5	5	40				Y
	<i>Arctostaphylos regismontana</i>	50.0	26.2	10.0	20	20				Y
	<i>Ceanothus thyrsiflorus</i>	50.0	10.5	4.0	8	8				Y
	<i>Toxicodendron diversilobum</i>	50.0	3.9	1.5	3	3				Y
	<i>Heteromeles arbutifolia</i>	50.0	1.3	0.5	1	1				Y
	<i>Diplacus aurantiacus</i>	50.0	1.3	0.5	1	1				Y
	<i>Genista monspessulana</i>	50.0	0.3	0.1	0.2	0.2				Y

Quercus agrifolia / *Arctostaphylos (crustacea)* Provisional Association
Quercus agrifolia Woodland Alliance

	<i>Vaccinium ovatum</i>	50.0	0.2	0.1	0.2	0.2	Y
	<i>Lonicera hispidula</i>	50.0	0.2	0.1	0.2	0.2	Y
	<i>Rosa spp.</i>	50.0	0.2	0.1	0.2	0.2	Y
Herb							
	<i>Pteridium aquilinum</i>	50.0	50.0	9.0	18	18	Y
	<i>Briza maxima</i>	50.0	14.9	2.5	5	5	Y
	<i>Lolium perenne</i>	50.0	6.0	1.0	2	2	Y
	<i>Aira caryophyllea</i>	50.0	6.0	1.0	2	2	Y
	<i>Luzula comosa</i>	50.0	6.0	1.0	2	2	Y
	<i>Nassella pulchra</i>	50.0	3.0	0.5	1	1	Y
	<i>Trifolium spp.</i>	50.0	3.0	0.5	1	1	Y
	<i>Avena spp.</i>	50.0	3.0	0.5	1	1	Y
	<i>Sisyrinchium bellum</i>	50.0	3.0	0.5	1	1	Y
	<i>Juncus patens</i>	50.0	3.0	0.5	1	1	Y
	<i>Iris douglasiana</i>	50.0	0.6	0.1	0.2	0.2	Y
	<i>Pedicularis densiflora</i>	50.0	0.6	0.1	0.2	0.2	Y
	<i>Pentagramma triangularis</i>	50.0	0.6	0.1	0.2	0.2	Y
	<i>Hordeum murinum</i>	50.0	0.6	0.1	0.2	0.2	Y
Non-Vascular							
	Lichen	50.0	50.0	0.1	0.2	0.2	Y

***Quercus agrifolia* / grass Association**

Common Name: California Live Oak / Annual Grass-Herb Woodland

Woodland Alliance: *Quercus agrifolia* Forest & Woodland Alliance

Local Vegetation Description

The California Live Oak / Annual Grass-Herb Woodland Association forms an intermittent tree canopy with an open shrub understory. The dominant tree is *Quercus agrifolia*, and *Umbellularia californica* is often present. Commonly associated shrubs include *Toxicodendron diversilobum*, and commonly associated herbs include *Avena* spp., *Briza maxima*, *Bromus diandrus*, *Carduus pycnocephalus*, and *Elymus glaucus*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	42.5	40 – 45	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	9.5	4.0 – 15.0	no data	no data
Herb	65.0	65 – 65	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 69 m, Range 48 – 89 m

Aspect: no data

Slope: no data

Macro Topography: no data

Large Rock: no data

Small Rock: no data

Fines Cover: no data

Litter Cover: no data

Soil Texture (field assessed): no data

Geology (field or map data): Franciscan melange (1), Ultramafic rocks, mostly serpentine (1)

San Mateo County Watersheds: San Mateo Bayside (2)

Site Impacts

This association has low non-native plant cover (average 12.8%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Avena* spp., *Brachypodium distachyon*, *Briza maxima*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Cynosurus echinatus*, *Erodium botrys*, and *Lolium perenne* ssp. *multiflorum*.

Classification Comments

Quercus agrifolia / grass Association
Quercus agrifolia Woodland Alliance

None.

References: AECOM 2013, Allen et al. 1989, Evens and Kentner 2006, Evens and San 2005, Keeler- Wolf and Evens 2006, Kittel et al. 2012, Klein and Evens 2005, Klein et al. 2015, Shuford and Timossi 1989

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: N

Surveys Used for Description

Total: N=2; San Mateo County (n=2): PGA1037, PGA1840

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	100.0	81.9	35.0	30	40		Y		Y
	<i>Umbellularia californica</i>	50.0	12.5	5.0	10	10				Y
	<i>Arbutus menziesii</i>	50.0	5.6	2.5	5	5				Y
Shrub	<i>Toxicodendron diversilobum</i>	100.0	60.3	4.0	3	5				Y
	<i>Lonicera hispidula</i>	100.0	11.0	1.1	0.2	2				Y
	<i>Heteromeles arbutifolia</i>	50.0	20.8	2.5	5	5				Y
	<i>Baccharis pilularis</i>	50.0	2.6	0.1	0.2	0.2				Y
	<i>Ceanothus thyrsiflorus</i>	50.0	2.6	0.1	0.2	0.2				Y
	<i>Rubus ursinus</i>	50.0	2.6	0.1	0.2	0.2				Y
Herb	<i>Elymus glaucus</i>	100.0	14.1	7.5	5	10				Y
	<i>Pedicularis densiflora</i>	50.0	15.4	7.5	15	15				Y
	<i>Lolium perenne</i>	50.0	15.3	10.0	20	20				Y
	<i>Agrostis spp.</i>	50.0	11.5	7.5	15	15				Y
	<i>Cynoglossum grande</i>	50.0	8.2	4.0	8	8				Y
	<i>Bromus carinatus</i>	50.0	8.2	4.0	8	8				Y
	<i>Danthonia californica</i>	50.0	7.6	5.0	10	10				Y
	<i>Iris douglasiana</i>	50.0	5.1	2.5	5	5				Y
	<i>Cirsium vulgare</i>	50.0	3.8	2.5	5	5				Y
	<i>Symphotrichum chilense</i>	50.0	3.8	2.5	5	5				Y
	<i>Avena spp.</i>	50.0	3.8	2.5	5	5				Y
	<i>Festuca rubra</i>	50.0	2.1	1.0	2	2				Y
	<i>Clinopodium douglasii</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Artemisia douglasiana</i>	50.0	0.2	0.1	0.2	0.2				Y
<i>Sanicula crassicaulis</i>	50.0	0.2	0.1	0.2	0.2				Y	

Quercus agrifolia / grass Association
Quercus agrifolia Woodland Alliance

<i>Chlorogalum pomeridianum</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Galium californicum</i>	50.0	0.2	0.1	0.2	0.2	Y

***Quercus agrifolia* / *Toxicodendron diversilobum* Association**

Common Name: Coast Live Oak / Poison-oak Woodland

Alliance: *Quercus agrifolia* Forest & Woodland Alliance

Local Vegetation Description

The Coast Live Oak / Poison-oak Association forms an open to continuous tree canopy with an open to continuous shrub understory. The dominant tree is *Quercus agrifolia*. Commonly associated shrubs include *Toxicodendron diversilobum*, *Rubus ursinus*, *Frangula californica*, and *Lonicera hispidula*, and commonly associated herbs include *Clinopodium douglasii* and *Dryopteris arguta*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	1.8	0 – 10	21.3	15 – 35
Hardwood	52.0	0 – 90	12.0	5 – 20
Regenerating or Shrubby Tree	4.0	0 – 85.0	2.5	1 – 5
Shrub	44.4	7.0 – 85.0	2.7	0 – 5
Herb	18.6	0 – 65	0.3	0 – 1

Local Environmental Description

Elevation: Mean 192 m, Range 93 – 382 m

Aspect: SW (4), SE (1), NW (1)

Slope: Mean 16 degrees, Range 5 – 24 degrees

Macro Topography: Middle 1/3 of slope (2), Upper 1/3 of slope (2), Lower 1/3 of slope (1), Lower to Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: Mean 0.1%, Range 0.0 – 0.4%

Fines Cover: Mean 5.6%, Range 1.0 – 10.0%

Litter Cover: Mean 69.4%, Range 5.0 – 97%

Soil Texture (field assessed): Coarse, loamy sand (2), Moderately fine silty clay loam (1), Moderately coarse, sandy loam (1), Coarse sand (1)

Geology (field or map data): Franciscan melange (7), Sandstone and other sedimentary (3), Volcanic and metavolcanic rocks (2), Ultramafic rocks, mostly serpentine (1), Shale (1), Sandstone (1), Granitic (1), Sedimentary (type unknown) (1), Greenstone (1)

San Mateo County Watersheds: San Mateo Bayside (16), Palo Alto (2), Half Moon Bay (1), Pescadero Creek (1)

Site Impacts

This association has low non-native plant cover (average 2.5%) relative to native cover.

Quercus agrifolia / *Toxicodendron diversilobum* Association
Quercus agrifolia Woodland Alliance

Non-native species that occur with highest frequency and abundance include *Galium aparine*.

Classification Comments

None.

References: AECOM 2013, Allen et al. 1989, Evens and Kentner 2006, Evens and San 2004, Evens and San 2005, Keeler-Wolf and Evens 2006, Keeler-Wolf et al. 2003a, Kittel et al. 2012, Klein and Evens 2005, Klein et al. 2015, Sproul et al. 2011

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** N

Surveys Used for Description

Total: N=22; San Mateo County (n=22): GGNRA362, GGNRA376, PGA1019, PGA11797, PGA1800, PGA1810, PGA1813, PGA1814, PGA1825, PGA1838, PGA1842, PGA1851, PGA759, PGA766B, PGA788, PGA950, PGA995, PWMEF04A, SCLAR147, SMAT0089, SMAT0238, SMAT0255

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	95.5	81.4	45.9	15	90		Y		Y
	<i>Umbellularia californica</i>	45.5	6.8	3.3	0.2	15				
	<i>Pseudotsuga menziesii</i>	40.9	3.8	2.2	0.2	12				
	<i>Arbutus menziesii</i>	27.3	2.1	1.2	0.2	20				
Shrub	<i>Toxicodendron diversilobum</i>	100.0	48.0	25.0	5	85			Y	Y
	<i>Rubus ursinus</i>	81.8	17.4	9.3	0.2	45				Y
	<i>Frangula californica</i>	59.1	7.5	3.5	0.2	35				Y
	<i>Lonicera hispidula</i>	59.1	2.2	0.8	0.2	5				Y
	<i>Heteromeles arbutifolia</i>	40.9	4.2	1.8	0.2	10				
	<i>Baccharis pilularis</i>	31.8	8.1	4.0	0.2	25				
	<i>Ceanothus thyrsiflorus</i>	22.7	1.9	0.9	0.2	15				
	<i>Diplacus aurantiacus</i>	22.7	0.6	0.2	0.2	3				
Herb	<i>Dryopteris arguta</i>	63.6	12.8	2.5	0.2	20				Y
	<i>Clinopodium douglasii</i>	54.5	6.4	0.7	0.2	5				Y
	<i>Stachys ajugoides</i>	36.4	5.5	1.1	0.2	7				
	<i>Galium aparine</i>	36.4	1.6	0.2	0.2	3				
	<i>Marah fabaceus</i>	31.8	5.0	0.4	0.2	5				

Quercus agrifolia / *Toxicodendron diversilobum* Association
Quercus agrifolia Woodland Alliance

<i>Sanicula crassicaulis</i>	31.8	3.8	0.8	0.2	10
<i>Cynoglossum grande</i>	27.3	2.1	0.2	0.2	2
<i>Scrophularia californica</i>	27.3	1.4	0.2	0.2	2
<i>Pteridium aquilinum</i>	22.7	1.4	0.4	0.2	5

***Quercus chrysolepis* (tree) Forest & Woodland Alliance**



Common Name: Canyon live oak forest and woodland

NVC Alliance Code: A3349. *Quercus chrysolepis* - *Quercus kelloggii* Forest & Woodland Alliance

Statewide Description

Quercus chrysolepis is dominant or co-dominant in the tree canopy with *Abies concolor*, *Acer macrophyllum*, *Arbutus menziesii*, *Calocedrus decurrens*, *Notholithocarpus densiflorus*, *Pinus coulteri*, *Pinus lambertiana*, *Pinus monophylla*, *Pinus ponderosa*, *Pseudotsuga menziesii*, *Quercus garryana* var. *garryana*, *Quercus kelloggii*, *Quercus wislizeni*, and *Umbellularia californica*.

Quercus chrysolepis grows on the east side of the Sierra Nevada, in the Mojave Desert, and in most of cismontane California typically at middle and upper elevations (Griffin and Critchfield 1972). *Quercus chrysolepis* is present in many different alliances and it shares dominance with several other tree species in this alliance (Allen-Diaz et al. 2007). Most *Quercus chrysolepis* stands that are free of recent major disturbance have trees of all sizes and all ages (Tirmenstein 1989b, Thornburgh 1990b).

Local Vegetation Description

The Canyon live oak forest and woodland Alliance forms an intermittent to continuous tree canopy with a sparse to open shrub understory. The dominant tree is *Quercus chrysolepis*, and *Quercus agrifolia*, *Umbellularia californica*, and *Pseudotsuga menziesii*

are characteristic or often present. Regenerating or shrubby trees that are dominant and characteristic include *Pseudotsuga menziesii*, *Quercus agrifolia*, *Quercus chrysolepis*, and *Umbellularia californica* and those that are often present include *Arbutus menziesii* and *Notholithocarpus densiflorus*. Commonly associated shrubs include *Rubus ursinus*, *Lonicera hispidula*, *Rosa gymnocarpa*, *Toxicodendron diversilobum*, *Corylus cornuta*, and *Symphoricarpos albus*, and commonly associated herbs include *Osmorhiza berteroi*, *Sanicula crassicaulis*, *Claytonia perfoliata*, *Clinopodium douglasii*, *Dryopteris arguta*, *Fragaria vesca*, *Iris* spp., *Lathyrus vestitus*, *Madia madioides*, *Stachys ajugoides*, and *Torilis arvensis*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	7.5	0 – 15	27.5	20 – 35
Hardwood	65.0	55 – 75	18.8	10 – 35
Regenerating or Shrubby Tree	4.3	0.8 – 7.8	3.0	1 – 5
Shrub	8.8	0.0 – 26.0	0.8	0.5 – 1
Herb	4.6	0.2 – 10	0.4	0 – 1

Local Membership Rule

Quercus chrysolepis is dominant or co-dominant with *Arbutus menziesii* or *Umbellularia californica* in the tree overstory. *Quercus wislizeni* is occasionally found as a sub-dominant tree.

Local Environmental Description

Elevation: Mean 702 m, Range 654 – 755 m

Aspect: SW (2), NE (1), SE (1)

Slope: Mean 19 degrees, Range 15 – 22 degrees

Macro Topography: Upper 1/3 of slope (3), Middle 1/3 of slope (1)

Large Rock: Mean 0.2%, Range 0.0 – 0.6%

Small Rock: Mean 0.2%, Range 0.0 – 0.4%

Fines Cover: Mean 6.6%, Range 0.2 – 20.0%

Litter Cover: Mean 90.8%, Range 79.0 – 97%

Soil Texture (field assessed): Moderately fine silty clay loam (3), Medium to very fine, loamy sand (1)

Geology (field or map data): Sandstone (4)

San Mateo County Watersheds: Pescadero Creek (2), Palo Alto (1), San Gregorio Creek (1)

Site Impacts

This alliance has very low non-native plant cover (average 0.3%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Cynosurus echinatus*, *Stellaria media*, *Torilis arvensis*, and *Vicia sativa*.

Associations in San Mateo County

- *Quercus chrysolepis* – *Umbellularia californica*
Quercus chrysolepis (tree) Woodland Alliance

- *Quercus chrysolepis* / *Quercus (wislizeni, parvula)*
- *Quercus chrysolepis*

Classification Comments

None.

References: Campbell 1980, Evens and Kentner 2006, Keeler-Wolf et al. 2003b, Klein et al. 2007, Klein et al. 2015, Reyes et al. 2020a, NPS-SEKI 2009, VegCAMP 2015a

Global Rarity Rank: G5

State Rarity Rank: S5

Surveys Used for Description

Total: N=4; San Mateo County (n=4): SMAT0001, SMAT0257, SMAT0260, SMAT0286

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus chrysolepis</i>	100.0	71.6	50.8	25	73	Y	Y		Y
	<i>Umbellularia californica</i>	100.0	7.4	5.3	2	10	Y			Y
	<i>Quercus agrifolia</i>	75.0	1.2	0.9	0.2	3	Y			Y
	<i>Pseudotsuga menziesii</i>	50.0	10.6	7.5	15	15				Y
	<i>Quercus parvula</i> var. <i>shrevei</i>	25.0	9.0	6.3	25	25				
	<i>Acer macrophyllum</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Quercus lobata</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Aesculus californica</i>	25.0	0.1	0.1	0.2	0.2				
	Regenerating or Shrubby Trees	<i>Quercus chrysolepis</i>	100.0	24.7	1.0	0.2	2.2	Y		
<i>Umbellularia californica</i>		100.0	21.5	0.8	0.2	1.2	Y			Y
<i>Pseudotsuga menziesii</i>		75.0	22.1	1.4	0.2	3.2	Y			Y
<i>Quercus agrifolia</i>		75.0	8.5	0.2	0.2	0.4	Y			Y
<i>Notholithocarpus densiflorus</i>		50.0	9.5	0.3	0.2	1				Y
<i>Arbutus menziesii</i>		50.0	9.5	0.3	0.2	1				Y

Quercus chrysolepis (tree) Woodland Alliance

	<i>Quercus parvula</i> var. <i>shrevei</i>	25.0	4.3	0.3	1.2	1.2			
Shrub									
	<i>Rubus ursinus</i>	75.0	35.7	5.5	1	20	Y	Y	Y
	<i>Toxicodendron diversilobum</i>	75.0	22.0	1.8	0.2	5	Y		Y
	<i>Lonicera hispidula</i>	75.0	5.3	0.6	0.2	2	Y		Y
	<i>Rosa gymnocarpa</i>	75.0	3.7	0.2	0.2	0.2	Y		Y
	<i>Symphoricarpos albus</i>	50.0	2.5	0.6	0.2	2			Y
	<i>Corylus cornuta</i>	50.0	0.9	0.1	0.2	0.2			Y
	<i>Salix lasiolepis</i>	25.0	0.2	0.1	0.2	0.2			
	<i>Symphoricarpos mollis</i>	25.0	2.8	0.1	0.2	0.2			
	<i>Rubus parviflorus</i>	25.0	0.2	0.1	0.2	0.2			
	<i>Ribes sanguineum</i>	25.0	0.7	0.1	0.2	0.2			
	<i>Holodiscus discolor</i>	25.0	0.2	0.1	0.2	0.2			
	<i>Heteromeles arbutifolia</i>	25.0	0.7	0.1	0.2	0.2			
	<i>Sambucus nigra</i>	25.0	0.2	0.1	0.2	0.2			
Herb									
	<i>Sanicula crassicaulis</i>	75.0	8.4	0.2	0.2	0.2	Y		Y
	<i>Osmorhiza berteroi</i>	75.0	8.4	0.2	0.2	0.2	Y		Y
	<i>Clinopodium douglasii</i>	50.0	15.5	0.3	0.2	1			Y
	<i>Iris spp.</i>	50.0	3.7	0.1	0.2	0.2			Y
	<i>Madia madioides</i>	50.0	4.2	0.1	0.2	0.2			Y
	<i>Lathyrus vestitus</i>	50.0	4.2	0.1	0.2	0.2			Y
	<i>Dryopteris arguta</i>	50.0	3.7	0.1	0.2	0.2			Y
	<i>Stachys ajugoides</i>	50.0	4.2	0.1	0.2	0.2			Y
	<i>Fragaria vesca</i>	50.0	3.7	0.1	0.2	0.2			Y
	<i>Claytonia perfoliata</i>	50.0	5.6	0.1	0.2	0.2			Y
	<i>Torilis arvensis</i>	50.0	4.2	0.1	0.2	0.2			Y
	<i>Pentagramma triangularis</i>	25.0	1.5	0.1	0.2	0.2			
	<i>Vicia sativa</i>	25.0	2.3	0.1	0.2	0.2			
	<i>Triteleia laxa</i>	25.0	1.5	0.1	0.2	0.2			
	<i>Marah fabaceus</i>	25.0	2.3	0.1	0.2	0.2			
	<i>Stellaria media</i>	25.0	1.5	0.1	0.2	0.2			
	<i>Iris fernaldii</i>	25.0	4.2	0.1	0.2	0.2			
	<i>Galium aparine</i>	25.0	1.5	0.1	0.2	0.2			
	<i>Elymus glaucus</i>	25.0	2.8	0.1	0.2	0.2			
	<i>Cynoglossum grande</i>	25.0	1.5	0.1	0.2	0.2			
	<i>Cynosurus echinatus</i>	25.0	2.8	0.1	0.2	0.2			
	<i>Collinsia heterophylla</i>	25.0	1.5	0.1	0.2	0.2			
	<i>Bromus vulgaris</i>	25.0	1.5	0.1	0.2	0.2			
	<i>Artemisia douglasiana</i>	25.0	2.3	0.1	0.2	0.2			
	<i>Fritillaria affinis</i>	25.0	4.2	0.1	0.2	0.2			
	<i>Iris macrosiphon</i>	25.0	2.8	0.1	0.2	0.2			
Non-Vascular									
	Moss	75.0	47.7	0.6	0.2	2	Y	Y	Y
	<i>Quercus chrysolepis</i> (tree) Woodland Alliance								

Lichen

75.0

27.3

0.2

0.2

0.2

Y

Y

***Quercus chrysolepis* – *Umbellularia californica* Association**

Common Name: Canyon Live Oak – California Bay Woodland

Alliance: *Quercus chrysolepis* (tree) Forest & Woodland Alliance

Local Vegetation Description

The Canyon Live Oak – California Bay Association forms an intermittent to continuous tree canopy with a sparse to open shrub understory. The dominant tree is *Quercus chrysolepis*, and *Umbellularia californica* and *Quercus agrifolia* are often present. Regenerating or shrubby trees that are often present include *Notholithocarpus densiflorus*, *Pseudotsuga menziesii*, and *Quercus chrysolepis*. Commonly associated shrubs include *Lonicera hispidula*, *Rubus ursinus*, and *Toxicodendron diversilobum*, and commonly associated herbs include *Clinopodium douglasii*, *Osmorhiza berteroi*, and *Sanicula crassicaulis*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	5.0	0 – 15	27.5	20 – 35
Hardwood	68.3	65 – 75	19.2	10 – 35
Regenerating or Shrubby Tree	3.3	0.8 – 7.8	2.8	1 – 5
Shrub	11.0	0.0 – 26.0	0.8	0.5 – 1
Herb	4.4	0.2 – 10	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 684 m, Range 654 – 717 m

Aspect: NE (1), SE (1), SW (1)

Slope: Mean 19 degrees, Range 15 – 22 degrees

Macro Topography: Upper 1/3 of slope (2), Middle 1/3 of slope (1)

Large Rock: Mean 0.3%, Range 0.0 – 0.6%

Small Rock: Mean 0.2%, Range 0.0 – 0.4%

Fines Cover: Mean 8.7%, Range 3.0 – 20.0%

Litter Cover: Mean 88.7%, Range 79.0 – 95%

Soil Texture (field assessed): Moderately fine silty clay loam (2), Medium to very fine, loamy sand (1)

Geology (field or map data): Sandstone (3)

San Mateo County Watersheds: Palo Alto (1), Pescadero Creek (1), San Gregorio Creek (1)

Site Impacts

This association has very low non-native plant cover (average 0.2%) relative to native cover. Non-native species that occur with highest frequency and abundance include

Quercus chrysolepis – *Umbellularia californica* Association
Quercus chrysolepis (tree) Woodland Alliance

Torilis arvensis and *Vicia sativa*.

Classification Comments

None.

References: Evens and Kentner 2006, Keeler-Wolf et al. 2003b, Klein et al. 2007, NPS-SEKI 2009

Global Rarity Rank: G4?

State Rarity Rank: SNR

State Rare: N

Surveys Used for Description

Total: N=3; San Mateo County (n=3): SMAT0001, SMAT0257, SMAT0286

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus chrysolepis</i>	100.0	83.4	59.3	45	73		Y		Y
	<i>Umbellularia californica</i>	100.0	8.0	5.7	2	10				Y
	<i>Quercus agrifolia</i>	100.0	1.6	1.1	0.2	3				Y
	<i>Pseudotsuga menziesii</i>	33.3	6.8	5.0	15	15				
	<i>Quercus lobata</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Acer macrophyllum</i>	33.3	0.1	0.1	0.2	0.2				
Regenerating or Shrubby Trees	<i>Quercus chrysolepis</i>	100.0	27.3	0.9	0.2	2.2	Y			Y
	<i>Umbellularia californica</i>	100.0	23.0	0.6	0.2	1.2	Y			Y
	<i>Pseudotsuga menziesii</i>	66.7	14.2	0.8	0.2	2.2	Y			Y
	<i>Arbutus menziesii</i>	66.7	12.6	0.4	0.2	1	Y			Y
	<i>Notholithocarpus densiflorus</i>	66.7	12.6	0.4	0.2	1				Y
	<i>Quercus agrifolia</i>	66.7	10.4	0.2	0.2	0.4				Y
Shrub	<i>Rubus ursinus</i>	66.7	29.1	7.0	1	20				Y
	<i>Toxicodendron diversilobum</i>	66.7	25.6	2.3	2	5				Y
	<i>Symphoricarpos albus</i>	66.7	3.4	0.7	0.2	2				Y
<p><i>Quercus chrysolepis</i> – <i>Umbellularia californica</i> Association <i>Quercus chrysolepis</i> (tree) Woodland Alliance</p>										

	<i>Lonicera hispidula</i>	66.7	3.4	0.7	0.2	2	Y
	<i>Corylus cornuta</i>	66.7	1.2	0.1	0.2	0.2	Y
	<i>Rosa gymnocarpa</i>	66.7	1.2	0.1	0.2	0.2	Y
	<i>Heteromeles arbutifolia</i>	33.3	0.9	0.1	0.2	0.2	
	<i>Ribes sanguineum</i>	33.3	0.9	0.1	0.2	0.2	
	<i>Sambucus nigra</i>	33.3	0.2	0.1	0.2	0.2	
	<i>Holodiscus discolor</i>	33.3	0.2	0.1	0.2	0.2	
	<i>Rubus parviflorus</i>	33.3	0.2	0.1	0.2	0.2	
	<i>Salix lasiolepis</i>	33.3	0.2	0.1	0.2	0.2	
Herb							
	<i>Clinopodium douglasii</i>	66.7	20.7	0.4	0.2	1	Y
	<i>Sanicula crassicaulis</i>	66.7	9.3	0.1	0.2	0.2	Y
	<i>Osmorhiza berteroi</i>	66.7	9.3	0.1	0.2	0.2	Y
	<i>Claytonia perfoliata</i>	33.3	5.6	0.1	0.2	0.2	
	<i>Fritillaria affinis</i>	33.3	5.6	0.1	0.2	0.2	
	<i>Iris fernaldii</i>	33.3	5.6	0.1	0.2	0.2	
	<i>Stachys ajugoides</i>	33.3	3.7	0.1	0.2	0.2	
	<i>Cynosurus echinatus</i>	33.3	3.7	0.1	0.2	0.2	
	<i>Elymus glaucus</i>	33.3	3.7	0.1	0.2	0.2	
	<i>Torilis arvensis</i>	33.3	3.7	0.1	0.2	0.2	
	<i>Madia madioides</i>	33.3	3.7	0.1	0.2	0.2	
	<i>Lathyrus vestitus</i>	33.3	3.7	0.1	0.2	0.2	
	<i>Iris macrosiphon</i>	33.3	3.7	0.1	0.2	0.2	
	<i>Fragaria vesca</i>	33.3	3.0	0.1	0.2	0.2	
	<i>Iris spp.</i>	33.3	3.0	0.1	0.2	0.2	
	<i>Marah fabaceus</i>	33.3	3.0	0.1	0.2	0.2	
	<i>Vicia sativa</i>	33.3	3.0	0.1	0.2	0.2	
	<i>Dryopteris arguta</i>	33.3	3.0	0.1	0.2	0.2	
	<i>Artemisia douglasiana</i>	33.3	3.0	0.1	0.2	0.2	
Non-Vascular							
	Moss	66.7	47.0	0.7	0.2	2	Y
	Lichen	66.7	19.7	0.1	0.2	0.2	Y

***Quercus chrysolepis* / *Quercus (wislizeni, parvula)* Association**

Common Name: Canyon Live Oak / Shrub Interior Live Oak Woodland

Alliance: *Quercus chrysolepis* (tree) Forest & Woodland Alliance

Local Vegetation Description

The Canyon Live Oak / Shrub Interior Live Oak Association forms an intermittent tree canopy with an open shrub understory. The dominant tree is *Quercus chrysolepis*, and those that are characteristic or often present include *Pseudotsuga menziesii*, *Umbellularia californica*, *Quercus parvula*, and *Quercus wislizeni*. The same species are often present in the regenerating or shrubby tree layer. Commonly associated shrubs include *Corylus cornuta*, *Rubus ursinus*, and *Symphoricarpos mollis*, and commonly associated herbs include *Carduus pycnocephalus*, *Fragaria vesca*, *Polystichum munitum*, and *Stachys ajugoides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	7.5	0 – 15	27.5	20 – 35
Hardwood	51.0	47 – 55	12.5	5 – 20
Regenerating or Shrubby Tree	5.0	3 – 7	3.5	2 – 5
Shrub	3.5	2 – 5	0.8	0.5 – 1
Herb	4.5	4 – 5	0.5	0 – 1

Local Environmental Description

Elevation: Mean 621 m, Range 487 – 755 m

Aspect: NE (1), SW (1)

Slope: Mean 28 degrees, Range 18 – 37 degrees

Macro Topography: Upper 1/3 of slope (2)

Large Rock: Mean 2.0%, Range 0.0 – 4%

Small Rock: Mean 0.6%, Range 0.2 – 1%

Fines Cover: Mean 7.6%, Range 0.2 – 15%

Litter Cover: Mean 87.5%, Range 78 – 97%

Soil Texture (field assessed): Moderately fine sandy clay loam (1), Moderately fine silty clay loam (1)

Geology (field or map data): Franciscan mélange (1), Sandstone (1)

San Mateo County Watersheds: Pescadero Creek (1)

Other Watersheds, Marin Co.: Lagunitas Creek (1)

Site Impacts

This association has low non-native plant cover (average 1.3%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Carduus pycnocephalus*.

Classification Comments

Due to hybridization and morphological similarity between the species, plants identified as *Quercus wislizeni* may be *Quercus parvula*, which has been found to be the most widespread genotype in Marin County (Dodd and Afzul-Rafii 2004, Hauser et al. 2017). The name of the association has been updated to reflect the prevalence of *Q. parvula*. Since the number of surveys of this association in San Mateo County is low, data from nearby counties were included.

References: Klein et al. 2007, Klein et al. 2015, Reyes et al. 2020a, VegCAMP 2015a

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** N

Surveys Used for Description

Total: N=2; San Mateo County (n=1): SMAT0260

Marin County (n=1): MMWD0356

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus chrysolepis</i>	100.0	49.3	27.5	25	30			Y	Y
	<i>Umbellularia californica</i>	100.0	5.0	3.0	2	4				Y
	<i>Quercus parvula</i> var. <i>shrevei</i>	50.0	18.1	12.5	25	25				Y
	<i>Quercus wislizeni</i>	50.0	15.6	7.5	15	15				
	<i>Pseudotsuga menziesii</i>	50.0	10.8	7.5	15	15				
	<i>Arbutus menziesii</i>	50.0	1.0	0.5	1	1				
	<i>Aesculus californica</i>	50.0	0.1	0.1	0.2	0.2				
Regenerating or Shrubby Trees	<i>Pseudotsuga menziesii</i>	100.0	56.2	2.6	2	3.2		Y		Y
	<i>Notholithocarpus densiflorus</i>	50.0	16.7	0.5	1	1				Y
	<i>Quercus parvula</i> var. <i>shrevei</i>	50.0	8.6	0.6	1.2	1.2				Y
	<i>Umbellularia californica</i>	50.0	8.6	0.6	1.2	1.2				Y
	<i>Quercus chrysolepis</i>	50.0	8.6	0.6	1.2	1.2				Y
	<i>Quercus agrifolia</i>	50.0	1.4	0.1	0.2	0.2				Y

Shrub

Quercus chrysolepis / *Quercus (wislizeni, parvula)* Association
Quercus chrysolepis (tree) Woodland Alliance

	<i>Rubus ursinus</i>	100.0	39.1	1.0	1	1	Y
	<i>Symphoricarpos mollis</i>	100.0	16.9	0.6	0.2	1	Y
	<i>Corylus cornuta</i>	50.0	22.7	1.0	2	2	Y
	<i>Lonicera hispidula</i>	50.0	5.6	0.1	0.2	0.2	Y
	<i>Toxicodendron diversilobum</i>	50.0	5.6	0.1	0.2	0.2	Y
	<i>Rosa gymnocarpa</i>	50.0	5.6	0.1	0.2	0.2	Y
	<i>Vaccinium ovatum</i>	50.0	2.3	0.1	0.2	0.2	Y
	<i>Holodiscus discolor</i>	50.0	2.3	0.1	0.2	0.2	Y
Herb							
	<i>Stachys ajugoides</i>	100.0	14.8	0.6	0.2	1	Y
	<i>Fragaria vesca</i>	100.0	5.3	0.2	0.2	0.2	Y
	<i>Carduus pycnocephalus</i>	50.0	11.9	0.5	1	1	Y
	<i>Polystichum munitum</i>	50.0	11.9	0.5	1	1	Y
	<i>Pentagramma triangularis</i>	50.0	2.9	0.1	0.2	0.2	Y
	<i>Bromus vulgaris</i>	50.0	2.9	0.1	0.2	0.2	Y
	<i>Osmorhiza berteroi</i>	50.0	2.9	0.1	0.2	0.2	Y
	<i>Sanicula crassicaulis</i>	50.0	2.9	0.1	0.2	0.2	Y
	<i>Madia madioides</i>	50.0	2.9	0.1	0.2	0.2	Y
	<i>Cynoglossum grande</i>	50.0	2.9	0.1	0.2	0.2	Y
	<i>Collinsia heterophylla</i>	50.0	2.9	0.1	0.2	0.2	Y
	<i>Dryopteris arguta</i>	50.0	2.9	0.1	0.2	0.2	Y
	<i>Lathyrus vestitus</i>	50.0	2.9	0.1	0.2	0.2	Y
	<i>Galium aparine</i>	50.0	2.9	0.1	0.2	0.2	Y
	<i>Iris spp.</i>	50.0	2.9	0.1	0.2	0.2	Y
	<i>Stellaria media</i>	50.0	2.9	0.1	0.2	0.2	Y
	<i>Torilis arvensis</i>	50.0	2.9	0.1	0.2	0.2	Y
	<i>Triteleia laxa</i>	50.0	2.9	0.1	0.2	0.2	Y
	<i>Claytonia perfoliata</i>	50.0	2.9	0.1	0.2	0.2	Y
	<i>Cynosurus echinatus</i>	50.0	2.4	0.1	0.2	0.2	Y
	<i>Pteridium aquilinum</i>	50.0	2.4	0.1	0.2	0.2	Y
	<i>Claytonia exigua</i>	50.0	2.4	0.1	0.2	0.2	Y
	<i>Elymus californicus</i>	50.0	2.4	0.1	0.2	0.2	Y
	<i>Melica torreyana</i>	50.0	2.4	0.1	0.2	0.2	Y
Non-Vascular							
	Moss	50.0	25.0	0.1	0.2	0.2	Y
	Lichen	50.0	25.0	0.1	0.2	0.2	Y

***Quercus chrysolepis* Association**

Common Name: Canyon Live Oak Woodland

Alliance: *Quercus chrysolepis* (tree) Forest & Woodland Alliance

Local Vegetation Description

The Canyon Live Oak Association forms an intermittent tree canopy with an open shrub understory in the single survey available. The dominant tree is *Quercus chrysolepis*, and *Pinus attenuata* are characteristic or often present. Regenerating or shrubby trees that are dominant and characteristic include *Pseudotsuga menziesii* and *Quercus chrysolepis*. Commonly associated shrubs include *Arctostaphylos crustacea*.

Lifeform	Cover (%)		Height (m)	
	Mean	Range	Mean	Range
Conifer	0.2	NA	7.5	5 – 10
Hardwood	35.0	NA	7.5	5 – 10
Regenerating or Shrubby Tree	3.2	NA	1.5	1 – 2
Shrub	3.0	NA	1.5	1 – 2
Herb	0.0	NA	no data	

Local Environmental Description

Elevation: 394 m

Aspect: SW (1)

Slope: 35 degrees

Macro Topography: Upper 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 25.0%

Fines Cover: 23.0%

Litter Cover: 50%

Soil Texture (field assessed): Moderately fine sandy clay loam (1)

Geology (field or map data): Siltstone (1)

San Mateo County Watersheds: none

Other Watersheds, Santa Cruz Co.: Ano Nuevo (1)

Site Impacts

This association has very low non-native plant cover (average 0.0%) relative to native cover. No non-native species were recorded by the surveyors.

Classification Comments

While there were no surveys from San Mateo County, the single survey was near the county line.

Quercus chrysolepis Association
Quercus chrysolepis (tree) Woodland Alliance

References: AECOM 2013, Buck-Diaz et al. 2012, Reyes et al. 2020a

Global Rarity Rank: GNR State Rarity Rank: SNR State Rare: N

Surveys Used for Description

Total: N=1; San Mateo County (n=0):

Santa Cruz County (n=1): SMAT0304

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus chrysolepis</i>	100.0	49.3	27.5	25	30			Y	Y
	<i>Umbellularia californica</i>	100.0	5.0	3.0	2	4				Y
	<i>Quercus parvula</i> var. <i>shrevei</i>	50.0	18.1	12.5	25	25				Y
	<i>Quercus wislizeni</i>	50.0	15.6	7.5	15	15				
	<i>Pseudotsuga menziesii</i>	50.0	10.8	7.5	15	15				
	<i>Arbutus menziesii</i>	50.0	1.0	0.5	1	1				
	<i>Aesculus californica</i>	50.0	0.1	0.1	0.2	0.2				
Regenerating or Shrubby Trees	<i>Pseudotsuga menziesii</i>	100.0	56.2	2.6	2	3.2		Y		Y
	<i>Notholithocarpus densiflorus</i>	50.0	16.7	0.5	1	1				Y
	<i>Quercus parvula</i> var. <i>shrevei</i>	50.0	8.6	0.6	1.2	1.2				Y
	<i>Umbellularia californica</i>	50.0	8.6	0.6	1.2	1.2				Y
	<i>Quercus chrysolepis</i>	50.0	8.6	0.6	1.2	1.2				Y
	<i>Quercus agrifolia</i>	50.0	1.4	0.1	0.2	0.2				Y
Shrub	<i>Rubus ursinus</i>	100.0	39.1	1.0	1	1				Y
	<i>Symphoricarpos mollis</i>	100.0	16.9	0.6	0.2	1				Y
	<i>Corylus cornuta</i>	50.0	22.7	1.0	2	2				Y
	<i>Lonicera hispidula</i>	50.0	5.6	0.1	0.2	0.2				Y
	<i>Toxicodendron diversilobum</i>	50.0	5.6	0.1	0.2	0.2				Y
	<i>Rosa gymnocarpa</i>	50.0	5.6	0.1	0.2	0.2				Y
	<i>Vaccinium ovatum</i>	50.0	2.3	0.1	0.2	0.2				Y
	<i>Holodiscus discolor</i>	50.0	2.3	0.1	0.2	0.2				Y

Quercus chrysolepis Association
Quercus chrysolepis (tree) Woodland Alliance

Herb

<i>Stachys ajugoides</i>	100.0	14.8	0.6	0.2	1	Y
<i>Fragaria vesca</i>	100.0	5.3	0.2	0.2	0.2	Y
<i>Carduus pycnocephalus</i>	50.0	11.9	0.5	1	1	Y
<i>Polystichum munitum</i>	50.0	11.9	0.5	1	1	Y
<i>Pentagramma triangularis</i>	50.0	2.9	0.1	0.2	0.2	Y
<i>Bromus vulgaris</i>	50.0	2.9	0.1	0.2	0.2	Y
<i>Osmorhiza berteroi</i>	50.0	2.9	0.1	0.2	0.2	Y
<i>Sanicula crassicaulis</i>	50.0	2.9	0.1	0.2	0.2	Y
<i>Madia madioides</i>	50.0	2.9	0.1	0.2	0.2	Y
<i>Cynoglossum grande</i>	50.0	2.9	0.1	0.2	0.2	Y
<i>Collinsia heterophylla</i>	50.0	2.9	0.1	0.2	0.2	Y
<i>Dryopteris arguta</i>	50.0	2.9	0.1	0.2	0.2	Y
<i>Lathyrus vestitus</i>	50.0	2.9	0.1	0.2	0.2	Y
<i>Galium aparine</i>	50.0	2.9	0.1	0.2	0.2	Y
<i>Iris spp.</i>	50.0	2.9	0.1	0.2	0.2	Y
<i>Stellaria media</i>	50.0	2.9	0.1	0.2	0.2	Y
<i>Torilis arvensis</i>	50.0	2.9	0.1	0.2	0.2	Y
<i>Triteleia laxa</i>	50.0	2.9	0.1	0.2	0.2	Y
<i>Claytonia perfoliata</i>	50.0	2.9	0.1	0.2	0.2	Y
<i>Cynosurus echinatus</i>	50.0	2.4	0.1	0.2	0.2	Y
<i>Pteridium aquilinum</i>	50.0	2.4	0.1	0.2	0.2	Y
<i>Claytonia exigua</i>	50.0	2.4	0.1	0.2	0.2	Y
<i>Elymus californicus</i>	50.0	2.4	0.1	0.2	0.2	Y
<i>Melica torreyana</i>	50.0	2.4	0.1	0.2	0.2	Y

Non-Vascular

Moss	50.0	25.0	0.1	0.2	0.2	Y
Lichen	50.0	25.0	0.1	0.2	0.2	Y

***Quercus douglasii* Forest & Woodland Alliance**



Common Name: Blue oak woodland and forest

NVC Alliance Code: A3348. *Quercus douglasii* - *Pinus sabiniana* Woodland Alliance

Statewide Description

Quercus douglasii is dominant or co-dominant in the tree canopy with *Aesculus californica*, *Juniperus californica*, *Pinus sabiniana*, *Quercus agrifolia*, *Quercus lobata*, and *Quercus wislizeni*.

The *Quercus douglasii* Alliance, in its varied forms, is one of the most extensive and conspicuous oak woodland vegetation types in the state. In some cases, oak savannas of *Quercus douglasii* trees are scattered across the landscape, and in other cases, trees of mixed composition form a closed tree canopy. Genetic variation is high in the species. Environmental factors controlling this variation include moisture availability, substrate, fire, and other disturbances (Allen-Diaz and Bartolome 1992, Allen-Diaz et al. 2007, Keeley 2002c). Named *Quercus douglasii* hybrids include those with *Q. john-tuckeri* (*Quercus* × *alvordiana*), *Q. garryana* (*Quercus* × *eplingii*), and *Q. lobata* (*Quercus* × *jolonensis*) (Griffin and Critchfield 1972).

Local Vegetation Description

The Blue oak woodland and forest Alliance forms an open to intermittent tree canopy with an open shrub understory. The dominant tree is *Quercus douglasii*, and *Quercus agrifolia*, *Aesculus californica*, and *Arbutus menziesii* are characteristic or often present.

Quercus douglasii Woodland Alliance

Regenerating or shrubby trees that are often present include *Arbutus menziesii* and *Quercus agrifolia*. Commonly associated shrubs include *Heteromeles arbutifolia*, *Lonicera hispidula*, *Toxicodendron diversilobum*, *Artemisia californica*, *Rhamnus crocea*, and *Symphoricarpos mollis*, and commonly associated herbs include *Achillea millefolium*, *Chlorogalum pomeridianum*, *Bromus carinatus*, *Bromus diandrus*, *Elymus glaucus*, *Geranium dissectum*, *Lolium perenne*, and *Pedicularis densiflora*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.3	0 – 1	1.5	1 – 2
Hardwood	33.8	24 – 41	8.8	5 – 15
Regenerating or Shrubby Tree	0.7	0 – 1.8	2.3	0.5 – 5
Shrub	15.5	11.0 – 20.0	1.6	0.5 – 5
Herb	23.5	15 – 34	0.5	0 – 1

Local Membership Rule

Quercus douglasii dominates or co-dominates with *Quercus agrifolia* or *Arbutus menziesii* in the tree overstory. The understory herbaceous layer is often moderately dense to dense, with a mixture of native and non-native forbs and grasses.

Local Environmental Description

Elevation: Mean 144 m, Range 113 – 164 m

Aspect: NE (2), SE (1), Variable (1)

Slope: Mean 13 degrees, Range 10 – 22 degrees

Macro Topography: Upper 1/3 of slope (2), Middle to Upper 1/3 of slope (1), Middle 1/3 of slope (1)

Large Rock: Mean 0.3%, Range 0.0 – 1.0%

Small Rock: Mean 0.1%, Range 0.0 – 0.4%

Fines Cover: Mean 16.0%, Range 2.0 – 37.0%

Litter Cover: Mean 80.5%, Range 60.0 – 95%

Soil Texture (field assessed): Fine sandy clay (1), Moderately fine clay loam (1), Coarse, loamy sand (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Sedimentary (type unknown) (2), Franciscan melange (1), Sandstone (1)

San Mateo County Watersheds: Palo Alto (2), San Mateo Bayside (1)

Other Watersheds, Santa Clara Co.: Palo Alto (1)

Site Impacts

This alliance has moderate non-native plant cover (average 28.5%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Brachypodium distachyon*, *Briza maxima*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Centaurea melitensis*, *Centaurea solstitialis*, *Crataegus monogyna*, *Genista monspessulana*, *Geranium dissectum*, *Hordeum murinum*, *Olea europaea*, *Torilis arvensis*, *Trifolium hirtum*, and *Vicia sativa*.

Associations in San Mateo County

- *Quercus douglasii* – *Quercus agrifolia*
- *Quercus douglasii* / Mixed herbaceous

Classification Comments

Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: Allen et al. 1989, Allen et al. 1991, Buck and Evens 2010, Buck-Diaz and Evens 2011b, Buck-Diaz et al. 2011, Buck-Diaz et al. 2012, Buck-Diaz et al. 2013, Evens et al. 2006, Kittel et al. 2012, Klein et al. 2007, Klein et al. 2015, O'Neil and Egan 2004, VegCAMP 2015a

Global Rarity Rank: G4

State Rarity Rank: S4

Surveys Used for Description

Total: N=4; San Mateo County (n=3): SCLAR121, SMAT0033, SMAT0254

Santa Clara County (n=1): SCLAR112

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus douglasii</i>	100.0	88.2	30.3	23	40	Y	Y		Y
	<i>Quercus agrifolia</i>	100.0	8.7	3.0	1	7	Y			Y
	<i>Arbutus menziesii</i>	50.0	1.0	0.3	0.2	1				Y
	<i>Aesculus californica</i>	50.0	0.3	0.1	0.2	0.2				Y
	<i>Pinus radiata</i>	25.0	0.7	0.3	1	1				
	<i>Quercus kelloggii</i>	25.0	0.9	0.3	1	1				
	<i>Olea europaea</i>	25.0	0.2	0.1	0.2	0.2				
Regenerating or Shrubby Trees	<i>Quercus agrifolia</i>	50.0	41.7	0.6	1	1.2				Y
	<i>Arbutus menziesii</i>	50.0	27.8	0.1	0.2	0.2				Y
	<i>Pinus radiata</i>	25.0	5.6	0.1	0.4	0.4				
Shrub	<i>Heteromeles arbutifolia</i>	100.0	23.0	2.6	0.2	7	Y			Y
	<i>Toxicodendron</i>	100.0	23.9	2.3	1	4	Y			Y

	<i>diversilobum</i>							
	<i>Lonicera hispidula</i>	75.0	1.2	0.2	0.2	0.2	Y	Y
	<i>Artemisia californica</i>	50.0	18.8	2.0	1	7		Y
	<i>Symphoricarpos mollis</i>	50.0	10.5	0.6	0.2	2		Y
	<i>Rhamnus crocea</i>	50.0	2.9	0.3	0.2	1		Y
	<i>Arctostaphylos crustacea</i>	25.0	12.8	2.0	8	8		
	<i>Diplacus aurantiacus</i>	25.0	1.6	0.3	1	1		
	<i>Adenostoma fasciculatum</i>	25.0	1.6	0.3	1	1		
	<i>Clematis lasiantha</i>	25.0	0.5	0.1	0.2	0.2		
	<i>Baccharis pilularis</i>	25.0	0.5	0.1	0.2	0.2		
	<i>Genista monspessulana</i>	25.0	0.4	0.1	0.2	0.2		
	<i>Cercocarpus betuloides</i>	25.0	0.4	0.1	0.2	0.2		
	<i>Ribes spp.</i>	25.0	0.3	0.1	0.2	0.2		
	<i>Cotoneaster spp.</i>	25.0	0.4	0.1	0.2	0.2		
	<i>Garrya elliptica</i>	25.0	0.5	0.1	0.2	0.2		
	<i>Eriophyllum confertiflorum</i>	25.0	0.3	0.1	0.2	0.2		
	<i>Crataegus monogyna</i>	25.0	0.4	0.1	0.2	0.2		
Herb								
	<i>Achillea millefolium</i>	75.0	1.6	0.4	0.2	1	Y	Y
	<i>Chlorogalum pomeridianum</i>	75.0	0.6	0.2	0.2	0.2	Y	Y
	<i>Bromus diandrus</i>	50.0	18.2	6.8	7	20		Y
	<i>Lolium perenne</i>	50.0	2.6	0.8	1	2		Y
	<i>Geranium dissectum</i>	50.0	1.0	0.6	0.2	2		Y
	<i>Pedicularis densiflora</i>	50.0	2.4	0.6	0.2	2		Y
	<i>Elymus glaucus</i>	50.0	1.0	0.3	0.2	1		Y
	<i>Bromus carinatus</i>	50.0	0.5	0.1	0.2	0.2		Y
	<i>Brachypodium distachyon</i>	25.0	14.0	5.0	20	20		
	<i>Hordeum murinum</i>	25.0	7.3	5.0	20	20		
	<i>Carduus pycnocephalus</i>	25.0	5.5	3.8	15	15		
	<i>Festuca californica</i>	25.0	17.2	3.8	15	15		
	<i>Briza maxima</i>	25.0	7.0	2.5	10	10		
	<i>Claytonia perfoliata</i>	25.0	1.8	1.3	5	5		
	<i>Avena spp.</i>	25.0	1.8	1.3	5	5		
	<i>Bromus hordeaceus</i>	25.0	6.2	1.0	4	4		
	<i>Nassella pulchra</i>	25.0	3.1	0.5	2	2		
	<i>Galium aparine</i>	25.0	0.4	0.3	1	1		
	<i>Centaurea solstitialis</i>	25.0	1.6	0.3	1	1		
	<i>Helianthella californica</i>	25.0	1.1	0.3	1	1		
	<i>Centaurea melitensis</i>	25.0	1.6	0.3	1	1		
	<i>Trifolium hirtum</i>	25.0	0.7	0.3	1	1		
	<i>Vicia sativa</i>	25.0	0.2	0.1	0.2	0.2		
	<i>Vulpia spp.</i>	25.0	0.2	0.1	0.2	0.2		

	<i>Triteleia laxa</i>	25.0	0.1	0.1	0.2	0.2	
	<i>Stachys bullata</i>	25.0	0.1	0.1	0.2	0.2	
	<i>Torilis arvensis</i>	25.0	0.3	0.1	0.2	0.2	
	<i>Wyethia glabra</i>	25.0	0.1	0.1	0.2	0.2	
	<i>Bromus laevipes</i>	25.0	0.1	0.1	0.2	0.2	
	<i>Sanicula crassicaulis</i>	25.0	0.2	0.1	0.2	0.2	
	<i>Perideridia kelloggii</i>	25.0	0.1	0.1	0.2	0.2	
	<i>Luzula comosa</i>	25.0	0.2	0.1	0.2	0.2	
	<i>Monardella villosa</i>	25.0	0.2	0.1	0.2	0.2	
	<i>Cynoglossum grande</i>	25.0	0.2	0.1	0.2	0.2	
	<i>Cordylanthus pilosus</i>	25.0	0.1	0.1	0.2	0.2	
	<i>Stachys albens</i>	25.0	0.2	0.1	0.2	0.2	
Non-Vascular							
	Moss	50.0	37.5	2.6	0.2	10	Y
	Lichen	25.0	12.5	0.1	0.2	0.2	

***Quercus douglasii* – *Quercus agrifolia* Association**

Common Name: Blue Oak – Coast Live Oak Woodland

Alliance: *Quercus douglasii* Forest & Woodland Alliance

Local Vegetation Description

The Blue Oak – Coast Live Oak Association forms an open to intermittent tree canopy with an open shrub understory. The dominant tree is *Quercus douglasii*, and *Quercus agrifolia* is characteristic and often present. Regenerating or shrubby trees that are often present include *Quercus agrifolia*. Commonly associated shrubs include *Heteromeles arbutifolia*, *Toxicodendron diversilobum*, *Artemisia californica*, *Lonicera hispidula*, and *Symphoricarpos mollis*, and commonly associated herbs include *Chlorogalum pomeridianum*, *Achillea millefolium*, *Bromus diandrus*, and *Geranium dissectum*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.5	0 – 1	1.5	1 – 2
Hardwood	31.3	24 – 40	7.5	5 – 10
Regenerating or Shrubby Tree	0.9	0 – 1.8	2.8	1 – 5
Shrub	10.0	5 – 15	1.0	0.5 – 2
Herb	31.7	15 – 55	0.4	0 – 1

Local Environmental Description

Elevation: Mean 139 m, Range 113 – 164 m

Aspect: NE (2), SE (1)

Slope: Mean 14 degrees, Range 10 – 22 degrees

Macro Topography: Middle 1/3 of slope (1), Middle to Upper 1/3 of slope (1), Upper 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 14.3%, Range 2.0 – 37.0%

Litter Cover: Mean 82.3%, Range 60.0 – 95%

Soil Texture (field assessed): Fine sandy clay (1), Moderately fine clay loam (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Sandstone (1), Sedimentary (type unknown) (1), Franciscan melange (1)

San Mateo County Watersheds: Palo Alto (1), San Mateo Bayside (1)

Other Watersheds, Santa Clara Co.: Palo Alto (1)

Site Impacts

This association has moderate non-native plant cover (average 25.4%) relative to native cover. Non- native species that occur with highest frequency and abundance include

Quercus douglasii – *Quercus agrifolia* Association
Quercus douglasii Woodland Alliance

Pinus radiata, *Bromus diandrus*, *Geranium dissectum*, *Achillea millefolium*, *Hordeum murinum*, and *Carduus pycnocephalus*.

Classification Comments

Formerly there was an analogous co-dominant association in the *Quercus agrifolia* Alliance (*Quercus agrifolia* – *Quercus douglasii*), which has been subsumed into this association. Since the number of surveys of this association in San Mateo County is low, data from nearby counties were included.

References: Allen et al. 1989, Allen et al. 1991, Klein et al. 2015, O’Neil and Egan 2004

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** N

Surveys Used for Description

Total: N=3; San Mateo County (n=2): SCLAR121, SMAT0033

Santa Clara County (n=1): SCLAR112

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus douglasii</i>	100.0	85.4	27.0	23	30		Y		Y
	<i>Quercus agrifolia</i>	100.0	10.8	3.7	2	7				Y
	<i>Quercus kelloggii</i>	33.3	1.2	0.3	1	1				
	<i>Arbutus menziesii</i>	33.3	1.2	0.3	1	1				
	<i>Pinus radiata</i>	33.3	0.9	0.3	1	1				
	<i>Olea europaea</i>	33.3	0.2	0.1	0.2	0.2				
	<i>Aesculus californica</i>	33.3	0.2	0.1	0.2	0.2				
Regenerating or Shrubby Trees	<i>Quercus agrifolia</i>	66.7	55.6	0.7	1	1.2				Y
	<i>Pinus radiata</i>	33.3	7.4	0.1	0.4	0.4				
	<i>Arbutus menziesii</i>	33.3	3.7	0.1	0.2	0.2				
Shrub	<i>Toxicodendron diversilobum</i>	100.0	20.9	1.7	1	2				Y
	<i>Heteromeles arbutifolia</i>	100.0	11.6	1.1	0.2	2				Y
	<i>Artemisia californica</i>	66.7	25.0	2.7	1	7				Y
	<i>Symphoricarpos mollis</i>	66.7	14.0	0.7	0.2	2				Y
	<i>Quercus douglasii</i> – <i>Quercus agrifolia</i> Association <i>Quercus douglasii</i> Woodland Alliance									

	<i>Lonicera hispidula</i>	66.7	1.1	0.1	0.2	0.2	Y
	<i>Arctostaphylos</i> <i>crustacea</i>	33.3	17.1	2.7	8	8	
	<i>Rhamnus crocea</i>	33.3	3.3	0.3	1	1	
	<i>Diplacus aurantiacus</i>	33.3	2.1	0.3	1	1	
	<i>Adenostoma</i> <i>fasciculatum</i>	33.3	2.1	0.3	1	1	
	<i>Baccharis pilularis</i>	33.3	0.7	0.1	0.2	0.2	
	<i>Clematis lasiantha</i>	33.3	0.7	0.1	0.2	0.2	
	<i>Garrya elliptica</i>	33.3	0.7	0.1	0.2	0.2	
	<i>Ribes spp.</i>	33.3	0.4	0.1	0.2	0.2	
	<i>Eriophyllum</i> <i>confertiflorum</i>	33.3	0.4	0.1	0.2	0.2	
Herb							
	<i>Chlorogalum</i> <i>pomeridianum</i>	100.0	0.8	0.2	0.2	0.2	Y
	<i>Bromus diandrus</i>	66.7	24.3	9.0	7	20	Y
	<i>Achillea millefolium</i>	66.7	1.9	0.4	0.2	1	Y
	<i>Geranium dissectum</i>	66.7	1.3	0.7	0.2	2	Y
	<i>Festuca californica</i>	33.3	22.9	5.0	15	15	
	<i>Hordeum murinum</i>	33.3	9.7	6.7	20	20	
	<i>Bromus hordeaceus</i>	33.3	8.3	1.3	4	4	
	<i>Carduus pycnocephalus</i>	33.3	7.3	5.0	15	15	
	<i>Nassella pulchra</i>	33.3	4.2	0.7	2	2	
	<i>Pedicularis densiflora</i>	33.3	3.1	0.7	2	2	
	<i>Avena spp.</i>	33.3	2.4	1.7	5	5	
	<i>Claytonia perfoliata</i>	33.3	2.4	1.7	5	5	
	<i>Centaurea solstitialis</i>	33.3	2.1	0.3	1	1	
	<i>Centaurea melitensis</i>	33.3	2.1	0.3	1	1	
	<i>Helianthella californica</i>	33.3	1.5	0.3	1	1	
	<i>Lolium perenne</i>	33.3	1.5	0.3	1	1	
	<i>Galium aparine</i>	33.3	0.5	0.3	1	1	
	<i>Bromus carinatus</i>	33.3	0.4	0.1	0.2	0.2	
	<i>Elymus glaucus</i>	33.3	0.4	0.1	0.2	0.2	
	<i>Torilis arvensis</i>	33.3	0.4	0.1	0.2	0.2	
	<i>Monardella villosa</i>	33.3	0.3	0.1	0.2	0.2	
	<i>Cynoglossum grande</i>	33.3	0.3	0.1	0.2	0.2	
	<i>Luzula comosa</i>	33.3	0.3	0.1	0.2	0.2	
	<i>Vicia sativa</i>	33.3	0.3	0.1	0.2	0.2	
	<i>Sanicula crassicaulis</i>	33.3	0.3	0.1	0.2	0.2	
	<i>Stachys albens</i>	33.3	0.3	0.1	0.2	0.2	
	<i>Vulpia spp.</i>	33.3	0.3	0.1	0.2	0.2	
	<i>Stachys bullata</i>	33.3	0.1	0.1	0.2	0.2	
Non-Vascular							
	Moss	33.3	33.3	3.3	10	10	

***Quercus douglasii* / Mixed herbaceous Association**

Common Name: Blue Oak / Mixed herb Woodland

Alliance: *Quercus douglasii* Forest & Woodland Alliance

Local Vegetation Description

The Blue Oak / Mixed herb Association forms an intermittent tree canopy with an open shrub understory in the single survey available. The dominant tree is *Quercus douglasii*, and *Aesculus californica*, *Arbutus menziesii*, and *Quercus agrifolia* are characteristic or often present. Regenerating or shrubby trees that are dominant and characteristic include *Arbutus menziesii*. Commonly associated shrubs include *Heteromeles arbutifolia*, *Toxicodendron diversilobum*, *Cercocarpus betuloides*, *Cotoneaster* spp., *Crataegus monogyna*, *Genista monspessulana*, *Lonicera hispidula*, and *Rhamnus crocea* and commonly associated herbs include *Brachypodium distachyon*, *Achillea millefolium*, *Briza maxima*, *Bromus carinatus*, *Bromus laevipes*, *Cordylanthus pilosus*, *Elymus glaucus*, *Lolium perenne* ssp. *multiflorum*, *Pedicularis densiflora*, *Perideridia kelloggii*, *Trifolium hirtum*, *Triteleia laxa*, and *Wyethia glabra*, .

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	NA	no data	no data
Hardwood	41.0	NA	12.5	10 – 15
Regenerating or Shrubby Tree	0.2	NA	0.8	0.5 – 1
Shrub	11.0	NA	3.5	2 – 5
Herb	34.0	NA	0.8	0.5 – 1

Local Environmental Description

Elevation: 161 m

Aspect: Variable (1)

Slope: 10 degrees

Macro Topography: Upper 1/3 of slope (1)

Large Rock: 1.0%

Small Rock: 0.4%

Fines Cover: 21.0%

Litter Cover: 75%

Soil Texture (field assessed): Coarse, loamy sand (1)

Geology (field or map data): Sedimentary (type unknown) (1)

San Mateo County Watersheds: Palo Alto (1)

Site Impacts

This association has moderate non-native plant cover (average 37.6%) relative to native

Quercus douglasii / Mixed herbaceous Association
Quercus douglasii Woodland Alliance

cover. Non- native species that occur with highest frequency and abundance include *Brachypodium distachyon*, *Briza maxima*, and *Lolium perenne*.

Classification Comments

The name of this association has been updated from *Quercus douglasii* / Grass to match an existing NVC association name.

References: Buck-Diaz et al. 2011, Buck-Diaz et al. 2012, Buck-Diaz et al. 2013, Buck and Evens 2011a, Evens et al. 2006, Kittel et al. 2012, Klein et al. 2007, Klein et al. 2015, O'Neil and Egan 2004, VegCAMP 2015a

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** N

Surveys Used for Description

Total: N=1; **San Mateo County (n=1):** SMAT0254

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus douglasii</i>	100.0	96.6	40.0	40	40		Y		Y
	<i>Quercus agrifolia</i>	100.0	2.4	1.0	1	1				Y
	<i>Aesculus californica</i>	100.0	0.5	0.2	0.2	0.2				Y
	<i>Arbutus menziesii</i>	100.0	0.5	0.2	0.2	0.2				Y
Regenerating or Shrubby Trees	<i>Arbutus menziesii</i>	100.0	100.0	0.2	0.2	0.2		Y		Y
Shrub	<i>Heteromeles arbutifolia</i>	100.0	57.4	7.0	7	7		Y		Y
	<i>Toxicodendron diversilobum</i>	100.0	32.8	4.0	4	4			Y	Y
	<i>Genista monspessulana</i>	100.0	1.6	0.2	0.2	0.2				Y
	<i>Lonicera hispidula</i>	100.0	1.6	0.2	0.2	0.2				Y
	<i>Rhamnus crocea</i>	100.0	1.6	0.2	0.2	0.2				Y
	<i>Cercocarpus betuloides</i>	100.0	1.6	0.2	0.2	0.2				Y
	<i>Crataegus monogyna</i>	100.0	1.6	0.2	0.2	0.2				Y
	<i>Cotoneaster spp.</i>	100.0	1.6	0.2	0.2	0.2				Y
Herb	<i>Brachypodium distachyon</i>	100.0	56.2	20.0	20	20				Y

Quercus douglasii / Mixed herbaceous Association
Quercus douglasii Woodland Alliance

	<i>Briza maxima</i>	100.0	28.1	10.0	10	10		Y
	<i>Lolium perenne</i>	100.0	5.6	2.0	2	2		Y
	<i>Elymus glaucus</i>	100.0	2.8	1.0	1	1		Y
	<i>Trifolium hirtum</i>	100.0	2.8	1.0	1	1		Y
	<i>Achillea millefolium</i>	100.0	0.6	0.2	0.2	0.2		Y
	<i>Bromus laevipes</i>	100.0	0.6	0.2	0.2	0.2		Y
	<i>Wyethia glabra</i>	100.0	0.6	0.2	0.2	0.2		Y
	<i>Triteleia laxa</i>	100.0	0.6	0.2	0.2	0.2		Y
	<i>Cordylanthus pilosus</i>	100.0	0.6	0.2	0.2	0.2		Y
	<i>Pedicularis densiflora</i>	100.0	0.6	0.2	0.2	0.2		Y
	<i>Bromus carinatus</i>	100.0	0.6	0.2	0.2	0.2		Y
	<i>Perideridia kelloggii</i>	100.0	0.6	0.2	0.2	0.2		Y
Non-Vascular								
	Lichen	100.0	50.0	0.2	0.2	0.2	Y	Y
	Moss	100.0	50.0	0.2	0.2	0.2	Y	Y

***Quercus kelloggii* Forest & Woodland Alliance**



Common Name: California black oak forest and woodland

NVC Alliance Code: A3349. *Quercus chrysolepis* - *Quercus kelloggii* Forest & Woodland Alliance

Statewide Description

Quercus kelloggii is dominant or co-dominant in the tree canopy with *Abies concolor*, *Arbutus menziesii*, *Calocedrus decurrens*, *Pinus attenuata*, *Pinus ponderosa*, *Pseudotsuga menziesii*, *Quercus agrifolia*, *Quercus chrysolepis*, *Quercus garryana*, *Quercus lobata*, and *Umbellularia californica*.

The range of *Quercus kelloggii* is sufficiently wide that it mixes with many species in many alliances (Gaman and Casey 2002), though it tends to occur in higher elevations than most tree oaks other than *Q. chrysolepis*. The *Quercus kelloggii* Alliance occurs from the foothills to mid-montane elevations, from the Coast Ranges to the Klamath Mountains and the western Sierra Nevada (Barbour et al. 2007a). Conifers replace *Quercus kelloggii* on productive sites in the absence of fire. Conifer replacement is slower or lacking on unproductive sites (Howard 1992I). Stands commonly have *Pinus ponderosa*, *Pinus sabiniana*, and less commonly *Pinus jeffreyi*.

Local Vegetation Description

The California black oak forest and woodland Alliance forms an open to continuous tree canopy with a sparse to intermittent shrub understory. The dominant tree is *Quercus*

Quercus kelloggii Woodland Alliance

kelloggii, and *Arbutus menziesii*, *Quercus agrifolia*, and *Umbellularia californica* are characteristic or often present. Commonly associated shrubs include *Toxicodendron diversilobum*, and commonly associated herbs include *Avena* spp., *Briza maxima*, *Carduus pycnocephalus*, and *Vicia sativa*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.6	0 – 2	15.0	10 – 20
Hardwood	49.3	20 – 75	11.7	5 – 20
Regenerating or Shrubby Tree	2.4	0 – 23.6	3.5	2 – 5
Shrub	8.0	0.0 – 40.0	3.3	0.5 – 10
Herb	43.3	10 – 95	0.4	0 – 1

Local Membership Rule

Quercus kelloggii or *Quercus × morehus* dominates or co-dominates with *Pseudotsuga menziesii*, *Q. agrifolia*, and/or *Umbellularia californica* in the tree overstory. *Arbutus menziesii* is often present as a sub-dominant species. Stands in San Mateo County are found inland, above maritime influence, often on northerly slopes.

Local Environmental Description

Elevation: Mean 202 m, Range 50 – 622 m

Aspect: NW (6), NE (1), SW (1), Variable (1)

Slope: Mean 21 degrees, Range 12 – 32 degrees

Macro Topography: Middle 1/3 of slope (4), Upper 1/3 of slope (4), Not recorded (1)

Large Rock: Mean 0.1%, Range 0.0 – 0.2%

Small Rock: Mean 0.3%, Range 0.0 – 1.2%

Fines Cover: Mean 10.3%, Range 0.0 – 68.0%

Litter Cover: Mean 58.2%, Range 0.0 – 94%

Soil Texture (field assessed): Moderately coarse, sandy loam (4), Medium to very fine, sandy loam (2), Moderately fine clay loam (2), Moderately fine sandy clay loam (1)

Geology (field or map data): Franciscan melange (6), Blueschist and semi-schist (2), Mixed sedimentary (1), Sandstone and other sedimentary (1)

San Mateo County Watersheds: Palo Alto (1)

Other Watersheds, Marin Co.: Lagunitas Creek (3), Petaluma River (3), San Rafael (2), Novato (1)

Site Impacts

This alliance has moderate non-native plant cover (average 26.6%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Briza maxima*, *Bromus diandrus*, *Carduus pycnocephalus*, *Cynosurus echinatus*, *Torilis arvensis*, *Torilis nodosa*, and *Vicia sativa*.

Associations in San Mateo County

- *Quercus kelloggii* – *Arbutus menziesii* – *Quercus agrifolia*

Classification Comments

None.

References: Allen et al. 1991, Evens and Kentner 2006, Klein et al. 2007, Klein et al. 2015

Global Rarity Rank: G4 **State Rarity Rank:** S4

Surveys Used for Description

Total: N=10; San Mateo County (n=1): SMAT0094

Marin County (n=9): HYPM067, MARIN029, MMWD0055, MMWD0189A, MMWD0223, MMWD0411A, MMWD0412, MOSD0160, MOSD0317

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus kelloggii</i>	100.0	51.0	22.2	8	40	Y	Y		Y
	<i>Quercus agrifolia</i>	100.0	15.8	7.5	2	25	Y			Y
	<i>Arbutus menziesii</i>	90.0	15.2	5.2	2	12	Y			Y
	<i>Umbellularia californica</i>	80.0	13.9	7.5	0.75	30	Y			Y
	<i>Quercus lobata</i>	20.0	1.0	0.6	3	3				
Regenerating or Shrubby Trees	<i>Umbellularia californica</i>	30.0	19.3	1.1	0.2	10.2				
	<i>Pseudotsuga menziesii</i>	20.0	5.4	0.1	0.2	1				
Shrub	<i>Toxicodendron diversilobum</i>	90.0	42.4	2.8	0.2	20	Y		Y	Y
	<i>Lonicera hispidula</i>	40.0	4.3	0.1	0.2	0.2				
	<i>Symphoricarpos mollis</i>	30.0	6.8	0.8	0.2	5				
	<i>Diplacus aurantiacus</i>	30.0	0.9	0.2	0.2	2				
	<i>Frangula californica</i>	20.0	0.4	0.0	0.2	0.2				
Herb	<i>Briza maxima</i>	50.0	16.3	7.6	1	40				Y
	<i>Avena spp.</i>	50.0	10.2	4.1	0.2	22				Y
	<i>Vicia sativa</i>	50.0	2.4	0.6	0.2	2				Y
	<i>Carduus pycnocephalus</i>	50.0	1.7	0.4	0.2	1				Y

<i>Cynosurus echinatus</i>	40.0	9.0	5.5	0.2	30
<i>Melica torreyana</i>	40.0	4.2	1.2	0.2	10
<i>Stachys ajugoides</i>	30.0	1.9	0.6	0.2	5
<i>Elymus glaucus</i>	30.0	0.6	0.3	0.2	2
<i>Cynoglossum grande</i>	30.0	0.7	0.2	0.2	2
<i>Sanicula crassicaulis</i>	30.0	0.8	0.1	0.2	1
<i>Torilis nodosa</i>	30.0	1.0	0.1	0.2	1
<i>Iris douglasiana</i>	20.0	6.9	0.8	2	6
<i>Bromus diandrus</i>	20.0	2.7	0.7	2	5
<i>Galium triflorum</i>	20.0	1.5	0.6	1	5
<i>Torilis arvensis</i>	20.0	0.7	0.3	1	2
<i>Clinopodium douglasii</i>	20.0	0.7	0.1	0.2	1
<i>Pteridium aquilinum</i>	20.0	0.1	0.0	0.2	0.2
<i>Galium porrigens</i>	20.0	0.6	0.0	0.2	0.2
<i>Chlorogalum pomeridianum</i>	20.0	0.6	0.0	0.2	0.2

Quercus kelloggii – Arbutus menziesii – Quercus agrifolia Association

Common Name: California Black Oak – Madrone – Coast Live Oak Woodland

Alliance: *Quercus kelloggii* Forest & Woodland Alliance

Local Vegetation Description

The California Black Oak – Madrone – Coast Live Oak Association forms an intermittent tree canopy with an open shrub understory in the single survey available. The dominant tree is *Quercus kelloggii*, and *Arbutus menziesii*, *Quercus agrifolia*, and *Umbellularia californica* are characteristic or often present.

Commonly associated shrubs include *Toxicodendron diversilobum*, and commonly associated herbs include *Avena* spp., *Briza maxima*, *Carduus pycnocephalus*, and *Vicia sativa*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	2.0	NA	17.5	15 – 20
Hardwood	55.0	NA	12.5	10 – 15
Regenerating or Shrubby Tree	23.6	NA	3.5	2 – 5
Shrub	13.0	NA	0.8	0.5 – 1
Herb	10.0	NA	0.3	0 – 0.5

Local Environmental Description

Elevation: 622 m

Aspect: NW (1)

Slope: 13 degrees

Macro Topography: Upper 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 1.3%

Fines Cover: 10.0%

Litter Cover: 85%

Soil Texture (field assessed): Medium to very fine, sandy loam (1)

Geology (field or map data): Mixed sedimentary (1)

San Mateo County Watersheds: Palo Alto (1)

Site Impacts

This association has low non-native plant cover (average 3.4%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Avena* spp., *Briza maxima*, *Carduus pycnocephalus*, *Cynosurus echinatus*, *Torilis nodosa*, and *Vicia sativa*.

Classification Comments

None.

References: Allen et al. 1991, Evens and Kentner 2006, Klein et al. 2015

Global Rarity Rank: G3 **State Rarity Rank:** S3 **State Rare:** Y

Surveys Used for Description

Total: N=1; **San Mateo County (n=1):** SMAT0094

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus kelloggii</i>	100.0	37.0	20.0	20	20			Y	Y
	<i>Umbellularia californica</i>	100.0	27.8	15.0	15	15				Y
	<i>Quercus agrifolia</i>	100.0	18.5	10.0	10	10				Y
	<i>Arbutus menziesii</i>	100.0	9.3	5.0	5	5				Y
	<i>Quercus lobata</i>	100.0	5.6	3.0	3	3				Y
	<i>Pseudotsuga menziesii</i>	100.0	1.9	1.0	1	1				Y
Regenerating or Shrubby Trees	<i>Umbellularia californica</i>	100.0	43.2	10.2	10.2	10.2			Y	Y
	<i>Quercus kelloggii</i>	100.0	22.0	5.2	5.2	5.2				Y
	<i>Quercus agrifolia</i>	100.0	22.0	5.2	5.2	5.2				Y
	<i>Quercus lobata</i>	100.0	4.2	1.0	1	1				Y
	<i>Arbutus menziesii</i>	100.0	4.2	1.0	1	1				Y
	<i>Pseudotsuga menziesii</i>	100.0	4.2	1.0	1	1				Y
Shrub	<i>Toxicodendron diversilobum</i>	100.0	74.6	20.0	20	20		Y		Y
	<i>Symphoricarpos mollis</i>	100.0	18.7	5.0	5	5				Y
	<i>Lonicera involucrata</i>	100.0	3.7	1.0	1	1				Y
	<i>Prunus spp.</i>	100.0	0.7	0.2	0.2	0.2				Y
	<i>Rubus ursinus</i>	100.0	0.7	0.2	0.2	0.2				Y
	<i>Sambucus nigra</i>	100.0	0.7	0.2	0.2	0.2				Y

Quercus kelloggii – *Arbutus menziesii* – *Quercus agrifolia* Association
Quercus kelloggii Woodland Alliance

Herb	<i>Frangula californica</i>	100.0	0.7	0.2	0.2	0.2		Y
	<i>unknown Poaceae</i>	100.0	35.2	5.0	5	5	Y	Y
	<i>Holcus lanatus</i>	100.0	14.1	2.0	2	2		Y
	<i>Vicia sativa</i>	100.0	14.1	2.0	2	2		Y
	<i>Vicia gigantea</i>	100.0	14.1	2.0	2	2		Y
	<i>Clinopodium douglasii</i>	100.0	7.0	1.0	1	1		Y
	<i>Dryopteris arguta</i>	100.0	7.0	1.0	1	1		Y
	<i>Sanicula crassicaulis</i>	100.0	7.0	1.0	1	1		Y
Non-Vascular	<i>Iris fernaldii</i>	100.0	1.4	0.2	0.2	0.2		Y
	Moss	100.0	100.0	0.2	0.2	0.2	Y	Y

***Quercus lobata* Forest & Woodland Alliance**



Common Name: Valley oak woodland and forest

NVC Alliance Code: A3347. *Quercus lobata* Woodland Alliance

Statewide Description

Quercus lobata is dominant or co-dominant in the tree canopy with *Acer negundo*, *Alnus rhombifolia*, *Fraxinus latifolia*, *Juglans hindsii*, *Juglans hindsii* × *regia*, *Platanus racemosa*, *Populus fremontii*, *Quercus agrifolia*, *Quercus douglasii*, *Quercus kelloggii*, *Quercus wislizeni*, *Salix gooddingii*, and *Salix lasiolepis*. Shrubs and lianas may include *Aristolochia californica* or *Vitis californica*.

Quercus lobata is endemic to California, and stands vary from open savannas to closed-canopy forests (Allen-Diaz et al. 2007). Riparian and upland forests of *Quercus lobata* occur in the deep, rich soil typical of floodplains and valley floors. This alliance includes the upland forests. These forests are only remnants of what once existed in the Central Valley, other valleys, and foothill locations (Allen-Diaz et al. 2007).

Local Vegetation Description

The Valley oak woodland and forest Alliance forms an open to intermittent tree canopy with a sparse to open shrub understory. The dominant tree is *Quercus lobata*, and *Quercus agrifolia* are characteristic or often present. Commonly associated shrubs include *Toxicodendron diversilobum* and *Baccharis pilularis*, and commonly associated herbs include *Avena* spp., *Bromus diandrus*, *Carduus pycnocephalus*, *Elymus glaucus*,

Quercus lobata Woodland Alliance

Achillea millefolium, *Geranium dissectum*, *Lolium perenne*, *Sanicula crassicaulis*, and *Vicia sativa*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0.2	7.5	5 – 10
Hardwood	28.0	11 – 35	10.0	5 – 15
Regenerating or Shrubby Tree	3.9	0 – 28.0	0.8	0 – 2
Shrub	1.7	0.0 – 5.0	1.0	0.5 – 2
Herb	49.2	30 – 65	0.3	0 – 1

Local Membership Rule

Quercus lobata dominates or co-dominates with *Quercus agrifolia* and/or *Umbellularia californica* in the tree overstory in an upland habitat. Stands are typically found on slopes and summit valleys with an open grassy understory and *Toxicodendron diversilobum* is a common understory shrub.

Local Environmental Description

Elevation: Mean 193 m, Range 23 – 653 m

Aspect: NE (3), NW (2), SE (1), Variable (1), Flat (1)

Slope: Mean 11 degrees, Range 0 – 30 degrees

Macro Topography: Middle 1/3 of slope (4), Middle to Upper 1/3 of slope (1), Lower 1/3 of slope (1), Lower to Middle 1/3 of slope (1)

Large Rock: Mean 0.6%, Range 0.0 – 2.4%

Small Rock: Mean 0.6%, Range 0.0 – 2.2%

Fines Cover: Mean 23.4%, Range 0.2 – 65.0%

Litter Cover: Mean 73.7%, Range 35.0 – 97%

Soil Texture (field assessed): Medium to very fine, sandy loam (2), Fine sandy clay (2), Fine clay (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Sandstone and other sedimentary (3), Franciscan melange (3), Mixed metamorphic (2)

San Mateo County Watersheds: San Mateo Bayside (2), Palo Alto (1)

Other Watersheds, Marin Co.: Novato (1), San Rafael (1); **Santa Clara Co.:** Palo Alto (2), Guadalupe River (1)

Site Impacts

This alliance has high non-native plant cover (average 48.5%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Briza maxima*, *Briza minor*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Centaurea solstitialis*, *Cynosurus echinatus*, *Geranium dissectum*, *Plantago lanceolata*, *Sherardia arvensis*, *Torilis nodosa*, *Trifolium dubium*, and *Vicia sativa*.

Associations in San Mateo County

- *Quercus lobata* / grass

Quercus lobata Woodland Alliance

Classification Comments

Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: Allen et al. 1989, Buck and Evens 2010, Buck-Diaz et al. 2012, Evens and Kentner 2006, Evens and San 2004, Evens et al. 2004, Keeler-Wolf and Evens 2006, Kittel et al. 2012, Klein et al. 2015, O'Neil and Egan 2004, Reyes et al. 2020

Global Rarity Rank: G3

State Rarity Rank: S3

Surveys Used for Description

Total: N=8; San Mateo County (n=3): SMAT0023, SMAT0062, SMAT0090

Marin County (n=2): MARIN026, MMWD0068

Santa Clara County (n=3): CORT142, CORT146, SCLAR117

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	100	60.2	45.0	40.0	50.0	Y	Y		Y
	<i>Quercus kelloggii</i>	100	18.1	14.0	8.0	20.0				Y
	<i>Umbellularia californica</i>	50	12.5	10.0	20.0	20.0				
Regenerating or Shrubby Trees	<i>Quercus lobata</i>	37.5	26.6	3.6	0.2	28				
	<i>Quercus agrifolia</i>	25.0	21.9	0.2	0.2	1.2				
Shrub	<i>Toxicodendron diversilobum</i>	75.0	47.9	1.2	0.2	5	Y		Y	Y
	<i>Baccharis pilularis</i>	50.0	22.8	0.2	0.2	1				Y
Herb	<i>Avena spp.</i>	87.5	18.6	10.5	0.2	45	Y			Y
	<i>Carduus pycnocephalus</i>	87.5	9.2	8.1	1	38	Y			Y
	<i>Elymus glaucus</i>	75.0	13.8	12.5	0.2	78	Y			Y
	<i>Bromus diandrus</i>	75.0	11.7	9.2	0.2	36	Y			Y
	<i>Lolium perenne</i>	62.5	5.7	4.8	0.2	20				Y
	<i>Geranium dissectum</i>	62.5	3.6	3.0	2	9				Y
	<i>Vicia sativa</i>	62.5	1.3	1.2	0.2	4				Y
	<i>Sanicula crassicaulis</i>	62.5	0.4	0.2	0.2	1				Y
	<i>Achillea millefolium</i>	50.0	0.5	0.8	0.2	4				Y
<i>Bromus hordeaceus</i>	37.5	3.4	1.7	0.2	10					

<i>Plantago lanceolata</i>	37.5	1.7	0.5	1	2
<i>Bromus carinatus</i>	37.5	0.3	0.4	0.2	3
<i>Nassella pulchra</i>	37.5	0.8	0.4	0.2	2
<i>Chlorogalum pomeridianum</i>	37.5	0.6	0.2	0.2	1
<i>Centaurea solstitialis</i>	25.0	3.8	6.3	3	47
<i>Briza maxima</i>	25.0	6.9	2.0	4	12
<i>Torilis nodosa</i>	25.0	2.2	1.8	7	7
<i>Briza minor</i>	25.0	0.6	1.0	0.2	8
<i>Trifolium dubium</i>	25.0	0.6	0.9	0.2	7
<i>Cynosurus echinatus</i>	25.0	2.3	0.9	2	5
<i>Sherardia arvensis</i>	25.0	0.2	0.4	0.2	3
<i>Galium aparine</i>	25.0	0.7	0.3	1	1
<i>Sisyrinchium bellum</i>	25.0	0.3	0.2	0.2	1
<i>Stachys ajugoides</i>	25.0	0.5	0.2	0.2	1
<i>Claytonia perfoliata</i>	25.0	0.5	0.2	0.2	1
<i>Agoseris grandiflora</i>	25.0	0.1	0.1	0.2	0.2
Non-Vascular					
Moss	25.0	18.8	0.1	0.2	0.2

***Quercus lobata* / grass Association**

Common Name: Valley Oak / Grass Woodland

Alliance: *Quercus lobata* Forest & Woodland Alliance

Local Vegetation Description

The Valley Oak / Grass Association forms an open to intermittent tree canopy with a sparse to open shrub understory. The dominant tree is *Quercus lobata*, and *Quercus agrifolia* is often present. Commonly associated shrubs include *Toxicodendron diversilobum* and *Baccharis pilularis*, and commonly associated herbs include *Avena* spp., *Bromus diandrus*, *Carduus pycnocephalus*, *Elymus glaucus*, *Achillea millefolium*, *Geranium dissectum*, *Lolium perenne* ssp. *multiflorum*, *Sanicula crassicaulis*, and *Vicia sativa*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.1	0 – 0.2	7.5	5 – 10
Hardwood	31.7	30 – 35	10.8	5 – 15
Regenerating or Shrubby Tree	0.5	0 – 1.6	1.1	0.5 – 2
Shrub	1.1	0.2 – 3.0	1.0	0.5 – 2
Herb	48.3	40 – 55	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 159 m, Range 101 – 231 m

Aspect: Flat (1), NW (1), SE (1)

Slope: Mean 9 degrees, Range 0 – 18 degrees

Macro Topography: Middle 1/3 of slope (2), Lower to Middle 1/3 of slope (1)

Large Rock: Mean 0.9%, Range 0.0 – 2.4%

Small Rock: Mean 0.8%, Range 0.0 – 2.2%

Fines Cover: Mean 19.0%, Range 3.0 – 30.0%

Litter Cover: Mean 77.3%, Range 65.0 – 97%

Soil Texture (field assessed): Fine clay (1), Medium to very fine, sandy loam (1), Fine sandy clay (1)

Geology (field or map data): Mixed metamorphic (2), Sandstone and other sedimentary (1)

San Mateo County Watersheds: San Mateo Bayside (2), Palo Alto (1)

Site Impacts

This association has moderate non-native plant cover (average 40.4%) relative to native cover. Non- native species that occur with highest frequency and abundance include *Avena* spp., *Briza maxima*, *Briza minor*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Centaurea solstitialis*, *Cynosurus echinatus*, *Geranium*

Quercus lobata / grass Association
Quercus lobata Woodland Alliance

dissectum, *Lolium perenne* ssp. *multiflorum*, *Plantago lanceolata*, *Sherardia arvensis*, *Torilis nodosa*, *Trifolium dubium*, and *Vicia sativa*.

Classification Comments

None.

References: Allen et al. 1989, Evens and Kentner 2006, Keeler-Wolf and Evens 2006, Klein et al. 2015

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=3; San Mateo County (n=3): SMAT0023, SMAT0062, SMAT0090

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus lobata</i>	100.0	90.3	30.0	30	30		Y		Y
	<i>Quercus agrifolia</i>	66.7	6.7	2.3	2	5				Y
	<i>Umbellularia californica</i>	33.3	1.9	0.7	2	2				
	<i>Aesculus californica</i>	33.3	0.9	0.3	1	1				
	<i>Pseudotsuga menziesii</i>	33.3	0.2	0.1	0.2	0.2				
Regenerating or Shrubby Trees	<i>Quercus agrifolia</i>	33.3	25.0	0.4	1.2	1.2				
	<i>Arbutus menziesii</i>	33.3	4.2	0.1	0.2	0.2				
	<i>Quercus lobata</i>	33.3	4.2	0.1	0.2	0.2				
Shrub	<i>Toxicodendron diversilobum</i>	100.0	59.4	1.8	0.2	5		Y		Y
	<i>Baccharis pilularis</i>	66.7	21.9	0.4	0.2	1				Y
	<i>Phoradendron villosum</i>	33.3	16.7	0.1	0.2	0.2				
	<i>Prunus emarginata</i>	33.3	1.0	0.1	0.2	0.2				
	<i>Lonicera hispidula</i>	33.3	1.0	0.1	0.2	0.2				
Herb	<i>Bromus diandrus</i>	100.0	10.8	5.1	0.2	10				Y
	<i>Geranium dissectum</i>	100.0	7.1	3.0	2	5				Y
	<i>Vicia sativa</i>	100.0	2.3	1.1	0.2	3				Y

Quercus lobata / grass Association
Quercus lobata Woodland Alliance

<i>Sanicula crassicaulis</i>	100.0	0.5	0.2	0.2	0.2	Y
<i>Avena spp.</i>	66.7	17.9	8.3	10	15	Y
<i>Carduus pycnocephalus</i>	66.7	13.1	5.3	1	15	Y
<i>Lolium perenne</i>	66.7	11.2	5.7	2	15	Y
<i>Galium aparine</i>	66.7	2.0	0.7	1	1	Y
<i>Plantago lanceolata</i>	66.7	1.8	0.7	1	1	Y
<i>Claytonia perfoliata</i>	66.7	1.3	0.4	0.2	1	Y
<i>Elymus glaucus</i>	33.3	17.1	5.0	15	15	
<i>Cynosurus echinatus</i>	33.3	5.7	1.7	5	5	
<i>Bromus hordeaceus</i>	33.3	2.5	1.0	3	3	
<i>Conium maculatum</i>	33.3	1.1	0.3	1	1	
<i>Camissonia ovata</i>	33.3	1.1	0.3	1	1	
<i>Chlorogalum pomeridianum</i>	33.3	1.1	0.3	1	1	
<i>Amsinckia spp.</i>	33.3	0.8	0.3	1	1	
<i>Sisyrinchium bellum</i>	33.3	0.6	0.3	1	1	
<i>Luzula comosa</i>	33.3	0.2	0.1	0.2	0.2	
<i>Achillea millefolium</i>	33.3	0.2	0.1	0.2	0.2	
<i>Taraxacum officinale</i>	33.3	0.2	0.1	0.2	0.2	
<i>Dichelostemma capitatum</i>	33.3	0.2	0.1	0.2	0.2	
<i>Hordeum murinum</i>	33.3	0.2	0.1	0.2	0.2	
<i>Nassella pulchra</i>	33.3	0.2	0.1	0.2	0.2	
<i>Senecio spp.</i>	33.3	0.1	0.1	0.2	0.2	
<i>Briza minor</i>	33.3	0.1	0.1	0.2	0.2	
<i>Scandix pecten-veneris</i>	33.3	0.1	0.1	0.2	0.2	
<i>Sherardia arvensis</i>	33.3	0.1	0.1	0.2	0.2	
<i>Erodium botrys</i>	33.3	0.1	0.1	0.2	0.2	
Non-Vascular						
Moss	66.7	50.0	0.1	0.2	0.2	
Lichen	33.3	16.7	0.1	0.2	0.2	

***Quercus wislizeni* – *Quercus parvula* (tree) Forest & Woodland Alliance**



Common Name: Interior live oak woodland and forest

NVC Alliance Code: A3348. *Quercus douglasii* - *Pinus sabiniana* Woodland Alliance

Statewide Description

Quercus wislizeni or *Quercus parvula* is dominant or co-dominant in the tree canopy with *Acer macrophyllum*, *Aesculus californica*, *Arbutus menziesii*, *Notholithocarpus densiflorus*, *Pinus sabiniana*, *Pseudotsuga menziesii*, *Quercus agrifolia*, *Quercus chrysolepis*, *Quercus douglasii*, *Quercus kelloggii*, *Sequoia sempervirens*, and *Umbellularia californica*.

Quercus parvula var. *shrevei* is a large tree of low elevation, coastal forests in central California. It has been confused with *Quercus wislizeni* for many years. Current taxonomic research individuates *Q. p.* var. *shrevei* from *Q. wislizeni* and also suggests a close relationship to *Q. agrifolia* (Nixon 1980, Kashani and Dodd 2002, Hauser et al. 2017). Most references to stands of *Q. wislizeni* in the mixed evergreen forests of the outer central Coast Ranges (e.g., Sawyer and Keeler-Wolf 1995, Thomas 1961) appear now to be

Q. p. var. *shrevei* (Dodd et al. 2002, Hauser et al. 2017). However, oaks north of San Francisco in the North Coast and North Coast Ranges appear to be a hybrid swarm of *Q. parvula* and *Q. wislizeni*, with some mixing of *Q. agrifolia*, and a new subspecies of *Q. parvula* var. *tamalpaisensis* was noted as a narrow endemic from Mt. Tamalpais

Quercus wislizeni – *Quercus parvula* (tree) Woodland Alliance

(Dodd and Afzal-Rafii 2004, Hauser et al. 2017). For this reason, we have combined the two species into a single alliance since the 2009 publication of *A Manual of California Vegetation, second edition*.

Unlike *Q. agrifolia* and *Q. wislizeni*, *Q. parvula* var. *shrevei* usually occurs as tall single-trunked trees within a matrix of conifers and broadleaf, evergreen trees. Stands are closely associated with but distinct from stands of *Sequoia sempervirens* or *Umbellularia californica* alliances. Stands are typically intermediate in moisture conditions between redwood and coast live oak alliances. Stands of *Q. parvula* often form dense forests on slopes and on the margins of continuous *S. sempervirens* forest patches.

Stands of this extensive alliance vary from savannas to closed forests, but commonly they form woodlands (Allen-Diaz et al. 2007). The tree form of *Q. w.* var. *wislizeni* is also distinguished from the shrub form (var. *frutescens*), but form and height may be only the result of high fire frequencies (White and Sawyer 1995). The species also hybridizes with other oaks. The most commonly encountered hybrid is the deciduous *Q. xmorehus* (*Q. kelloggii* x *Q. wislizeni*).

Local Vegetation Description

The Interior live oak woodland and forest Alliance forms an open to intermittent tree canopy with an open to intermittent shrub understory. The dominant tree is *Quercus parvula* var. *shrevei*, and *Umbellularia californica*, *Arbutus menziesii*, and *Pseudotsuga menziesii* are characteristic or often present.

Regenerating or shrubby trees that are often present include *Arbutus menziesii*, *Pseudotsuga menziesii*, and *Quercus parvula* var. *shrevei*. Commonly associated shrubs include *Rubus ursinus*, *Heteromeles arbutifolia*, *Lonicera hispidula*, *Toxicodendron diversilobum*, *Frangula californica*, and *Symphoricarpos mollis*, and commonly associated herbs include *Dryopteris arguta*, *Adenocaulon bicolor*, *Galium aparine*, and *Myosotis latifolia*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	5.7	0 – 15	27.5	20 – 35
Hardwood	41.7	20 – 55	14.2	5 – 20
Regenerating or Shrubby Tree	14.8	0 – 55.4	2.2	1 – 5
Shrub	36.2	15 – 70	1.9	0.5 – 5
Herb	5.7	2 – 10	0.3	0 – 0.5

Local Membership Rule

The tree form of *Quercus parvula* and/or *Q. wislizeni* dominates or co-dominates in the tree canopy, often with *Arbutus menziesii*, *Pseudotsuga menziesii*, and/or *Umbellularia californica*.

Local Environmental Description

Elevation: Mean 216 m, Range 20 – 325 m

Aspect: SE (1), SW (1), Variable (1), NE (1)

Slope: Mean 13 degrees, Range 10 – 15 degrees

Quercus wislizeni – *Quercus parvula* (tree) Woodland Alliance

Macro Topography: Middle 1/3 of slope (1), Not recorded (1), Upper 1/3 of slope (1), Upper 1/3 of slope to Ridgetop (1)

Large Rock: Mean 0.0%, Range 0.0 – 0.0%

Small Rock: Mean 0.1%, Range 0.0 – 0.2%

Fines Cover: Mean 2.5%, Range 0.2 – 7.0%

Litter Cover: Mean 94.0%, Range 90.0 – 97%

Soil Texture (field assessed): Medium loam (1), Moderately fine sandy clay loam (1), Moderately fine silty clay loam (1), Not recorded (1)

Geology (field or map data): Siltstone (1), Sandstone, shale, and conglomerate (1), Sandstone and other sedimentary (1), Sandstone (1)

San Mateo County Watersheds: Pescadero Creek (2), Ano Nuevo (1), San Mateo Bayside (1)

Site Impacts

This alliance has very low non-native plant cover (average 0.4%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Ehrharta erecta*, *Epipactis helleborine*, *Myosotis latifolia*, and *Torilis arvensis*.

Associations in San Mateo County

- *Quercus (parvula, wislizeni) – Arbutus menziesii / Toxicodendron diversilobum*

Classification Comments

None. Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: Allen et al. 1991, Buck and Evens 2010, Klein et al. 2015

Global Rarity Rank: G4

State Rarity Rank: S4

Surveys Used for Description

Total: N=4; San Mateo County (n=4): SMAT0092, SMAT0282, SMAT0283, SMATR0651

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus parvula</i> var. <i>shrevei</i>	75.0	54.8	21.3	10	55	Y	Y		Y
	<i>Umbellularia californica</i>	75.0	8.6	1.4	0.2	5	Y			Y
	<i>Pseudotsuga menziesii</i>	50.0	11.5	4.3	2	15				Y
	<i>Arbutus menziesii</i>	50.0	16.8	2.6	0.2	10				Y

Quercus wislizeni – *Quercus parvula* (tree) Woodland Alliance

Regenerating or Shrubby Trees	<i>Acer negundo</i>	25.0	5.0	0.8	3	3			
	<i>Quercus agrifolia</i>	25.0	3.3	0.5	2	2			
	<i>Arbutus menziesii</i>	50.0	7.3	1.4	0.2	5.2			Y
	<i>Quercus parvula</i> var. <i>shrevei</i>	50.0	31.2	0.7	0.4	2.2			Y
	<i>Pseudotsuga menziesii</i>	50.0	6.9	0.1	0.2	0.2			Y
	<i>Quercus wislizeni</i>	25.0	22.7	12.6	50.2	50.2			
	<i>Notholithocarpus densiflorus</i>	25.0	5.0	0.1	0.2	0.2			
<i>Umbellularia californica</i>	25.0	1.9	0.1	0.2	0.2				
Shrub	<i>Rubus ursinus</i>	100.0	45.9	25.8	0.2	70	Y	Y	Y
	<i>Toxicodendron diversilobum</i>	75.0	9.2	3.6	0.2	7	Y		Y
	<i>Heteromeles arbutifolia</i>	75.0	3.5	1.4	0.2	5	Y		Y
	<i>Lonicera hispidula</i>	75.0	0.8	0.4	0.2	1	Y		Y
	<i>Frangula californica</i>	50.0	2.4	0.8	0.2	3			Y
	<i>Symphoricarpos mollis</i>	50.0	1.4	0.6	0.2	2			Y
	<i>Arctostaphylos crustacea</i>	25.0	13.4	5.0	20	20			
	<i>Cornus sericea</i>	25.0	9.4	3.0	12	12			
	<i>Salix lasiolepis</i>	25.0	7.8	2.5	10	10			
	<i>Baccharis pilularis</i>	25.0	3.1	1.0	4	4			
	<i>Adenostoma fasciculatum</i>	25.0	1.3	0.5	2	2			
	<i>Corylus cornuta</i>	25.0	0.6	0.3	1	1			
	<i>Pickeringia montana</i>	25.0	0.7	0.3	1	1			
	<i>Holodiscus discolor</i>	25.0	0.1	0.1	0.2	0.2			
	<i>Ceanothus oliganthus</i>	25.0	0.1	0.1	0.2	0.2			
	<i>Rosa gymnocarpa</i>	25.0	0.1	0.1	0.2	0.2			
	<i>Sambucus racemosa</i>	25.0	0.1	0.1	0.2	0.2			
Herb	<i>Dryopteris arguta</i>	75.0	16.1	0.6	0.2	1	Y		Y
	<i>Myosotis latifolia</i>	50.0	7.7	0.3	0.2	1			Y
	<i>Galium aparine</i>	50.0	3.0	0.1	0.2	0.2			Y
	<i>Adenocaulon bicolor</i>	50.0	2.9	0.1	0.2	0.2			Y
	<i>Scrophularia californica</i>	25.0	25.0	0.5	2	2			
	<i>Pentagramma triangularis</i>	25.0	8.3	0.3	1	1			
	<i>Maianthemum</i>	25.0	1.8	0.1	0.2	0.2			

Quercus wislizeni – *Quercus parvula* (tree) Woodland Alliance

	<i>racemosum</i>							
	<i>Madia madioides</i>	25.0	1.2	0.1	0.2	0.2		
	<i>Torilis arvensis</i>	25.0	1.8	0.1	0.2	0.2		
	<i>Nemophila parviflora</i>	25.0	1.8	0.1	0.2	0.2		
	<i>Osmorhiza berteroi</i>	25.0	1.2	0.1	0.2	0.2		
	<i>Polystichum munitum</i>	25.0	1.2	0.1	0.2	0.2		
	<i>Pseudognaphalium spp.</i>	25.0	1.7	0.1	0.2	0.2		
	<i>Trillium spp.</i>	25.0	1.8	0.1	0.2	0.2		
	<i>Marah fabaceus</i>	25.0	1.8	0.1	0.2	0.2		
	<i>Stachys bullata</i>	25.0	1.8	0.1	0.2	0.2		
	<i>Calamagrostis nutkaensis</i>	25.0	1.2	0.1	0.2	0.2		
	<i>Bromus carinatus</i>	25.0	1.8	0.1	0.2	0.2		
	<i>Bromus laevipes</i>	25.0	1.8	0.1	0.2	0.2		
	<i>Iris spp.</i>	25.0	1.2	0.1	0.2	0.2		
	<i>Chlorogalum pomeridianum</i>	25.0	1.2	0.1	0.2	0.2		
	<i>Clinopodium douglasii</i>	25.0	1.2	0.1	0.2	0.2		
	<i>Cynoglossum grande</i>	25.0	1.8	0.1	0.2	0.2		
	<i>Epipactis helleborine</i>	25.0	1.8	0.1	0.2	0.2		
	<i>Galium californicum</i>	25.0	1.2	0.1	0.2	0.2		
	<i>Galium porrigens</i>	25.0	1.7	0.1	0.2	0.2		
	<i>Hierochloe occidentalis</i>	25.0	1.2	0.1	0.2	0.2		
	<i>Iris douglasiana</i>	25.0	1.7	0.1	0.2	0.2		
	<i>Artemisia douglasiana</i>	25.0	1.8	0.1	0.2	0.2		
	<i>Ehrharta erecta</i>	25.0	1.7	0.1	0.2	0.2		
Non-Vascular								
	Moss	75.0	47.7	0.6	0.2	2	Y	Y
	Lichen	75.0	27.3	0.2	0.2	0.2	Y	Y

Quercus (parvula, wislizeni) – Arbutus menziesii / Toxicodendron diversilobum Association

Common Name: Interior Live Oak – Madrone / Poison-oak Woodland

Alliance: *Quercus wislizeni* – *Quercus parvula* (tree) Forest & Woodland Alliance

Local Vegetation Description

The Interior Live Oak – Madrone / Poison-oak Association forms an intermittent tree canopy with an open to continuous shrub understory. *Quercus parvula* or *Quercus wislizeni* is the dominant tree, while *Arbutus menziesii* is often present. Commonly associated shrubs include *Toxicodendron diversilobum*, *Heteromeles arbutifolia*, *Lonicera hispidula*, *Rubus ursinus*, *Frangula californica*, and *Symphoricarpos mollis*. Commonly associated herbs include *Dryopteris arguta* and *Adenocaulon bicolor*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	1.0	0 – 2	27.5	20 – 35
Hardwood	52.5	50 – 55	12.5	5 – 20
Regenerating or Shrubby Tree	19.3	0 – 55.4	2.5	1 – 5
Shrub	46.0	32 – 70	2.1	0.5 – 5
Herb	3.5	2 – 5	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 187 m, Range 20 – 325 m

Aspect: NE (1), SE (1), SW (1)

Slope: Mean 13 degrees, Range 10 – 15 degrees

Macro Topography: Middle 1/3 of slope (1), Not recorded (1), Upper 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 3.6%, Range 0.2 – 7.0%

Litter Cover: Mean 92.5%, Range 90.0 – 95%

Soil Texture (field assessed): Medium loam (1), Moderately fine silty clay loam (1), Not recorded (1)

Geology (field or map data): Sandstone (1), Sandstone, shale, and conglomerate (1), Sandstone and other sedimentary (1)

San Mateo County Watersheds: Ano Nuevo (1), Pescadero Creek (1), San Mateo Bayside (1)

Site Impacts

This association has very low non-native plant cover (average 0.3%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Myosotis latifolia*.

Quercus (parvula, wislizeni) – Arbutus menziesii / Toxicodendron diversilobum Association
Quercus wislizeni – Quercus parvula (tree) Woodland Alliance

Classification Comments

Due to hybridization and morphological similarity between the species, plants identified as *Quercus wislizeni* may be *Quercus parvula*, which has been found to be the most widespread genotype in San Mateo County (Dodd and Afzul-Rafii 2004, Hauser et al. 2017).

References: Allen et al. 1991, Buck and Evens 2010, Klein et al. 2015

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** N

Surveys Used for Description

Total: N=3; San Mateo County (n=3): SMAT0092, SMAT0282, SMATR0651

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus parvula</i> var. <i>shrevei</i>	75.0	54.8	21.3	10	55		Y		Y
	<i>Umbellularia californica</i>	75.0	8.6	1.4	0.2	5				Y
	<i>Arbutus menziesii</i>	50.0	16.8	2.6	0.2	10				Y
	<i>Pseudotsuga menziesii</i>	50.0	11.5	4.3	2	15				Y
	<i>Acer negundo</i>	25.0	5.0	0.8	3	3				
	<i>Quercus agrifolia</i>	25.0	3.3	0.5	2	2				
Regenerating or Shrubby Trees	<i>Quercus parvula</i> var. <i>shrevei</i>	50.0	31.2	0.7	0.4	2.2				Y
	<i>Arbutus menziesii</i>	50.0	7.3	1.4	0.2	5.2				Y
	<i>Pseudotsuga menziesii</i>	50.0	6.9	0.1	0.2	0.2				Y
	<i>Quercus wislizeni</i>	25.0	22.7	12.6	50.2	50.2				
	<i>Notholithocarpus densiflorus</i>	25.0	5.0	0.1	0.2	0.2				
	<i>Umbellularia californica</i>	25.0	1.9	0.1	0.2	0.2				
Shrub	<i>Rubus ursinus</i>	100.0	45.9	25.8	0.2	70			Y	Y
	<i>Toxicodendron diversilobum</i>	75.0	9.2	3.6	0.2	7				Y
	<i>Heteromeles arbutifolia</i>	75.0	3.5	1.4	0.2	5				Y
	<i>Lonicera hispidula</i>	75.0	0.8	0.4	0.2	1				Y
	<i>Frangula californica</i>	50.0	2.4	0.8	0.2	3				Y

Quercus (*parvula*, *wislizeni*) – *Arbutus menziesii* / *Toxicodendron diversilobum* Association
Quercus wislizeni – *Quercus parvula* (tree) Woodland Alliance

	<i>Symphoricarpos mollis</i>	50.0	1.4	0.6	0.2	2	Y
	<i>Arctostaphylos crustacea</i>	25.0	13.4	5.0	20	20	
	<i>Cornus sericea</i>	25.0	9.4	3.0	12	12	
	<i>Salix lasiolepis</i>	25.0	7.8	2.5	10	10	
	<i>Baccharis pilularis</i>	25.0	3.1	1.0	4	4	
	<i>Adenostoma fasciculatum</i>	25.0	1.3	0.5	2	2	
	<i>Pickeringia montana</i>	25.0	0.7	0.3	1	1	
	<i>Corylus cornuta</i>	25.0	0.6	0.3	1	1	
	<i>Ceanothus oliganthus</i>	25.0	0.1	0.1	0.2	0.2	
	<i>Holodiscus discolor</i>	25.0	0.1	0.1	0.2	0.2	
	<i>Rosa gymnocarpa</i>	25.0	0.1	0.1	0.2	0.2	
	<i>Sambucus racemosa</i>	25.0	0.1	0.1	0.2	0.2	
Herb							
	<i>Dryopteris arguta</i>	75.0	16.1	0.6	0.2	1	Y
	<i>Myosotis latifolia</i>	50.0	7.7	0.3	0.2	1	Y
	<i>Galium aparine</i>	50.0	3.0	0.1	0.2	0.2	Y
	<i>Adenocaulon bicolor</i>	50.0	2.9	0.1	0.2	0.2	Y
	<i>Scrophularia californica</i>	25.0	25.0	0.5	2	2	
	<i>Pentagramma triangularis</i>	25.0	8.3	0.3	1	1	
	<i>Epipactis helleborine</i>	25.0	1.8	0.1	0.2	0.2	
	<i>Nemophila parviflora</i>	25.0	1.8	0.1	0.2	0.2	
	<i>Maianthemum racemosum</i>	25.0	1.8	0.1	0.2	0.2	
	<i>Stachys bullata</i>	25.0	1.8	0.1	0.2	0.2	
	<i>Marah fabaceus</i>	25.0	1.8	0.1	0.2	0.2	
	<i>Torilis arvensis</i>	25.0	1.8	0.1	0.2	0.2	
	<i>Trillium spp.</i>	25.0	1.8	0.1	0.2	0.2	
	<i>Bromus carinatus</i>	25.0	1.8	0.1	0.2	0.2	
	<i>Cynoglossum grande</i>	25.0	1.8	0.1	0.2	0.2	
	<i>Artemisia douglasiana</i>	25.0	1.8	0.1	0.2	0.2	
	<i>Bromus laevipes</i>	25.0	1.8	0.1	0.2	0.2	
	<i>Iris douglasiana</i>	25.0	1.7	0.1	0.2	0.2	
	<i>Pseudognaphalium spp.</i>	25.0	1.7	0.1	0.2	0.2	
	<i>Galium porrigens</i>	25.0	1.7	0.1	0.2	0.2	
	<i>Ehrharta erecta</i>	25.0	1.7	0.1	0.2	0.2	
	<i>Chlorogalum pomeridianum</i>	25.0	1.2	0.1	0.2	0.2	
	<i>Calamagrostis nutkaensis</i>	25.0	1.2	0.1	0.2	0.2	
	<i>Polystichum munitum</i>	25.0	1.2	0.1	0.2	0.2	
	<i>Iris spp.</i>	25.0	1.2	0.1	0.2	0.2	
	<i>Hierochloe occidentalis</i>	25.0	1.2	0.1	0.2	0.2	
	<i>Galium californicum</i>	25.0	1.2	0.1	0.2	0.2	
	<i>Clinopodium douglasii</i>	25.0	1.2	0.1	0.2	0.2	

Quercus (parvula, wislizeni) – Arbutus menziesii / Toxicodendron diversilobum Association
Quercus wislizeni – Quercus parvula (tree) Woodland Alliance

	<i>Madia madioides</i>	25.0	1.2	0.1	0.2	0.2		
	<i>Osmorhiza berteroi</i>	25.0	1.2	0.1	0.2	0.2		
Non-Vascular								
	Moss	75.0	47.7	0.6	0.2	2	Y	Y
	Lichen	75.0	27.3	0.2	0.2	0.2		Y

***Salix gooddingii* – *Salix laevigata* Forest & Woodland Alliance**



Common Name: Goodding's willow – red willow riparian woodland and forest

NVC Alliance Code: A3752. *Salix gooddingii* - *Salix laevigata* Riparian Forest Alliance

Statewide Description

Salix gooddingii and/or *Salix laevigata* is dominant or co-dominant in the tree or shrub canopy with *Acer negundo*, *Aesculus californica*, *Alnus rhombifolia*, *Calocedrus decurrens*, *Fraxinus latifolia*, *Pinus sabiniana*, *Platanus racemosa*, *Populus fremontii*, *Quercus agrifolia*, *Quercus chrysolepis*, *Quercus lobata*, *Salix lucida* var. *lasiandra* or *Washingtonia filifera*. Shrubs include *Baccharis salicifolia*, *Cornus sericea*, *Rosa californica*, *Rubus armeniacus*, *Salix exigua*, *Salix lasiolepis* or *Sambucus nigra*.

Salix gooddingii and *Salix laevigata* were formerly described and treated as separate alliances, but the two types have been merged since they often occur together and/or share similar habitats.

Salix laevigata grows commonly with various willows and other riparian trees, but it also can solely dominate sites. Researchers have mainly recognized mixed associations that include *S. laevigata* or *S. gooddingii* in the *Alnus rhombifolia*, *Populus fremontii*, and *Quercus agrifolia* alliances, too. Various associations of *Salix laevigata*-*Salix lasiolepis* exist, where several studies done in coastal and southern California describe mainly associations characterized by two trees. We need more sampling and study to understand this complex.

Salix gooddingii is a common riparian tree or shrub in the West, and stands of the species occur in the southwestern United States and northern Mexico (NatureServe 2007a). Mixed and pure stands of *S. gooddingii* occur regularly in the Central Valley and southern California. When *S. gooddingii* or *S. laevigata* co-dominates with *Populus fremontii*, the alliance is determined as *Populus fremontii* - *Fraxinus velutina* - *Salix gooddingii* Alliance.

Local Vegetation Description

The Goodding's willow – red willow riparian woodland and forest Alliance forms an open to intermittent tree canopy with an open to continuous shrub understory. *Salix laevigata* are characteristic or often present. Regenerating or shrubby trees that are often present include *Salix laevigata*. Commonly associated shrubs include *Rubus ursinus*, *Ribes sanguineum*, *Sambucus nigra*, and *Toxicodendron diversilobum*, and commonly associated herbs include *Heracleum maximum*, *Marah fabaceus*, *Polystichum munitum*, *Urtica dioica*, *Claytonia perfoliata*, *Conium maculatum*, *Scrophularia californica*, and *Stachys bullata*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	17.6	11 – 50	12.5	10 – 15
Regenerating or Shrubby Tree	12.1	0 – 27.0	no data	no data
Shrub	47.4	13 – 80	1.5	1 – 2
Herb	41.3	12 – 90	0.3	0 – 0.5

Local Membership Rule

Salix laevigata dominates along streams, rivers, ditches, floodplains, and lake edges. Associated trees and shrubs include *Alnus rhombifolia*, *Populus fremontii*, *Quercus agrifolia*, *Rubus*, *Salix*, and others.

Local Environmental Description

Elevation: Mean 152 m, Range 7 – 262 m

Aspect: SE (4), SW (1)

Slope: Mean 2 degrees, Range 2 – 3 degrees

Macro Topography: Bottom (3), Lower 1/3 of slope (1), Wash (channel bed) (1)

Large Rock: Mean 1.2%, Range 0.0 – 4.0%

Small Rock: Mean 6.4%, Range 0.0 – 20.0%

Fines Cover: Mean 55.0%, Range 55.0 – 55.0%

Litter Cover: Mean 48.0%, Range 15.0 – 75%

Soil Texture (field assessed): Medium to very fine, sandy loam (3), Coarse, loamy sand (1), Fine sand (1)

Geology (field or map data): Sandstone (2), Franciscan melange (2), Granitic (1)

San Mateo County Watersheds: San Mateo Bayside (3), Ano Nuevo (1), Half Moon Bay (1)

Site Impacts

This alliance has low non-native plant cover (average 2.4%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anthriscus caucalis*, *Brassica nigra*, *Cakile maritima*, *Carduus pycnocephalus*, *Carpobrotus edulis*, *Cirsium arvense*, *Cirsium vulgare*, *Conium maculatum*, *Ehrharta erecta*, *Festuca arundinacea*, *Foeniculum vulgare*, *Geranium dissectum*, *Myosotis latifolia*, *Oxalis pes-caprae*, *Picris echioides*, *Plantago lanceolata*, *Sherardia arvensis*, *Sonchus oleraceus*, and *Stellaria media*.

Associations in San Mateo County

- *Salix laevigata* / (*Cornus sericea* – *Ribes* spp.) / *Scirpus microcarpus* – *Carex* spp.
- *Salix laevigata* / *Salix lasiolepis*

Classification Comments

None.

References: AECOM 2013, Buck-Diaz et al. 2012, Evens and Kentner 2006, Evens and San 2005, Keeler-Wolf and Evens 2006, Keeler-Wolf and Vaghti 2000, Klein and Evens 2005, Klein et al. 2007, Klein et al. 2015, Reyes et al. 2020a, Stillwater Sciences and URS 2007, VegCAMP 2015a

Global Rarity Rank: G4

State Rarity Rank: S3

Surveys Used for Description

Total: N=5; San Mateo County (n=5): GGNRA341, GGNRA345, GGNRA361, GGNRA365, SMAT0647

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Salix laevigata</i>	60.0	39.2	10.2	6	35				Y
	<i>Quercus agrifolia</i>	20.0	6.0	3.0	15	15				
	<i>Salix</i> spp.	20.0	15.4	2.0	10	10				
	<i>Salix lasiandra</i>	20.0	9.1	1.0	5	5				
	<i>Acer macrophyllum</i>	20.0	5.7	0.8	4	4				
	<i>Alnus rubra</i>	20.0	4.6	0.6	3	3				
Regenerating or Shrubby Trees	<i>Salix laevigata</i>	60.0	54.2	6.2	5	20				Y

Salix gooddingii – *Salix laevigata* Woodland Alliance

	<i>Aesculus californica</i>	40.0	2.6	0.5	0.2	2.2		
	<i>Salix gooddingii</i>	20.0	17.9	4.0	20	20		
	<i>Pseudotsuga menziesii</i>	20.0	5.2	1.4	7	7		
	<i>Quercus agrifolia</i>	20.0	0.2	0.0	0.2	0.2		
Shrub								
	<i>Rubus ursinus</i>	100.0	11.1	5.7	0.2	15	Y	Y
	<i>Toxicodendron diversilobum</i>	60.0	12.0	8.4	5	30		Y
	<i>Ribes sanguineum</i>	60.0	5.8	4.4	0.2	20		Y
	<i>Sambucus nigra</i>	60.0	0.6	0.5	0.2	2		Y
	<i>Salix lasiolepis</i>	40.0	27.8	8.0	10	30		
	<i>Rubus parviflorus</i>	40.0	7.0	2.4	0.2	12		
	<i>Lonicera hispidula</i>	40.0	1.2	0.6	1.2	2		
	<i>Ribes californicum</i>	40.0	0.2	0.1	0.2	0.2		
	<i>Cornus sericea</i>	20.0	15.7	10.0	50	50		
	<i>Morella californica</i>	20.0	10.4	3.6	18	18		
	<i>Cornus glabrata</i>	20.0	2.6	1.2	6	6		
	<i>Symphoricarpos mollis</i>	20.0	1.0	0.8	4	4		
	<i>Ribes divaricatum</i>	20.0	1.0	0.8	4	4		
	<i>Lonicera involucrata</i>	20.0	0.5	0.4	2.2	2.2		
	<i>Sambucus racemosa</i>	20.0	1.5	0.2	1	1		
	<i>Rosa californica</i>	20.0	0.2	0.2	1	1		
	<i>Frangula purshiana</i>	20.0	0.2	0.2	1	1		
	<i>Vaccinium ovatum</i>	20.0	0.1	0.0	0.2	0.2		
	<i>Baccharis pilularis</i>	20.0	0.0	0.0	0.2	0.2		
	<i>Baccharis salicifolia</i>	20.0	0.3	0.0	0.2	0.2		
	<i>Rubus spectabilis</i>	20.0	0.3	0.0	0.2	0.2		
	<i>Lupinus arboreus</i>	20.0	0.3	0.0	0.2	0.2		
	<i>Euonymus occidentalis</i> <i>var. occidentalis</i>	20.0	0.1	0.0	0.2	0.2		
	<i>Lepechinia calycina</i>	20.0	0.0	0.0	0.2	0.2		
Herb								
	<i>Marah fabaceus</i>	100.0	6.7	3.6	1	12	Y	Y
	<i>Urtica dioica</i>	80.0	12.0	5.1	0.2	19	Y	Y
	<i>Polystichum munitum</i>	80.0	2.8	1.7	0.2	4.2	Y	Y
	<i>Heracleum maximum</i>	80.0	7.1	1.6	0.2	3	Y	Y
	<i>Stachys bullata</i>	60.0	2.3	0.4	0.2	1		Y
	<i>Scrophularia californica</i>	60.0	0.9	0.4	0.2	1		Y
	<i>Conium maculatum</i>	60.0	0.9	0.3	0.2	1.2		Y
	<i>Claytonia perfoliata</i>	60.0	1.0	0.3	0.2	1		Y
	<i>Carex nudata</i>	40.0	7.1	6.2	6	25		
	<i>Oenanthe sarmentosa</i>	40.0	5.5	5.4	2	25		

Salix gooddingii – *Salix laevigata* Woodland Alliance

<i>Stachys ajugoides</i>	40.0	3.9	3.0	5	10
<i>Dryopteris arguta</i>	40.0	2.1	2.1	0.2	10.2
<i>Aquilegia formosa</i>	40.0	1.8	0.8	1	3
<i>Thalictrum fendleri</i>	40.0	4.5	0.7	0.2	3.2
<i>Equisetum arvense</i>	40.0	0.8	0.6	1	2.2
<i>Anthriscus caucalis</i>	40.0	2.9	0.4	0.2	2
<i>Athyrium filix-femina</i>	40.0	0.8	0.4	0.2	2
<i>Myosotis latifolia</i>	40.0	0.7	0.2	0.2	1
<i>Galium aparine</i>	40.0	0.2	0.1	0.2	0.2
<i>Brassica nigra</i>	40.0	0.4	0.1	0.2	0.2
<i>Cardamine oligosperma</i>	40.0	0.4	0.1	0.2	0.2
<i>Stellaria media</i>	40.0	0.4	0.1	0.2	0.2
<i>Actaea rubra</i>	20.0	6.4	2.0	10	10
<i>Trillium albidum</i>	20.0	1.0	1.0	5	5
<i>Elymus californicus</i>	20.0	0.8	0.8	4.2	4.2
<i>Juncus arcticus</i>	20.0	4.5	0.8	4	4
<i>Schoenoplectus americanus</i>	20.0	4.5	0.8	4	4
<i>Pteridium aquilinum</i>	20.0	0.6	0.6	3.2	3.2
<i>Cyperus spp.</i>	20.0	3.4	0.6	3	3
<i>Maianthemum stellatum</i>	20.0	1.9	0.6	3	3
<i>Scirpus spp.</i>	20.0	2.8	0.4	2	2
<i>Potentilla anserina</i>	20.0	2.3	0.4	2	2
<i>Galium porrigens</i>	20.0	0.2	0.2	1	1
<i>Carduus pycnocephalus</i>	20.0	0.6	0.2	1	1
<i>Oxalis oregana</i>	20.0	0.2	0.2	1	1
<i>Ehrharta erecta</i>	20.0	1.1	0.2	1	1
<i>Artemisia douglasiana</i>	20.0	0.2	0.1	0.4	0.4
<i>Solidago spp.</i>	20.0	0.3	0.0	0.2	0.2
<i>Sherardia arvensis</i>	20.0	0.1	0.0	0.2	0.2
<i>Stachys stricta</i>	20.0	0.3	0.0	0.2	0.2
<i>Sonchus oleraceus</i>	20.0	0.1	0.0	0.2	0.2
<i>Rumex spp.</i>	20.0	0.2	0.0	0.2	0.2
<i>Polypodium scolieri</i>	20.0	0.1	0.0	0.2	0.2
<i>Solanum spp.</i>	20.0	0.1	0.0	0.2	0.2
<i>Oxalis pes-caprae</i>	20.0	0.2	0.0	0.2	0.2
<i>Carpobrotus edulis</i>	20.0	0.2	0.0	0.2	0.2
<i>Plantago lanceolata</i>	20.0	0.1	0.0	0.2	0.2
<i>Plantago spp.</i>	20.0	0.2	0.0	0.2	0.2
<i>Brassica spp.</i>	20.0	0.0	0.0	0.2	0.2
<i>Cakile maritima</i>	20.0	0.2	0.0	0.2	0.2
<i>Carex spp.</i>	20.0	0.0	0.0	0.2	0.2
<i>Cirsium arvense</i>	20.0	0.1	0.0	0.2	0.2
<i>Cirsium vulgare</i>	20.0	0.1	0.0	0.2	0.2
<i>Delphinium uliginosum</i>	20.0	0.1	0.0	0.2	0.2
<i>Elymus spp.</i>	20.0	0.1	0.0	0.2	0.2
<i>Festuca arundinacea</i>	20.0	0.2	0.0	0.2	0.2
<i>Foeniculum vulgare</i>	20.0	0.2	0.0	0.2	0.2

Salix gooddingii – *Salix laevigata* Woodland Alliance

	<i>Galium californicum</i>	20.0	0.1	0.0	0.2	0.2
	<i>Geranium dissectum</i>	20.0	0.3	0.0	0.2	0.2
	<i>Juncus effusus</i>	20.0	0.2	0.0	0.2	0.2
	<i>Picris echioides</i>	20.0	0.2	0.0	0.2	0.2
	<i>Osmorhiza brachypoda</i>	20.0	0.0	0.0	0.2	0.2
	<i>Oxalis spp.</i>	20.0	0.1	0.0	0.2	0.2
	<i>Adiantum jordanii</i>	20.0	0.1	0.0	0.2	0.2
	<i>Equisetum spp.</i>	20.0	0.2	0.0	0.2	0.2
Non-Vascular						
	Moss	20.0	10.0	0.0	0.2	0.2
	Lichen	20.0	10.0	0.0	0.2	0.2

***Salix laevigata* / (*Cornus sericea* – *Ribes* spp.) / *Scirpus microcarpus* – *Carex* spp. Association**

Common Name: Red Willow / (American Dogwood – Currant) / Small-fruited Bulrush – Sedge Woodland

Alliance: *Salix gooddingii* – *Salix laevigata* Forest & Woodland Alliance

Local Vegetation Description

The Red Willow / (American Dogwood – Currant) / Small-fruited Bulrush – Sedge Association forms an open to intermittent tree canopy with an open to continuous shrub understory. The dominant tree is *Salix laevigata* which is often regenerating. Commonly associated shrubs include *Cornus sericea*, *Rubus ursinus*, and *Toxicodendron diversilobum*, and commonly associated herbs include *Dryopteris arguta*, *Heracleum maximum*, *Marah fabaceus*. and *Polystichum munitum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	1.0	0 – 3	10.0	5 – 15
Hardwood	32.8	11 – 57	7.5	5 – 10
Regenerating or Shrubby Tree	7.6	0 – 27	no data	no data
Shrub	40.6	11 – 70	no data	no data
Herb	47.2	12 – 90	0.5	0 – 1

Local Environmental Description

Elevation: Mean 292 m, Range 163 – 463 m

Aspect: SE (3), Variable (1), Flat (1)

Slope: Mean 2 degrees, Range 0 – 3 degrees

Macro Topography: Lower 1/3 of slope (2), Bottom (2), Wash (channel bed) (1)

Large Rock: Mean 1.3%, Range 0.0 – 4.0%

Small Rock: Mean 7.6%, Range 0.0 – 20%

Fines Cover: Mean 23.0%, Range 23 – 23%

Litter Cover: Mean 64.5%, Range 45 – 75%

Soil Texture (field assessed): Medium to very fine, sandy loam (2), Medium silt (1), Moderately fine silty clay loam (1), Coarse, loamy sand (1)

Geology (field or map data): Franciscan melange (4), Granitic (1)

San Mateo County Watersheds: San Mateo Bayside (2), Half Moon Bay (1)

Other Watersheds, Marin Co.: Lagunitas Creek (2)

Site Impacts

This association has very low non-native plant cover (average 0.9%) relative to native cover. Non-native species that occur with highest frequency and abundance include

Salix laevigata / (*Cornus sericea* – *Ribes* spp.) / *Scirpus microcarpus* – *Carex* spp. Association
Salix gooddingii – *Salix laevigata* Woodland Alliance

Brassica nigra and *Conium maculatum*.

Classification Comments

The name of this association has been updated from *Salix laevigata* / *Cornus sericea* / *Scirpus microcarpus* Association to broaden its definition. Since the number of surveys of this association in San Mateo County is low, data from nearby counties were included.

References: Evens and Kentner 2006

Global Rarity Rank: G3 **State Rarity Rank:** S3? **State Rare:** Y

Surveys Used for Description

Total: N=5; San Mateo County (n=3): GGNRA341, GGNRA361, GGNRA365

Marin County (n=2): MMWD0408, MMWD0410

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Salix laevigata</i>	100.0	65.3	17.0	6	35		Y		Y
	<i>Salix lasiandra</i>	33.3	15.2	1.7	5	5				
	<i>Quercus agrifolia</i>	33.3	10.0	5.0	15	15				
	<i>Acer macrophyllum</i>	33.3	9.5	1.3	4	4				
Regenerating or Shrubby Trees	<i>Salix laevigata</i>	100.0	90.3	10.3	5	20		Y		Y
	<i>Pseudotsuga menziesii</i>	33.3	8.6	2.3	7	7				
	<i>Aesculus californica</i>	33.3	1.1	0.1	0.2	0.2				
Shrub	<i>Rubus ursinus</i>	100.0	13.4	8.7	3.2	15				Y
	<i>Toxicodendron diversilobum</i>	66.7	14.9	11.7	5	30				Y
	<i>Rubus parviflorus</i>	66.7	11.7	4.1	0.2	12				Y
	<i>Ribes sanguineum</i>	66.7	8.3	6.7	0.2	20				Y
	<i>Lonicera hispidula</i>	66.7	2.0	1.1	1.2	2				Y
	<i>Sambucus nigra</i>	66.7	0.9	0.7	0.2	2				Y
	<i>Cornus sericea</i>	33.3	26.1	16.7	50	50				

Salix laevigata / (*Cornus sericea* – *Ribes* spp.) / *Scirpus microcarpus* – *Carex* spp. Association
Salix gooddingii – *Salix laevigata* Woodland Alliance

<i>Morella californica</i>	33.3	17.3	6.0	18	18
<i>Symphoricarpos mollis</i>	33.3	1.6	1.3	4	4
<i>Ribes divaricatum</i>	33.3	1.6	1.3	4	4
<i>Lonicera involucrata</i>	33.3	0.9	0.7	2.2	2.2
<i>Frangula purshiana</i>	33.3	0.4	0.3	1	1
<i>Rosa californica</i>	33.3	0.4	0.3	1	1
<i>Vaccinium ovatum</i>	33.3	0.2	0.1	0.2	0.2
<i>Ribes californicum</i>	33.3	0.1	0.1	0.2	0.2
<i>Baccharis pilularis</i>	33.3	0.1	0.1	0.2	0.2
<i>Lepechinia calycina</i>	33.3	0.1	0.1	0.2	0.2

Herb

<i>Marah fabaceus</i>	100.0	8.1	5.3	1	12	Y
<i>Polystichum munitum</i>	100.0	4.4	2.8	0.2	4.2	Y
<i>Urtica dioica</i>	66.7	13.3	6.5	0.4	19	Y
<i>Carex nudata</i>	66.7	11.8	10.3	6	25	Y
<i>Oenanthe sarmentosa</i>	66.7	9.2	9.0	2	25	Y
<i>Heracleum maximum</i>	66.7	8.2	1.7	2	3	Y
<i>Thalictrum fendleri</i>	66.7	7.5	1.1	0.2	3.2	Y
<i>Stachys ajugoides</i>	66.7	6.4	5.0	5	10	Y
<i>Athyrium filix-femina</i>	66.7	1.4	0.7	0.2	2	Y
<i>Equisetum arvense</i>	66.7	1.3	1.1	1	2.2	Y
<i>Conium maculatum</i>	66.7	1.2	0.5	0.2	1.2	Y
<i>Cardamine oligosperma</i>	66.7	0.6	0.1	0.2	0.2	Y
<i>Brassica nigra</i>	66.7	0.6	0.1	0.2	0.2	Y
<i>Claytonia perfoliata</i>	66.7	0.6	0.1	0.2	0.2	Y
<i>Scrophularia californica</i>	66.7	0.4	0.4	0.2	1	Y
<i>Anthriscus caucalis</i>	33.3	4.6	0.7	2	2	
<i>Scirpus spp.</i>	33.3	4.6	0.7	2	2	
<i>Dryopteris arguta</i>	33.3	3.2	3.4	10.2	10.2	
<i>Stachys bullata</i>	33.3	2.3	0.3	1	1	
<i>Aquilegia formosa</i>	33.3	2.0	1.0	3	3	
<i>Trillium albidum</i>	33.3	1.6	1.7	5	5	
<i>Elymus californicus</i>	33.3	1.3	1.4	4.2	4.2	
<i>Pteridium aquilinum</i>	33.3	1.0	1.1	3.2	3.2	
<i>Solidago spp.</i>	33.3	0.5	0.1	0.2	0.2	
<i>Stellaria media</i>	33.3	0.5	0.1	0.2	0.2	
<i>Geranium dissectum</i>	33.3	0.5	0.1	0.2	0.2	
<i>Stachys stricta</i>	33.3	0.5	0.1	0.2	0.2	
<i>Galium porrigens</i>	33.3	0.3	0.3	1	1	
<i>Oxalis oregana</i>	33.3	0.3	0.3	1	1	
<i>Artemisia douglasiana</i>	33.3	0.3	0.1	0.4	0.4	
<i>Delphinium uliginosum</i>	33.3	0.1	0.1	0.2	0.2	
<i>Elymus spp.</i>	33.3	0.1	0.1	0.2	0.2	
<i>Galium aparine</i>	33.3	0.1	0.1	0.2	0.2	
<i>Sonchus oleraceus</i>	33.3	0.1	0.1	0.2	0.2	
<i>Plantago lanceolata</i>	33.3	0.1	0.1	0.2	0.2	
<i>Cirsium arvense</i>	33.3	0.1	0.1	0.2	0.2	

Salix laevigata / (*Cornus sericea* – *Ribes* spp.) / *Scirpus microcarpus* – *Carex* spp. Association
Salix gooddingii – *Salix laevigata* Woodland Alliance

	<i>Sherardia arvensis</i>	33.3	0.1	0.1	0.2	0.2
	<i>Oxalis spp.</i>	33.3	0.1	0.1	0.2	0.2
	<i>Osmorhiza brachypoda</i>	33.3	0.1	0.1	0.2	0.2
	<i>Myosotis latifolia</i>	33.3	0.1	0.1	0.2	0.2
	<i>Carex spp.</i>	33.3	0.1	0.1	0.2	0.2
	<i>Brassica spp.</i>	33.3	0.1	0.1	0.2	0.2
Non-Vascular						
	Lichen	33.3	16.7	0.1	0.2	0.2
	Moss	33.3	16.7	0.1	0.2	0.2

***Salix laevigata* / *Salix lasiolepis* Association**

Common Name: Red Willow / Arroyo Willow Woodland

Alliance: *Salix gooddingii* – *Salix laevigata* Forest & Woodland Alliance

Local Vegetation Description

The Red Willow / Arroyo Willow Association forms an open tree canopy with an open shrub understory. *Alnus rubra*, *Fraxinus latifolia*, *Salix* spp., and *Salix laevigata* are characteristic trees or often present. Regenerating or shrubby trees that are often present include *Alnus rubra* and *Fraxinus latifolia*.

Commonly associated shrubs include *Salix lasiolepis*, *Baccharis salicifolia*, *Lupinus arboreus*, *Rubus armeniacus*, *Rubus spectabilis*, *Rubus ursinus*, and *Sambucus racemosa*, and commonly associated herbs include *Juncus effusus*, *Urtica dioica*, *Athyrium filix-femina*, *Cakile maritima*, *Carex obnupta*, *Carpobrotus edulis*, *Cyperus* spp., *Ehrharta erecta*, *Epilobium ciliatum*, *Equisetum* spp., *Equisetum arvense*, *Festuca arundinacea*, *Foeniculum vulgare*, *Heracleum maximum*, *Holcus lanatus*, *Juncus arcticus*, *Marah fabaceus*, *Oenanthe sarmentosa*, *Oxalis pes-caprae*, *Picris echioides*, *Plantago* spp., *Polygonum punctatum*, *Potentilla anserina*, *Ranunculus californicus*, *Rumex* spp., *Rumex conglomeratus*, *Schoenoplectus americanus*, *Scirpus microcarpus*, *Stachys bullata*, *Stachys chamissonis*, and *Veronica americana*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	12.5	12 – 13	12.5	10 – 15
Regenerating or Shrubby Tree	0.2	0 – 0.4	1.5	1 – 2
Shrub	18.0	13 – 23	1.1	0.5 – 2
Herb	22.5	5 – 40	0.9	0 – 2

Local Environmental Description

Elevation: Mean 8 m, Range 7 – 8 m

Aspect: NW (1), SW (1)

Slope: Mean 2 degrees, Range 1 – 3 degrees

Macro Topography: Bottom (2)

Large Rock: Mean 0.5%, Range 0.0 – 1.0%

Small Rock: Mean 0.5%, Range 0.0 – 1.0%

Fines Cover: Mean 71.5%, Range 55.0 – 88.0%

Litter Cover: Mean 12.5%, Range 10.0 – 15%

Soil Texture (field assessed): Fine sand (1), Fine silty clay (1)

Geology (field or map data): Alluvium (1), Sandstone (1)

San Mateo County Watersheds: Ano Nuevo (1)

Salix laevigata / *Salix lasiolepis* Association
Salix gooddingii – *Salix laevigata* Woodland Alliance

Other Watersheds, Marin Co.: Lagunitas Creek (1)

Site Impacts

This association has low non-native plant cover (average 3.4%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Cakile maritima*, *Carpobrotus edulis*, *Ehrharta erecta*, *Festuca arundinacea*, *Foeniculum vulgare*, *Holcus lanatus*, *Oxalis pes-caprae*, *Picris echioides*, *Rubus armeniacus*, and *Rumex conglomeratus*.

Classification Comments

Since the number of surveys of this association in San Mateo County is low, data from nearby counties were included.

References: AECOM 2013, Buck-Diaz et al. 2012, Evens and San 2005, Keeler-Wolf and Evens 2006, Keeler-Wolf and Vaghti 2000, Klein and Evens 2005, Klein et al. 2007, Klein et al. 2015, Reyes et al. 2020a, Stillwater Sciences and URS 2007, VegCAMP 2015a

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=2; San Mateo County (n=1): SMAT0647

Marin County (n=1): MARIN054

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Alnus rubra</i>	100.0	12.3	1.6	0.2	3				Y
	<i>Salix laevigata</i>	50.0	48.4	6.0	12	12				Y
	<i>Salix spp.</i>	50.0	38.5	5.0	10	10				Y
	<i>Fraxinus latifolia</i>	50.0	0.8	0.1	0.2	0.2				Y
Regenerating or Shrubby Trees	<i>Fraxinus latifolia</i>	50.0	25.0	0.1	0.2	0.2				Y
	<i>Alnus rubra</i>	50.0	25.0	0.1	0.2	0.2				Y
Shrub	<i>Salix lasiolepis</i>	100.0	86.3	16.5	10	23		Y		Y
	<i>Rubus ursinus</i>	50.0	7.4	1.0	2	2				Y

Salix laevigata / *Salix lasiolepis* Association
Salix gooddingii – *Salix laevigata* Woodland Alliance

	<i>Sambucus racemosa</i>	50.0	3.7	0.5	1	1	Y
	<i>Lupinus arboreus</i>	50.0	0.7	0.1	0.2	0.2	Y
	<i>Baccharis salicifolia</i>	50.0	0.7	0.1	0.2	0.2	Y
	<i>Rubus spectabilis</i>	50.0	0.7	0.1	0.2	0.2	Y
	<i>Rubus armeniacus</i>	50.0	0.4	0.1	0.2	0.2	Y
Herb							
	<i>Urtica dioica</i>	100.0	0.8	0.2	0.2	0.2	Y
	<i>Juncus effusus</i>	100.0	0.8	0.2	0.2	0.2	Y
	<i>Stachys chamissonis</i>	50.0	14.8	6.0	12	12	Y
	<i>Polygonum punctatum</i>	50.0	14.8	6.0	12	12	Y
	<i>Scirpus microcarpus</i>	50.0	14.8	6.0	12	12	Y
	<i>Juncus arcticus</i>	50.0	11.4	2.0	4	4	Y
	<i>Schoenoplectus americanus</i>	50.0	11.4	2.0	4	4	Y
	<i>Cyperus spp.</i>	50.0	8.5	1.5	3	3	Y
	<i>Potentilla anserina</i>	50.0	5.7	1.0	2	2	Y
	<i>Marah fabaceus</i>	50.0	2.8	0.5	1	1	Y
	<i>Ehrharta erecta</i>	50.0	2.8	0.5	1	1	Y
	<i>Oenanthe sarmentosa</i>	50.0	1.2	0.5	1	1	Y
	<i>Rumex conglomeratus</i>	50.0	1.2	0.5	1	1	Y
	<i>Veronica americana</i>	50.0	1.2	0.5	1	1	Y
	<i>Equisetum spp.</i>	50.0	0.6	0.1	0.2	0.2	Y
	<i>Plantago spp.</i>	50.0	0.6	0.1	0.2	0.2	Y
	<i>Heracleum maximum</i>	50.0	0.6	0.1	0.2	0.2	Y
	<i>Cakile maritima</i>	50.0	0.6	0.1	0.2	0.2	Y
	<i>Foeniculum vulgare</i>	50.0	0.6	0.1	0.2	0.2	Y
	<i>Picris echioides</i>	50.0	0.6	0.1	0.2	0.2	Y
	<i>Festuca arundinacea</i>	50.0	0.6	0.1	0.2	0.2	Y
	<i>Stachys bullata</i>	50.0	0.6	0.1	0.2	0.2	Y
	<i>Oxalis pes-caprae</i>	50.0	0.6	0.1	0.2	0.2	Y
	<i>Carpobrotus edulis</i>	50.0	0.6	0.1	0.2	0.2	Y
	<i>Rumex spp.</i>	50.0	0.6	0.1	0.2	0.2	Y
	<i>Athyrium filix-femina</i>	50.0	0.2	0.1	0.2	0.2	Y
	<i>Ranunculus californicus</i>	50.0	0.2	0.1	0.2	0.2	Y
	<i>Equisetum arvense</i>	50.0	0.2	0.1	0.2	0.2	Y
	<i>Holcus lanatus</i>	50.0	0.2	0.1	0.2	0.2	Y
	<i>Epilobium ciliatum</i>	50.0	0.2	0.1	0.2	0.2	Y
	<i>Carex obnupta</i>	50.0	0.2	0.1	0.2	0.2	Y

***Salix lucida* ssp. *lasiandra* Forest & Woodland Alliance**



Common Name: Shining willow groves

NVC Alliance Code: A3748. *Salix lucida* Scrub Swamp Alliance

Statewide Description

Salix lucida is dominant or co-dominant in the tree or shrub canopy with *Acer macrophyllum*, *Alnus rhombifolia*, *Cornus sericea*, *Platanus racemosa*, *Populus fremontii*, *Populus trichocarpa*, *Quercus agrifolia*, *Salix* spp., and *Sambucus nigra*.

In California, *Salix lucida* stands appear to be limited to relatively moist coastal areas, permanently flooded swampy bottomlands, saturated montane meadows, or along low-gradient streams. Disturbances during winter floods modify stands; the timing of seed dispersal and spring flood patterns determine seedling success. There are two subspecies of *Salix lucida*: *S. lucida* ssp. *lasiandra*, which is usually a tree, and *S. lucida* ssp. *caudata*, a montane shrub. Only *Salix lucida* ssp. *lasiandra* is included in this alliance.

Local Vegetation Description

The Shining willow groves Alliance forms an open to intermittent tree canopy with a sparse to continuous shrub understory. *Salix lasiandra* is the dominant tree or regenerating layer. Commonly associated shrubs include *Rubus ursinus*, *Cornus sericea*, and *Toxicodendron diversilobum*, and commonly associated herbs include *Scrophularia californica*.

Salix lucida ssp. *lasiandra* Woodland Alliance

Local Membership Rule

Salix lucida ssp. *lasiandra* dominates in the overstory, sometimes with higher or similar cover by shrubs in the understory, such as *Rubus* spp. and *Salix lasiolepis*. Sometimes *Alnus rubra* may be co-dominant with *S. lucida*, and adjacent stands may be dominated by *Alnus* spp., *Quercus agrifolia* or conifers.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.2	0 – 1	7.5	5 – 10
Hardwood	27.2	2 – 75	10.3	2 – 20
Regenerating or Shrubby Tree	14.9	0 – 50.2	2.5	1 – 5
Shrub	37.6	0 – 85	3.7	0 – 10
Herb	22.5	1 – 75	0.7	0 – 2

Local Environmental Description

Elevation: Mean 71 m, Range 16 – 107 m

Aspect: Flat (3), NW (2)

Slope: Mean 2 degrees, Range 0 – 7 degrees

Macro Topography: Bottom (2), Lower 1/3 of slope (2), Bottom to Lower 1/3 of slope (1)

Large Rock: Mean 0.0%, Range 0.0 – 0.2%

Small Rock: Mean 0.1%, Range 0.0 – 0.4%

Fines Cover: Mean 24.0%, Range 1.0 – 70.0%

Litter Cover: Mean 71.6%, Range 26.0 – 94%

Soil Texture (field assessed): Coarse, loamy sand (1), Fine clay (1), Fine sandy clay (1), Medium to very fine, sandy loam (1), Not recorded (1)

Geology (field or map data): Mixed alluvium (2), Sandstone and other sedimentary (1), Franciscan melange (1), Alluvium (1), Granitic (generic) (1)

San Mateo County Watersheds: Palo Alto (2), San Mateo Bayside (2), Ano Nuevo (1), Half Moon Bay (1), San Francisco Coastal (1)

Site Impacts

This alliance has low non-native plant cover (average 17.0%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Conium maculatum* and *Raphanus sativus*.

Associations in San Mateo County

- *Salix lucida* ssp. *lasiandra*

Classification Comments

None.

References: Buck-Diaz et al. 2012, Keeler-Wolf et al. 2003a, Klein et al. 2015, Sproul et al. 2011

Global Rarity Rank: G4

State Rarity Rank: S3

Surveys Used for Description

Total: N=7; San Mateo County (n=7): GGNRA328, PGA10913, PGA753, SCLAR122, SMAT0105, SMAT0141, SMAT0249

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Salix lasiandra</i>	71.4	70.7	17.4	15	40				Y
	<i>Alnus rubra</i>	28.6	7.8	0.6	2	2				
	<i>Umbellularia californica</i>	28.6	4.7	0.2	0.2	1				
Regenerating or Shrubby Trees										
	<i>Salix lasiandra</i>	42.9	42.8	14.4	11	50				
Shrub	<i>Rubus ursinus</i>	85.7	27.5	14.3	0.2	30	Y			Y
	<i>Cornus sericea</i>	57.1	14.8	7.5	0.2	40				Y
	<i>Toxicodendron diversilobum</i>	57.1	6.4	2.9	0.2	15.2				Y
	<i>Salix lasiolepis</i>	42.9	18.8	7.2	0.2	30				
	<i>Ribes divaricatum</i>	42.9	4.3	1.5	0.2	5				
	<i>Sambucus racemosa</i>	28.6	6.0	2.9	5	15				
	<i>Salix exigua</i>	28.6	2.5	1.9	4	9				
Herb	<i>Scrophularia californica</i>	57.1	4.1	0.1	0.2	0.2				Y
	<i>Urtica dioica</i>	42.9	9.2	2.3	0.2	15				
	<i>Conium maculatum</i>	42.9	2.0	0.5	0.2	3				
	<i>Raphanus sativus</i>	28.6	3.9	2.9	0.2	20				
Non-Vascular										
	Lichen	42.9	26.2	0.2	0.2	1				
	Moss	42.9	16.7	0.1	0.2	0.2				

***Salix lucida* ssp. *lasiandra* Association**

Common Name: Shining willow Woodland

Alliance: *Salix lucida* ssp. *lasiandra* Forest & Woodland Alliance

Classification Comments

The association circumscription is the same as that of the alliance for the county. See above for detailed description.

References: Buck-Diaz et al. 2012, Keeler-Wolf et al. 2003a, Klein et al. 2015, Sproul et al. 2011

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Salix lasiandra</i>	71.4	70.7	17.4	15	40				Y
	<i>Alnus rubra</i>	28.6	7.8	0.6	2	2				
	<i>Umbellularia californica</i>	28.6	4.7	0.2	0.2	1				
Regenerating or Shrubby Trees										
	<i>Salix lasiandra</i>	42.9	42.8	14.4	11	50				
Shrub	<i>Rubus ursinus</i>	85.7	27.5	14.3	0.2	30				Y
	<i>Cornus sericea</i>	57.1	14.8	7.5	0.2	40				Y
	<i>Toxicodendron diversilobum</i>	57.1	6.4	2.9	0.2	15.2				Y
	<i>Salix lasiolepis</i>	42.9	18.8	7.2	0.2	30				
	<i>Ribes divaricatum</i>	42.9	4.3	1.5	0.2	5				
	<i>Sambucus racemosa</i>	28.6	6.0	2.9	5	15				
	<i>Salix exigua</i>	28.6	2.5	1.9	4	9				
Herb	<i>Scrophularia californica</i>	57.1	4.1	0.1	0.2	0.2				Y
	<i>Urtica dioica</i>	42.9	9.2	2.3	0.2	15				
	<i>Conium maculatum</i>	42.9	2.0	0.5	0.2	3				
	<i>Raphanus sativus</i>	28.6	3.9	2.9	0.2	20				
Non-Vascular	Lichen	42.9	26.2	0.2	0.2	1				
	Moss	42.9	16.7	0.1	0.2	0.2				

Salix lucida ssp. *lasiandra* Woodland Alliance

***Schinus (molle, terebinthifolius) – Myoporum laetum* Woodland Semi-Natural Alliance**



Common Name: Pepper tree or Myoporum groves

NVC Alliance Code: A3329. *Schinus molle* - *Schinus terebinthifolius* - *Myoporum laetum*
Ruderal Woodland Alliance

Statewide Description

Myoporum laetum, *Schinus molle*, or *Schinus terebinthifolius* is dominant in the tree canopy. DiTomaso and Healey (2007) considered these trees as invasive in California. These trees are evergreen with aromatic compound leaves. Birds disperse the colored fruits allowing seedlings to establish in wildland vegetation. The trees are common ornamentals that have escaped from cultivation. *Myoporum laetum* occurs in central and southern California, as an escaped ornamental to 10 m tall. *M. laetum*, the ngaio tree, has Cal-IPC rank of Moderate, and it is a native of New Zealand. It forms dense, single-species stands in coastal areas. It has particularly spread from campground plantings in state parks along the central and southern coast. It can sprout easily after fire when top-killed, and its purple fruits are attractive to birds, which disperse them (Kitz 2000b).

Local Vegetation Description

The Pepper tree or Myoporum Alliance forms an intermittent overstory canopy with an open shrub understory in the single sample available. The dominant tall shrub or small

tree is *Myoporum laetum*, with *Baccharis pilularis* and *Frangula californica* also present. Herbs include *Holcus lanatus*, *Achillea millefolium*, *Bromus hordeaceus*, *Geranium dissectum*, *Picris echioides*, and *Vulpia myuros*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	NA	no data	no data
Hardwood	0.0	NA	no data	no data
Regenerating or Shrubby Tree	0.0	NA	no data	no data
Shrub	40.0	NA	3.5	2 – 5
Herb	35.0	NA	0.3	0 – 0.5

Local Membership Rule

Myoporum laetum dominant in open to dense stands.

Local Environmental Description

Elevation: 19 m

Aspect: SW (1)

Slope: 1 degree

Macro Topography: Lower 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.2%

Fines Cover: 25.0%

Litter Cover: 72%

Soil Texture (field assessed): Medium to very fine, sandy loam (1)

Geology (field or map data): Sandstone (1)

San Mateo County Watersheds: Ano Nuevo (1)

Site Impacts

This alliance has greater cover of exotics than natives, non-native plant cover averages 91.2% relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Cirsium vulgare*, *Geranium dissectum*, *Holcus lanatus*, *Myoporum laetum*, *Parentucellia viscosa*, *Picris echioides*, *Raphanus sativus*, *Sonchus asper*, *Vicia sativa*, and *Vulpia myuros*.

Associations in San Mateo County

None determined

Classification Comments

The single survey was classified to the alliance level only.

References: Stillwater Sciences and URS 2007

Global Rarity Rank: GNA **State Rarity Rank:** SNA

Schinus (molle, terebinthifolius) – *Myoporum laetum* Woodland Semi-Natural Alliance

Surveys Used for Description

Total: N=1; San Mateo County (n=1): SMAT0100

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Myoporum laetum</i>	100.0	87.1	35.0	35	35	Y	Y		Y
	<i>Baccharis pilularis</i>	100.0	12.4	5.0	5	5	Y			Y
	<i>Frangula californica</i>	100.0	0.5	0.2	0.2	0.2	Y			Y
Herb	<i>Holcus lanatus</i>	100.0	38.2	15.0	15	15	Y		Y	Y
	<i>Picris echioides</i>	100.0	25.4	10.0	10	10	Y			Y
	<i>Bromus hordeaceus</i>	100.0	12.7	5.0	5	5	Y			Y
	<i>Vulpia myuros</i>	100.0	12.7	5.0	5	5	Y			Y
	<i>Achillea millefolium</i>	100.0	2.5	1.0	1	1	Y			Y
	<i>Geranium dissectum</i>	100.0	2.5	1.0	1	1	Y			Y
	<i>Raphanus sativus</i>	100.0	0.5	0.2	0.2	0.2	Y			Y
	<i>Rumex salicifolius</i>	100.0	0.5	0.2	0.2	0.2	Y			Y
	<i>Sonchus asper</i>	100.0	0.5	0.2	0.2	0.2	Y			Y
	<i>Vicia sativa</i>	100.0	0.5	0.2	0.2	0.2	Y			Y
	<i>Symphotrichum chilense</i>	100.0	0.5	0.2	0.2	0.2	Y			Y
	<i>Juncus patens</i>	100.0	0.5	0.2	0.2	0.2	Y			Y
	<i>Galium aparine</i>	100.0	0.5	0.2	0.2	0.2	Y			Y
	<i>Cirsium vulgare</i>	100.0	0.5	0.2	0.2	0.2	Y			Y
	<i>Carduus pycnocephalus</i>	100.0	0.5	0.2	0.2	0.2	Y			Y
	<i>Anagallis arvensis</i>	100.0	0.5	0.2	0.2	0.2	Y			Y
	<i>Medicago spp.</i>	100.0	0.5	0.2	0.2	0.2	Y			Y
<i>Parentucellia viscosa</i>	100.0	0.3	0.1	0.11	0.11	Y			Y	

***Sequoia sempervirens* Forest & Woodland Alliance**



Common Name: Redwood forest and woodland

NVC Alliance Code: A3403. *Sequoia sempervirens* Forest Alliance

Statewide Description

Sequoia sempervirens is dominant or co-dominant in the tree canopy with *Abies grandis*, *Acer macrophyllum*, *Alnus rubra*, *Arbutus menziesii*, *Chrysolepis chrysophylla*, *Notholithocarpus densiflorus*, *Picea sitchensis*, *Pseudotsuga menziesii*, *Tsuga heterophylla*, and *Umbellularia californica*.

Sequoia sempervirens occurs in moist coastal areas with heavy summer fog. Stands generally occur below 600 meters in elevation, from southern Oregon to the Santa Lucia Mountains in central California. Scattered stands also occur along streams, springs, seeps, and sheltered moist locations up to about 975 meters in elevation, where they usually occur as mixed hardwood forests (Sawyer 2006, 2007). *Sequoia sempervirens* is probably limited in its northern extent by freezing temperatures and in its southern extent by low winter rainfall (Lanner 1999).

Ecologists differentiate forests on alluvial streamside terraces, where *S. sempervirens* is usually the dominant canopy tree, from those in upland settings, where *S. sempervirens* shares the canopy with other conifers and with hardwood trees (NatureServe 2007a). However, these differences are best understood when the associations are placed in three geographic regions (Sawyer et al. 2000b). *Tsuga heterophylla* plays an important role in the northern forest region, and it is absent from

Sequoia sempervirens Woodland Alliance

the other two regions, where *Notholithocarpus densiflorus* plays an important role. Additionally, redwood genetics in the southern forest region differs from that in the other regions (Sawyer et al. 2000a, b). Precipitation varies significantly between northern and southern regions with fog-drip playing an increasingly important role in the southern portion of the range (Olsen et al. 1990).

Local Vegetation Description

The Redwood forest and woodland Alliance forms an open to continuous tree canopy with a sparse to continuous shrub understory. The dominant tree is *Sequoia sempervirens*, and *Notholithocarpus densiflorus* and *Arbutus menziesii* are characteristic or often present. Commonly associated shrubs include *Vaccinium ovatum*, and commonly associated herbs include *Polystichum munitum*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	46.5	0 – 95	41.6	15 – 100
Hardwood	31.1	0 – 90	21.7	5 – 50
Regenerating or Shrubby Tree	3.5	0 – 40.0	5.0	0.5 – 20
Shrub	10.3	0.0 – 70.0	2.1	0 – 5
Herb	6.9	0 – 40	0.3	0 – 1

Local Membership Rule

Sequoia sempervirens dominates, co-dominates, or characterizes (rarely with as little as 5% cover) stands near streams, along all slopes and aspects, or on ridges. Associated trees include *Acer macrophyllum*, *Notholithocarpus densiflorus*, *Pseudotsuga menziesii*, *Torreya californica*, and *Umbellularia californica*, which are typically sub- to co-dominant but may occasionally exceed *Sequoia* in cover. *Vaccinium ovatum*, *Oxalis oregana*, and *Woodwardia fimbriata* may intermix in the understory.

Local Environmental Description

Elevation: Mean 363 m, Range 77 – 658 m

Aspect: NW (4), SE (4), Variable (4), NE (3), SW (2), Flat (1)

Slope: Mean 22 degrees, Range 0 – 63 degrees

Macro Topography: Middle 1/3 of slope (5), Upper 1/3 of slope (4), Bottom to Lower 1/3 of slope (4), Upper 1/3 of slope to Ridgetop (2), Lower 1/3 of slope (2), Ridge top (1)

Large Rock: Mean 2.9%, Range 0.0 – 25.0%

Small Rock: Mean 1.5%, Range 0.0 – 15.0%

Fines Cover: Mean 7.2%, Range 0.0 – 35.0%

Litter Cover: Mean 84.2%, Range 28.0 – 100%

Soil Texture (field assessed): Medium to very fine, sandy loam (4), Moderately fine clay loam (3), Moderately coarse, sandy loam (2), Moderately fine silty clay loam (2), Medium to very fine, loamy sand (2), Medium sand (1), Medium loam (1), Coarse, loamy sand (1), Sand, (class unknown) (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Shale and other sedimentary (41), Sandstone (3), Mixed

sedimentary (2), Sedimentary (type unknown) (2), Siltstone (1), Franciscan melange (1), Metamorphic (type unknown) (1), Mixed alluvium (1), Mixed metamorphic (1), Sandy alluvium (most alluvial fans and washes) (1)

San Mateo County Watersheds: Palo Alto (25), San Mateo Bayside (15), Pescadero Creek (7), Ano Nuevo (3), San Gregorio Creek (2), Tunitas Creek (2)

Site Impacts

This alliance has very low non-native plant cover (average 0.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Epipactis helleborine*.

Associations in San Mateo County

- *Sequoia sempervirens* – *Acer macrophyllum* – *Umbellularia californica*
- *Sequoia sempervirens* – *Arbutus menziesii* / *Vaccinium ovatum*
- *Sequoia sempervirens* – *Chrysolepis chrysophylla* / *Arctostaphylos glandulosa*
- *Sequoia sempervirens* – *Notholithocarpus densiflorus* / *Vaccinium ovatum*
- *Sequoia sempervirens* – *Pseudotsuga menziesii* – *Notholithocarpus densiflorus*
- *Sequoia sempervirens* – *Pseudotsuga menziesii* – *Umbellularia californica*
- *Sequoia sempervirens* – *Umbellularia californica*
- *Sequoia sempervirens* / (*Pteridium aquilinum*) – *Woodwardia fimbriata*
- *Sequoia sempervirens* / *Polystichum munitum*

Classification Comments

None.

References: Borchert et al. 1988, Buck and Evens 2010, Evens and Kentner 2006, Keeler-Wolf et al.

2003a, Klein et al. 2015, Lenihan 1990, Taylor 1982

Global Rarity Rank: G3

State Rarity Rank: S3

Surveys Used for Description

Total: N=60; San Mateo County (n=60): GGNRA332, PGA1044, PGA1048, PGA1856, PGA1857, PGA1860, PGA1861, PGA1862, PGA1864, PGA1865, PGA1871, PGA1874, PGA1875, PGA1878, PGA768, PGA772, PGA777, PGA783, PGA784, PGA789, PGA790A, PGA794, PGA795, PGA800, PGA804, PGA806A, PGA806B, PGA806C, PGA808, PGA808A, PGA808B, PGA808C, PGA808D, PGA808E, PGA809, PGA812, PGA813, PGA815, PGA818, PGA822, PGA822A, PGA830, PWDFR02A, SCLAR128, SMAT0022, SMAT0048, SMAT0049, SMAT0082, SMAT0187, SMAT0188, SMAT0233, SMAT0235, SMAT0275, SMAT0277, SMAT0278, SMAT0281, SMAT0284, SMAT0290, SMAT0662, SMAT0685

Alliance Stand Table

Sequoia sempervirens Woodland Alliance

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Sequoia sempervirens</i>	98.3	53.8	43.6	1	95	Y	Y		Y
	<i>Notholithocarpus densiflorus</i>	86.7	27.7	24.1	0.2	80	Y			Y
	<i>Arbutus menziesii</i>	65.0	5.7	4.8	0.2	20				Y
	<i>Pseudotsuga menziesii</i>	46.7	6.2	3.9	0.2	30				
	<i>Umbellularia californica</i>	28.3	3.7	3.1	0.2	50				
Regenerating or Shrubby Trees	<i>Sequoia sempervirens</i>	23.3	6.2	1.0	0.2	40				
	<i>Notholithocarpus densiflorus</i>	20.0	11.0	1.4	0.2	23				
Shrub	<i>Vaccinium ovatum</i>	53.3	40.8	5.7	0.2	40				Y
	<i>Toxicodendron diversilobum</i>	33.3	10.3	0.6	0.2	10				
	<i>Lonicera hispidula</i>	33.3	4.8	0.5	0.2	15				
	<i>Rubus ursinus</i>	25.0	2.8	0.3	0.2	10				
Herb	<i>Polystichum munitum</i>	60.0	26.4	2.4	0.2	30				Y
	<i>Dryopteris arguta</i>	40.0	11.7	1.0	0.2	15				
	<i>Epipactis helleborine</i>	30.0	9.0	0.1	0.2	1				
Non-Vascular	Moss	23.3	17.6	0.2	0.2	3				

***Sequoia sempervirens* – *Acer macrophyllum* – *Umbellularia californica* Association**

Common Name: Redwood – Bigleaf Maple – California Bay Woodland

Alliance: *Sequoia sempervirens* Forest & Woodland Alliance

Local Vegetation Description

The Redwood – Bigleaf Maple – California Bay Association forms an intermittent to continuous tree canopy with a sparse to open shrub understory. The dominant tree is *Sequoia sempervirens*, and *Acer macrophyllum*, *Umbellularia californica*, and *Notholithocarpus densiflorus* are characteristic or often present. Commonly associated shrubs include *Corylus cornuta*, and commonly associated herbs include *Polystichum munitum*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	60.0	45 – 75	42.5	35 – 50
Hardwood	8.5	7 – 10	15.0	10 – 20
Regenerating or Shrubby Tree	2.0	1.2 – 2.8	5.5	2 – 10
Shrub	1.1	0.2 – 2.0	2.1	0.5 – 5
Herb	29.5	11 – 48	0.5	0 – 1

Local Environmental Description

Elevation: Mean 162 m, Range 141 – 183 m

Aspect: NW (1), Variable (1)

Slope: Mean 35 degrees, Range 25 – 45 degrees

Macro Topography: Bottom to Lower 1/3 of slope (1), Lower 1/3 of slope (1)

Large Rock: Mean 1.1%, Range 0.2 – 2.0%

Small Rock: Mean 3.1%, Range 1.2 – 5.0%

Fines Cover: Mean 11.5%, Range 1.0 – 22.0%

Litter Cover: Mean 80.5%, Range 70.0 – 91%

Soil Texture (field assessed): Medium loam (1), Moderately fine clay loam (1)

Geology (field or map data): Mixed alluvium (1), Mixed metamorphic (1)

San Mateo County Watersheds: San Gregorio Creek (1), Tunitas Creek (1)

Site Impacts

This association has very low non-native plant cover (average 0.2%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Hedera helix*.

Classification Comments

Sequoia sempervirens – *Acer macrophyllum* – *Umbellularia californica* Association
Sequoia sempervirens Woodland Alliance

None.

References: Borchert et al. 1988, Evens and Kentner 2006, Klein et al. 2015

Global Rarity Rank: G3 **State Rarity Rank:** S3 **State Rare:** Y

Surveys Used for Description

Total: N=2; San Mateo County (n=2): SMAT0049, SMAT0284

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Sequoia sempervirens</i>	100.0	87.4	52.5	45	60		Y		Y
	<i>Acer macrophyllum</i>	100.0	6.6	4.0	3	5				Y
	<i>Notholithocarpus densiflorus</i>	100.0	2.7	1.5	1	2				Y
	<i>Alnus rubra</i>	50.0	1.5	1.0	2	2				Y
	<i>Alnus rhombifolia</i>	50.0	1.0	0.5	1	1				Y
	<i>Umbellularia californica</i>	50.0	1.0	0.5	1	1				Y
	Regenerating or Shrubby Trees	<i>Sequoia sempervirens</i>	100.0	47.6	1.2	0.2	2.2			Y
<i>Acer macrophyllum</i>		100.0	11.9	0.2	0.2	0.2				Y
<i>Notholithocarpus densiflorus</i>		100.0	11.9	0.2	0.2	0.2				Y
<i>Umbellularia californica</i>		50.0	16.7	0.2	0.4	0.4				Y
<i>Alnus rhombifolia</i>		50.0	8.3	0.1	0.2	0.2				Y
<i>Alnus rubra</i>		50.0	3.6	0.1	0.2	0.2				Y
Shrub	<i>Rubus ursinus</i>	100.0	8.6	0.2	0.2	0.2				Y
	<i>Rubus parviflorus</i>	100.0	8.6	0.2	0.2	0.2				Y
	<i>Corylus cornuta</i>	50.0	25.0	0.5	1	1				Y
	<i>Euonymus occidentalis</i> var. <i>occidentalis</i>	50.0	17.9	0.5	1	1				Y
	<i>Sambucus racemosa</i>	50.0	17.9	0.5	1	1				Y
	<i>Hedera helix</i>	50.0	5.0	0.1	0.2	0.2				Y

Sequoia sempervirens – *Acer macrophyllum* – *Umbellularia californica* Association
Sequoia sempervirens Woodland Alliance

	<i>Symphoricarpos mollis</i>	50.0	5.0	0.1	0.2	0.2		Y
	<i>Cornus sericea</i>	50.0	5.0	0.1	0.2	0.2		Y
	<i>Vaccinium ovatum</i>	50.0	3.6	0.1	0.2	0.2		Y
	<i>Holodiscus discolor</i>	50.0	3.6	0.1	0.2	0.2		Y
Herb								
	<i>Athyrium filix-femina</i>	100.0	35.7	15.5	1	30	Y	Y
	<i>Polystichum munitum</i>	100.0	24.7	8.5	2	15		Y
	<i>Oxalis oregana</i>	100.0	3.0	1.1	0.2	2		Y
	<i>Adiantum aleuticum</i>	100.0	1.1	0.2	0.2	0.2		Y
	<i>Prosartes hookeri</i>	100.0	1.1	0.2	0.2	0.2		Y
	<i>Stachys bullata</i>	100.0	1.1	0.2	0.2	0.2		Y
	<i>Urtica dioica</i>	100.0	1.1	0.2	0.2	0.2		Y
	<i>Tiarella trifoliata</i>	50.0	13.6	1.5	3	3		Y
	<i>Woodwardia fimbriata</i>	50.0	4.5	0.5	1	1		Y
	<i>Viola glabella</i>	50.0	4.5	0.5	1	1		Y
	<i>Equisetum telmateia</i>	50.0	0.9	0.1	0.2	0.2		Y
	<i>Adiantum jordanii</i>	50.0	0.9	0.1	0.2	0.2		Y
	<i>Prunella vulgaris</i>	50.0	0.9	0.1	0.2	0.2		Y
	<i>Asarum caudatum</i>	50.0	0.9	0.1	0.2	0.2		Y
	<i>Petasites frigidus</i>	50.0	0.9	0.1	0.2	0.2		Y
	<i>Maianthemum racemosum</i>	50.0	0.9	0.1	0.2	0.2		Y
	<i>Trillium ovatum</i>	50.0	0.9	0.1	0.2	0.2		Y
	<i>Galium aparine</i>	50.0	0.9	0.1	0.2	0.2		Y
	<i>Viola ocellata</i>	50.0	0.9	0.1	0.2	0.2		Y
	<i>Polypodium glycyrrhiza</i>	50.0	0.9	0.1	0.2	0.2		Y
	<i>Solanum spp.</i>	50.0	0.2	0.1	0.2	0.2		Y
	<i>Heuchera micrantha</i>	50.0	0.2	0.1	0.2	0.2		Y
Non-Vascular								
	Moss	50.0	25.0	0.1	0.2	0.2		Y
	Lichen	50.0	25.0	0.1	0.2	0.2		Y

***Sequoia sempervirens* – *Arbutus menziesii* / *Vaccinium ovatum* Association**

Common Name: Redwood – Madrone / Black Huckleberry Woodland

Alliance: *Sequoia sempervirens* Forest & Woodland Alliance

Local Vegetation Description

The Redwood – Madrone / Black Huckleberry Association forms a continuous tree canopy with a sparse to open shrub understory. The dominant tree is *Sequoia sempervirens*, and *Arbutus menziesii* and *Notholithocarpus densiflorus* are characteristic or often present. Commonly associated shrubs include *Vaccinium ovatum* and *Lonicera hispidula*, and commonly associated herbs include *Iris douglasiana*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	88.3	80 – 95	42.5	35 – 50
Hardwood	6.3	2 – 15	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.8	0.0 – 2.0	no data	no data
Herb	0.0	0 – 0	no data	no data

Local Environmental Description

Elevation: Mean 356 m, Range 207 – 505 m

Aspect: no data

Slope: no data

Macro Topography: no data

Large Rock: No data

Small Rock: No data

Fines Cover: No data

Litter Cover: No data

Soil Texture (field assessed): no data

Geology (field or map data): Shale and other sedimentary (4)

San Mateo County Watersheds: Palo Alto (3), San Mateo Bayside (1)

Site Impacts

This association has very low non-native plant cover (average 0.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Genista monspessulana*.

Classification Comments

Sequoia sempervirens – *Arbutus menziesii* / *Vaccinium ovatum* Association
Sequoia sempervirens Woodland Alliance

This association has been revised to include the previously accepted *Sequoia sempervirens* – *Arbutus menziesii* Association (Lenihan 1990).

References: Evens and Kentner 2006

Global Rarity Rank: G3 **State Rarity Rank:** S3 **State Rare:** Y

Surveys Used for Description

Total: N=4; San Mateo County (n=4): PGA1048, PGA1874, PGA772, PGA815

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Sequoia sempervirens</i>	100.0	91.2	87.0	80	95		Y		Y
	<i>Arbutus menziesii</i>	100.0	6.5	6.3	2	15				Y
	<i>Pseudotsuga menziesii</i>	75.0	1.8	1.8	1	5				Y
	<i>Notholithocarpus densiflorus</i>	25.0	0.5	0.5	2	2				
Regenerating or Shrubby Trees	<i>Sequoia sempervirens</i>	100.0	47.6	1.2	0.2	2.2			Y	Y
	<i>Acer macrophyllum</i>	100.0	11.9	0.2	0.2	0.2				Y
	<i>Notholithocarpus densiflorus</i>	100.0	11.9	0.2	0.2	0.2				Y
Shrub	<i>Vaccinium ovatum</i>	50.0	47.7	0.8	1	2				Y
	<i>Lepechinia calycina</i>	25.0	12.5	0.1	0.2	0.2				
	<i>Toxicodendron diversilobum</i>	25.0	12.5	0.1	0.2	0.2				
	<i>Lonicera hispidula</i>	25.0	2.3	0.1	0.2	0.2				
Herb	<i>Dryopteris arguta</i>	25.0	25.0	0.1	0.2	0.2				
	<i>Epipactis helleborine</i>	25.0	25.0	0.1	0.2	0.2				

***Sequoia sempervirens* – *Chrysolepis chrysophylla* / *Arctostaphylos glandulosa* Association**

Common Name: Redwood – Chinquapin / Eastwood Manzanita Woodland

Alliance: *Sequoia sempervirens* Forest & Woodland Alliance

Local Vegetation Description

The Redwood – Chinquapin / Eastwood Manzanita Association forms an open tree canopy with an intermittent shrub understory in the single sample available. The dominant tree is *Sequoia sempervirens*, and *Chrysolepis chrysophylla* var. *chrysophylla* and *Quercus agrifolia* are characteristically present.

Commonly associated shrubs include *Arctostaphylos crustacea* and *Vaccinium ovatum*, and commonly associated herbs include *Pteridium aquilinum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	20.0	NA	no data	no data
Hardwood	25.0	NA	no data	no data
Regenerating or Shrubby Tree	25.0	NA	no data	no data
Shrub	50.0	NA	3.5	2 – 5
Herb	15.0	NA	0.3	0 – 0.5

Local Environmental Description

Elevation: 222 m

Aspect: no data

Slope: no data

Macro Topography: no data

Large Rock: No data

Small Rock: No data

Fines Cover: No data

Litter Cover: No data

Soil Texture (field assessed): no data

Geology (field or map data): Shale and other sedimentary (1)

San Mateo County Watersheds: San Mateo Bayside (1)

Site Impacts

This association has very low non-native plant cover (average 0.0%) relative to native cover. No non-native species were recorded by the surveyors.

Classification Comments

Arctostaphylos crustacea is found in similar settings to *A. glandulosa* south of the *Sequoia sempervirens* – *Chrysolepis chrysophylla* / *Arctostaphylos glandulosa* Association *Sequoia sempervirens* Woodland Alliance

Golden Gate (M. Vasey, pers.comm. 2021).

References: Evens and Kentner 2006

Global Rarity Rank: G2 **State Rarity Rank:** S2? **State Rare:** Y

Surveys Used for Description

Total: N=1; **San Mateo County (n=1):** PGA783

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Sequoia sempervirens</i>	100.0	98.0	20.0	20	20		Y		Y
	<i>Quercus agrifolia</i>	100.0	1.0	0.2	0.2	0.2				Y
	<i>Chrysolepis chrysophylla</i> var. <i>chrysophylla</i>	100.0	1.0	0.2	0.2	0.2				Y
Regenerating or Shrubby Trees	<i>Quercus wislizeni</i>	100.0	100.0	25.0	25	25		Y		Y
Shrub	<i>Arctostaphylos crustacea</i>	100.0	73.1	50.0	50	50		Y		Y
	<i>Vaccinium ovatum</i>	100.0	26.3	18.0	18	18				Y
	<i>Heteromeles arbutifolia</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Lonicera hispidula</i>	100.0	0.3	0.2	0.2	0.2				Y
Herb	<i>Pteridium aquilinum</i>	100.0	100.0	15.0	15	15		Y		Y

***Sequoia sempervirens* – *Notholithocarpus densiflorus* / *Vaccinium ovatum* Association**

Common Name: Redwood – Tanoak / Black Huckleberry Woodland

Alliance: *Sequoia sempervirens* Forest & Woodland Alliance

Local Vegetation Description

The Redwood – Tanoak / Black Huckleberry Association forms a continuous tree canopy with a sparse to intermittent shrub understory. The co-dominant trees are *Notholithocarpus densiflorus* and *Sequoia sempervirens*, and *Arbutus menziesii* is often present. Commonly associated shrubs include *Vaccinium ovatum*, and commonly associated herbs include *Polystichum munitum*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	44.8	10 – 80	41.7	20 – 50
Hardwood	44.6	10 – 90	27.8	15 – 50
Regenerating or Shrubby Tree	3.1	0 – 27.2	5.5	1 – 10
Shrub	11.7	0.0 – 62.5	2.4	0 – 5
Herb	2.6	0 – 15	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 460 m, Range 122 – 623 m

Aspect: NE (2), SE (1), SW (1)

Slope: Mean 12 degrees, Range 6 – 20 degrees

Macro Topography: Lower 1/3 of slope (1), Upper 1/3 of slope to Ridgetop (1), Middle 1/3 of slope (1), Upper 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: Mean 0.1%, Range 0.0 – 0.2%

Fines Cover: Mean 5.0%, Range 5.0 – 5.0%

Litter Cover: Mean 92.8%, Range 90.0 – 100%

Soil Texture (field assessed): Moderately fine silty clay loam (2), Coarse, loamy sand (1), Medium sand (1)

Geology (field or map data): Shale and other sedimentary (21), Sandstone (1)

San Mateo County Watersheds: Palo Alto (15), San Mateo Bayside (6), Pescadero Creek (1)

Site Impacts

This association has very low non-native plant cover (average 0.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Epipactis helleborine*.

Classification Comments

None.

References: Evens and Kentner 2006, Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: G3 **State Rarity Rank:** S3 **State Rare:** Y

Surveys Used for Description

Total: N=26; San Mateo County (n=26): GGNRA332, PGA1856, PGA1857, PGA1871, PGA777, PGA784, PGA790A, PGA794, PGA800, PGA804, PGA806A, PGA806B, PGA806C, PGA808, PGA808A, PGA808B, PGA808E, PGA809, PGA812, PGA813, PGA818, PGA822, PWDFR02A, SMAT0022, SMAT0082, SMAT0277

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Sequoia sempervirens</i>	100.0	49.1	45.5	15	80			Y	Y
	<i>Notholithocarpus densiflorus</i>	96.2	41.8	40.4	5	80			Y	Y
	<i>Arbutus menziesii</i>	57.7	5.8	5.6	0.2	20				Y
	<i>Pseudotsuga menziesii</i>	26.9	0.9	0.8	0.2	10				
Shrub	<i>Vaccinium ovatum</i>	53.8	52.5	9.4	2	40				Y
	<i>Toxicodendron diversilobum</i>	23.1	5.3	0.2	0.2	3				
Herb	<i>Polystichum munitum</i>	50.0	30.3	1.9	0.2	15				Y
	<i>Epipactis helleborine</i>	30.8	14.2	0.1	0.2	1				
	<i>Dryopteris arguta</i>	30.8	7.3	0.3	0.2	2				

***Sequoia sempervirens* – *Pseudotsuga menziesii* – *Notholithocarpus densiflorus* Association**

Common Name: Redwood – Douglas-fir – Tanoak Woodland

Alliance: *Sequoia sempervirens* Forest & Woodland Alliance

Local Vegetation Description

The Redwood – Douglas-fir – Tanoak Association forms an intermittent to continuous tree canopy with a sparse to open shrub understory. The dominant tree is *Sequoia sempervirens*, and *Notholithocarpus densiflorus*, *Pseudotsuga menziesii*, and *Arbutus menziesii* are characteristic or often present. Commonly associated shrubs include *Vaccinium ovatum*, *Lonicera hispidula*, and *Rubus ursinus*, and commonly associated herbs include *Polystichum munitum* and *Epipactis helleborine*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	49.6	25 – 75	43.8	20 – 100
Hardwood	24.4	8 – 60	19.1	10 – 35
Regenerating or Shrubby Tree	2.3	0 – 11.6	3.2	0.5 – 5
Shrub	4.9	0.0 – 20.0	1.6	0.5 – 5
Herb	7.6	0 – 40	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 417 m, Range 139 – 658 m

Aspect: Variable (2), SE (2), NW (2), SW (1), NE (1)

Slope: Mean 19 degrees, Range 5 – 40 degrees

Macro Topography: Middle 1/3 of slope (3), Upper 1/3 of slope (3), Ridge top (1),
Upper 1/3 of slope to Ridgetop (1)

Large Rock: Mean 0.8%, Range 0.0 – 5.2%

Small Rock: Mean 0.7%, Range 0.0 – 4.0%

Fines Cover: Mean 3.5%, Range 0.0 – 10.0%

Litter Cover: Mean 90.9%, Range 72.0 – 97%

Soil Texture (field assessed): Medium to very fine, sandy loam (3), Medium to very fine, loamy sand (2), Moderately coarse, sandy loam (1), Moderately fine clay loam (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Shale and other sedimentary (6), Mixed sedimentary (2), Metamorphic (type unknown) (1), Sandstone (1), Sedimentary (type unknown) (1), Siltstone (1)

San Mateo County Watersheds: Ano Nuevo (3), Palo Alto (3), Pescadero Creek (3), San Gregorio Creek (1), San Mateo Bayside (1), Tunitas Creek (1)

Sequoia sempervirens – *Pseudotsuga menziesii* – *Notholithocarpus densiflorus* Association
Sequoia sempervirens Woodland Alliance

Site Impacts

This association has very low non-native plant cover (average 0.2%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Epipactis helleborine*.

Classification Comments

None.

References: Klein et al. 2015

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=13; San Mateo County (n=13): PGA789, PGA808C, PGA808D, PGA822A, PGA830, SMAT0048, SMAT0233, SMAT0235, SMAT0278, SMAT0281, SMAT0290, SMAT0662, SMAT0685

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Sequoia sempervirens</i>	100.0	46.0	38.1	15	83			Y	Y
	<i>Notholithocarpus densiflorus</i>	100.0	26.5	23.2	3	55				Y
	<i>Pseudotsuga menziesii</i>	100.0	19.9	14.3	2	30				Y
	<i>Arbutus menziesii</i>	69.2	4.0	3.7	0.2	15				Y
Regenerating or Shrubby Trees	<i>Notholithocarpus densiflorus</i>	46.2	26.5	1.5	0.2	10.2				
	<i>Sequoia sempervirens</i>	46.2	8.7	0.4	0.2	3				
	<i>Pseudotsuga menziesii</i>	46.2	7.7	0.3	0.2	2				
Shrub	<i>Vaccinium ovatum</i>	84.6	61.1	5.8	0.2	20		Y		Y
	<i>Lonicera hispidula</i>	61.5	8.5	0.1	0.2	0.2				Y
	<i>Rubus ursinus</i>	53.8	3.3	0.2	0.2	2				Y
	<i>Toxicodendron diversilobum</i>	23.1	1.6	0.1	0.2	1				
Herb										

Sequoia sempervirens – *Pseudotsuga menziesii* – *Notholithocarpus densiflorus* Association
Sequoia sempervirens Woodland Alliance

<i>Polystichum munitum</i>	84.6	28.9	1.8	0.2	8	Y
<i>Epipactis helleborine</i>	61.5	5.4	0.1	0.2	0.2	Y
<i>Oxalis oregana</i>	38.5	17.5	4.8	0.2	35	
<i>Dryopteris arguta</i>	38.5	4.9	0.1	0.2	0.2	
<i>Stachys bullata</i>	30.8	1.1	0.1	0.2	0.2	
<i>Trillium ovatum</i>	30.8	0.6	0.1	0.2	1	
<i>Cardamine californica</i>	30.8	0.4	0.1	0.2	0.2	
<i>Iris spp.</i>	23.1	2.3	0.0	0.2	0.2	
<i>Whipplea modesta</i>	23.1	2.2	0.0	0.2	0.2	
<i>Polygala californica</i>	23.1	1.6	0.0	0.2	0.2	
<i>Bromus vulgaris</i>	23.1	1.4	0.0	0.2	0.2	
<i>Galium californicum</i>	23.1	1.0	0.0	0.2	0.2	
<i>Viola sempervirens</i>	23.1	1.0	0.0	0.2	0.2	
<i>Pteridium aquilinum</i>	23.1	0.8	0.0	0.2	0.2	
Non-Vascular						
Moss	46.2	25.0	0.1	0.2	0.2	
Lichen	38.5	19.2	0.1	0.2	0.4	

***Sequoia sempervirens* – *Pseudotsuga menziesii* – *Umbellularia californica* Association**

Common Name: Redwood – Douglas-fir – California Bay Woodland

Alliance: *Sequoia sempervirens* Forest & Woodland Alliance

Local Vegetation Description

The Redwood – Douglas-fir – California Bay Association forms a continuous tree canopy with an open shrub understory in the single sample available. The dominant tree is *Sequoia sempervirens*, and *Pseudotsuga menziesii*, *Umbellularia californica*, and *Notholithocarpus densiflorus* are characteristic or often present. Commonly associated shrubs include *Toxicodendron diversilobum* and *Vaccinium ovatum*, and commonly associated herbs include *Dryopteris arguta* and *Polystichum munitum*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	75.0	NA	42.5	35 – 50
Hardwood	15.0	NA	no data	no data
Regenerating or Shrubby Tree	0.0	NA	no data	no data
Shrub	15.0	NA	no data	no data
Herb	20.0	NA	0.3	0 – 0.5

Local Environmental Description

Elevation: 270 m

Aspect: no data

Slope: no data

Macro Topography: no data

Large Rock: No data

Small Rock:No data

Fines Cover: No data

Litter Cover: No data

Soil Texture (field assessed): no data

Geology (field or map data): Shale and other sedimentary (1)

San Mateo County Watersheds: Palo Alto (1)

Site Impacts

This association has very low non-native plant cover (average 0.0%) relative to native cover. No non- native species were recorded by the surveyors.

Classification Comments

None.

References: Evens and Kentner 2006, Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=1; San Mateo County (n=1): PGA1878

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Sequoia sempervirens</i>	100.0	60.0	60.0	60	60		Y		Y
	<i>Pseudotsuga menziesii</i>	100.0	15.0	15.0	15	15				Y
	<i>Arbutus menziesii</i>	100.0	10.0	10.0	10	10				Y
	<i>Umbellularia californica</i>	100.0	10.0	10.0	10	10				Y
	<i>Notholithocarpus densiflorus</i>	100.0	5.0	5.0	5	5				Y
Shrub	<i>Frangula californica</i>	100.0	98.7	15.0	15	15		Y		Y
	<i>Symphoricarpos spp.</i>	100.0	1.3	0.2	0.2	0.2				Y
Herb	<i>Dryopteris arguta</i>	100.0	74.3	15.0	15	15		Y		Y
	<i>Clinopodium douglasii</i>	100.0	24.8	5.0	5	5				Y
	<i>Iris spp.</i>	100.0	1.0	0.2	0.2	0.2				Y

***Sequoia sempervirens* – *Umbellularia californica* Association**

Common Name: Redwood – California Bay Woodland

Alliance: *Sequoia sempervirens* Forest & Woodland Alliance

Local Vegetation Description

The Redwood – California Bay Association forms an open to continuous tree canopy with an open to continuous shrub understory. The dominant tree is *Sequoia sempervirens*, and *Arbutus menziesii*, *Notholithocarpus densiflorus*, and *Umbellularia californica* are characteristic or often present. Commonly associated shrubs include *Toxicodendron diversilobum* and *Lonicera hispidula*, and commonly associated herbs include *Dryopteris arguta* and *Polystichum munitum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	32.8	15 – 55	37.5	20 – 50
Hardwood	36.7	0 – 70	25.0	15 – 35
Regenerating or Shrubby Tree	4.3	0 – 26.0	17.5	15 – 20
Shrub	18.2	2.0 – 70.0	1.4	0 – 5
Herb	9.8	2 – 15	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 198 m, Range 78 – 420 m

Aspect: NW (1)

Slope: Mean 20 degrees, Range 20 – 20 degrees

Macro Topography: Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: 2.0%

Litter Cover: 98%

Soil Texture (field assessed): Moderately fine clay loam (1)

Geology (field or map data): Shale and other sedimentary (4), Franciscan melange (1)

San Mateo County Watersheds: San Mateo Bayside (3), Palo Alto (2)

Site Impacts

This association has very low non-native plant cover (average 0.0%) relative to native cover. No non- native species were recorded by the surveyors.

Classification Comments

Sequoia sempervirens – *Umbellularia californica* Association
Sequoia sempervirens Woodland Alliance

None.

References: Evens and Kentner 2006, Klein et al. 2015

Global Rarity Rank: G3 **State Rarity Rank:** S3 **State Rare:** Y

Surveys Used for Description

Total: N=6; San Mateo County (n=6): PGA1862, PGA1864, PGA1865, PGA768, PGA795, SCLAR128

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Sequoia sempervirens</i>	100.0	52.3	32.8	15	55		Y		Y
	<i>Umbellularia californica</i>	83.3	27.2	23.3	10	50				Y
	<i>Arbutus menziesii</i>	83.3	10.2	7.5	5	15				Y
	<i>Notholithocarpus densiflorus</i>	83.3	8.9	6.7	0.2	20				Y
	<i>Quercus agrifolia</i>	33.3	1.2	1.0	1	5				
Shrub	<i>Toxicodendron diversilobum</i>	100.0	46.2	1.7	0.2	5			Y	Y
	<i>Lonicera hispidula</i>	66.7	11.6	2.6	0.2	15				Y
	<i>Symphoricarpos mollis</i>	33.3	9.5	0.7	0.2	4				
	<i>Heteromeles arbutifolia</i>	33.3	6.8	0.1	0.2	0.2				
	<i>Frangula californica</i>	33.3	4.6	0.8	2	3				
	<i>Rubus ursinus</i>	33.3	4.2	0.1	0.2	0.2				
Herb	<i>Dryopteris arguta</i>	100.0	36.8	3.8	0.2	10			Y	Y
	<i>Polystichum munitum</i>	66.7	34.5	3.2	0.2	10				Y
	<i>Adiantum jordanii</i>	33.3	5.8	0.1	0.2	0.2				
	<i>Pentagramma triangularis</i>	33.3	0.5	0.1	0.2	0.2				

***Sequoia sempervirens* / (*Pteridium aquilinum*) – *Woodwardia fimbriata* Association**

Common Name: Redwood / Bracken – Chain Fern / Streamsides Woodland

Alliance: *Sequoia sempervirens* Forest & Woodland Alliance

Local Vegetation Description

The Redwood / Bracken – Chain Fern / Streamsides Association forms an open to continuous tree canopy with an open shrub understory. The dominant tree is *Sequoia sempervirens*, and *Notholithocarpus densiflorus*, *Pseudotsuga menziesii*, and *Acer macrophyllum* are often present. Commonly associated herbs include *Polystichum munitum* and *Woodwardia fimbriata*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	20.0	0 – 55	30.0	15 – 50
Hardwood	7.3	2 – 15	15.8	5 – 35
Regenerating or Shrubby Tree	15.7	1.8 – 40.0	4.8	2 – 10
Shrub	10.7	2.0 – 15.0	2.8	1 – 5
Herb	16.7	5 – 35	0.6	0 – 1

Local Environmental Description

Elevation: Mean 115 m, Range 77 – 152 m

Aspect: Flat (1), SE (1), Variable (1)

Slope: Mean 34 degrees, Range 0 – 63 degrees

Macro Topography: Bottom to Lower 1/3 of slope (3)

Large Rock: Mean 14.5%, Range 0.6 – 25.0%

Small Rock: Mean 5.4%, Range 0.0 – 15.0%

Fines Cover: Mean 18.3%, Range 10.0 – 35.0%

Litter Cover: Mean 52.7%, Range 28.0 – 70%

Soil Texture (field assessed): Medium to very fine, sandy loam (1), Moderately coarse, sandy loam (1), Sand, (class unknown) (1)

Geology (field or map data): Sandstone (1), Sandy alluvium (most alluvial fans and washes) (1), Sedimentary (type unknown) (1)

San Mateo County Watersheds: Pescadero Creek (3)

Site Impacts

This association has very low non-native plant cover (average 0.2%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Cirsium vulgare*, *Epipactis helleborine*, and *Genista monspessulana*.

Sequoia sempervirens / (*Pteridium aquilinum*) – *Woodwardia fimbriata* Association
Sequoia sempervirens Woodland Alliance

Classification Comments

None.

References: Borchert et al. 1988, Evens and Kentner 2006, Klein et al. 2015

Global Rarity Rank: G3 **State Rarity Rank:** S3 **State Rare:** Y

Surveys Used for Description

Total: N=3; San Mateo County (n=3): SMAT0187, SMAT0188, SMAT0275

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Notholithocarpus densiflorus</i>	66.7	40.4	8.3	10	15				Y
	<i>Sequoia sempervirens</i>	66.7	30.1	18.7	1	55				Y
	<i>Pseudotsuga menziesii</i>	66.7	20.9	1.7	0.2	5				Y
	<i>Acer macrophyllum</i>	66.7	4.3	0.4	0.2	1				Y
	<i>Arbutus menziesii</i>	33.3	4.2	0.3	1	1				
	<i>Umbellularia californica</i>	33.3	0.1	0.1	0.2	0.2				
Regenerating or Shrubby Trees										
	<i>Sequoia sempervirens</i>	66.7	40.7	13.5	0.4	40				Y
	<i>Notholithocarpus densiflorus</i>	33.3	22.2	0.4	1.2	1.2				
	<i>Acer macrophyllum</i>	33.3	18.5	1.0	3	3				
	<i>Pseudotsuga menziesii</i>	33.3	12.3	0.7	2	2				
	<i>Alnus rubra</i>	33.3	3.7	0.1	0.2	0.2				
	<i>Umbellularia californica</i>	33.3	1.2	0.1	0.2	0.2				
	<i>Quercus wislizeni</i>	33.3	1.2	0.1	0.2	0.2				
Shrub										
	<i>Vaccinium ovatum</i>	66.7	19.2	0.7	0.2	2				Y

Sequoia sempervirens / (*Pteridium aquilinum*) – *Woodwardia fimbriata* Association
Sequoia sempervirens Woodland Alliance

	<i>Rubus ursinus</i>	66.7	9.9	0.4	0.2	1		Y
	<i>Rubus parviflorus</i>	66.7	8.7	0.7	0.2	2		Y
	<i>Corylus cornuta</i>	33.3	20.8	1.7	5	5		
	<i>Toxicodendron diversilobum</i>	33.3	17.0	1.7	5	5		
	<i>Salix lasiolepis</i>	33.3	12.5	1.0	3	3		
	<i>Ceanothus thyrsiflorus</i>	33.3	6.8	0.7	2	2		
	<i>Genista monspessulana</i>	33.3	1.9	0.1	0.2	0.2		
	<i>Rhododendron occidentale</i>	33.3	1.9	0.1	0.2	0.2		
	<i>Symphoricarpos albus</i>	33.3	0.7	0.1	0.2	0.2		
	<i>Lonicera hispidula</i>	33.3	0.7	0.1	0.2	0.2		
	<i>Vaccinium ovatum</i>	66.7	19.2	0.7	0.2	2		
Herb								
	<i>Woodwardia fimbriata</i>	100.0	42.3	12.7	0.2	30	Y	Y
	<i>Polystichum munitum</i>	100.0	5.2	0.5	0.2	1		Y
	<i>Equisetum telmateia</i>	66.7	19.4	3.0	1	8		Y
	<i>Pteridium aquilinum</i>	66.7	2.8	0.4	0.2	1		Y
	<i>Scirpus microcarpus</i>	66.7	1.3	0.1	0.2	0.2		Y
	<i>Oxalis oregana</i>	66.7	1.1	0.1	0.2	0.2		Y
	<i>Athyrium filix-femina</i>	33.3	4.6	0.3	1	1		
	<i>Carex spp.</i>	33.3	4.6	0.3	1	1		
	<i>Boykinia occidentalis</i>	33.3	4.4	1.7	5	5		
	<i>Trillium ovatum</i>	33.3	0.9	0.1	0.2	0.2		
	<i>Epipactis helleborine</i>	33.3	0.9	0.1	0.2	0.2		
	<i>Calamagrostis rubescens</i>	33.3	0.9	0.1	0.2	0.2		
	<i>Iris spp.</i>	33.3	0.9	0.1	0.2	0.2		
	<i>Tiarella trifoliata</i>	33.3	0.9	0.1	0.2	0.2		
	<i>Hierochloe occidentalis</i>	33.3	0.9	0.1	0.2	0.2		
	<i>Aralia californica</i>	33.3	0.9	0.1	0.2	0.2		
	<i>Whipplea modesta</i>	33.3	0.9	0.1	0.2	0.2		
	<i>Viola sempervirens</i>	33.3	0.9	0.1	0.2	0.2		
	<i>Stachys ajugoides</i>	33.3	0.9	0.1	0.2	0.2		
	<i>Prosartes hookeri</i>	33.3	0.9	0.1	0.2	0.2		
	<i>Maianthemum stellatum</i>	33.3	0.9	0.1	0.2	0.2		
	<i>Stachys bullata</i>	33.3	0.9	0.3	1	1		
	<i>Carex nudata</i>	33.3	0.4	0.1	0.2	0.2		
	<i>Cirsium vulgare</i>	33.3	0.4	0.1	0.2	0.2		
	<i>Juncus effusus</i>	33.3	0.4	0.1	0.2	0.2		
	<i>Pentagramma triangularis</i>	33.3	0.2	0.1	0.2	0.2		
	<i>Clinopodium douglasii</i>	33.3	0.2	0.1	0.2	0.2		
	<i>Osmorhiza berteroi</i>	33.3	0.2	0.1	0.2	0.2		
	<i>Adiantum aleuticum</i>	33.3	0.2	0.1	0.2	0.2		

Sequoia sempervirens / (*Pteridium aquilinum*) – *Woodwardia fimbriata* Association
Sequoia sempervirens Woodland Alliance

	<i>Iris douglasiana</i>	33.3	0.2	0.1	0.2	0.2	
	<i>Fragaria vesca</i>	33.3	0.2	0.1	0.2	0.2	
Non-Vascular							
	Moss	66.7	61.1	1.7	2	3	Y
	Liverwort	33.3	2.8	0.1	0.2	0.2	
	Lichen	33.3	2.8	0.1	0.2	0.2	

***Sequoia sempervirens* / *Polystichum munitum* Association**

Common Name: Redwood / Sword Fern Woodland

Alliance: *Sequoia sempervirens* Forest & Woodland Alliance

Local Vegetation Description

The Redwood / Sword Fern Association forms an intermittent to continuous tree canopy with a sparse to open shrub understory. The dominant tree is *Sequoia sempervirens*, and *Umbellularia californica* is often present. Commonly associated herbs include *Polystichum munitum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	73.0	30 – 90	35.0	20 – 50
Hardwood	6.2	0 – 25	17.5	15 – 20
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.8	0.0 – 2.0	no data	no data
Herb	17.0	0.2 – 40	0.5	0 – 1

Local Environmental Description

Elevation: Mean 239 m, Range 88 – 331 m

Aspect: NE (3)

Slope: Mean 26 degrees, Range 10 – 36 degrees

Macro Topography: Upper 1/3 of slope (2)

Large Rock: 0.0%

Small Rock: 0.2%

Fines Cover: Mean 2.7%, Range 1.0 – 6.0%

Litter Cover: 92%

Soil Texture (field assessed): Moderately fine clay loam (1), Moderately fine silty clay loam (1)

Geology (field or map data): Sandstone and other sedimentary (3), Shale and other sedimentary (2), Alluvium (1)

San Mateo County Watersheds: San Mateo Bayside (2)

Other Watersheds, Marin Co.: Bolinas (2), Novato (2)

Site Impacts

This association has very low non-native plant cover (average 0.0%) relative to native cover. No non-native species were recorded by the surveyors.

Classification Comments

Sequoia sempervirens / *Polystichum munitum* Association
Sequoia sempervirens Woodland Alliance

Since the number of surveys of this association in San Mateo County is low, data from nearby counties were included.

References: Buck and Evens 2010, Lenihan 1990, Taylor 1982

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=6; San Mateo County (n=2): PGA1044, PGA1860

Marin County (n=4): MOSD0152, MOSD0153, PGA1612, SFANR06

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Sequoia sempervirens</i>	100.0	90.9	77.4	30	99.306	Y			Y
	<i>Umbellularia californica</i>	50.0	0.9	0.5	0.2	2				Y
	<i>Notholithocarpus densiflorus</i>	33.3	4.9	2.5	0.2	15				
	<i>Arbutus menziesii</i>	33.3	2.0	1.2	2	5				
	<i>Pseudotsuga menziesii</i>	33.3	1.3	1.3	1	6.9444				
	Shrub	<i>Frangula californica</i>	33.3	25.0	0.1	0.2	0.2			
Herb	<i>Polystichum munitum</i>	100.0	76.8	16.9	0.2	30		Y		Y
	<i>Maianthemum racemosum</i>	33.3	5.9	0.1	0.2	0.2				
	<i>Dryopteris arguta</i>	33.3	4.2	1.7	0.2	10				

***Umbellularia californica* Forest & Woodland Alliance**



Common Name: California bay forest and woodland

NVC Alliance Code: A3346 or A3750. *Quercus agrifolia* Woodland Alliance or *Platanus racemosa* - *Quercus agrifolia* - *Juglans californica* Riparian Woodland Alliance

Statewide Description

Umbellularia californica is dominant or co-dominant in the tree or tall shrub canopy with *Acer macrophyllum*, *Aesculus californica*, *Alnus rhombifolia*, *Alnus rubra*, *Arbutus menziesii*, *Corylus cornuta*, *Juglans californica*, *Notholithocarpus densiflorus*, *Pinus sabiniana*, *Platanus racemosa*, *Pseudotsuga menziesii*, *Quercus agrifolia*, *Quercus chrysolepis*, *Quercus wislizeni*, and *Sequoia sempervirens*.

In many cases, *Umbellularia californica* is the only tree species in older stands with few shrubs and herbs present (McBride 1974). Stands occur near the coast and inland in both mesic and riparian settings, usually in a patchwork with stands of other evergreen forest or chaparral alliances. Coastal stands have characteristically wind-pruned trees or shrubs, and both coastal and inland stands typically have dense, clonally sprouted plants. The stands may be shrubby, as on ultramafic soils such as in the western Klamath Mountains, or they may be trees within a larger matrix of chaparral, as in central and southern California. Historically productive stands were cleared for agriculture and residential development (Stein 1990b).

Local Vegetation Description

The California bay forest and woodland Alliance forms an open to continuous tree canopy with an open to intermittent shrub understory. The dominant tree is *Umbellularia californica*, and *Quercus agrifolia* are characteristic or often present. Commonly associated shrubs include *Toxicodendron diversilobum*, *Rubus ursinus*, *Frangula californica*, *Heteromeles arbutifolia*, and *Lonicera hispidula*, and commonly associated herbs include *Dryopteris arguta* and *Polystichum munitum*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	2.3	0 – 15	3.5	2 – 5
Hardwood	56.6	15 – 80	17.5	10 – 35
Regenerating or Shrubby Tree	4.3	0 – 23.0	4.0	1 – 10
Shrub	36.3	3.0 – 60.0	2.3	0.5 – 5
Herb	24.7	2 – 50	0.3	0 – 0.5

Local Membership Rule

Umbellularia californica is either dominant or co-dominant with *Quercus agrifolia* in open to dense woodlands. Found in a variety of upland settings, such as coastal bluffs, inland ridges, steep north-facing slopes, rocky outcrops and post-fire landscapes. If *U. californica* is found in a riparian setting, key to *Acer macrophyllum* – *Alnus rubra* Alliance. If *U. californica* is co-dominant with *Arbutus*, *Acer*, or *Pinus sabiniana* on serpentine, or *Pseudotsuga menziesii*, *Quercus chrysolepis*, *Q. lobata*, *Q. kelloggii*, or *Sequoia*, key to one of these other hardwood or conifer alliances instead.

Local Environmental Description

Elevation: Mean 155 m, Range 88 – 267 m

Aspect: Variable (2), NE (2), NW (1), SE (1)

Slope: Mean 27 degrees, Range 1 – 43 degrees

Macro Topography: Lower 1/3 of slope (2), Middle 1/3 of slope (2), Upper 1/3 of slope (1), Lower to Middle 1/3 of slope (1)

Large Rock: Mean 0.2%, Range 0.0 – 1.2%

Small Rock: Mean 4.9%, Range 0.0 – 20.0%

Fines Cover: Mean 29.8%, Range 8.0 – 53.0%

Litter Cover: Mean 63.4%, Range 40.0 – 88%

Soil Texture (field assessed): Coarse, loamy sand (3), Unknown (1), Medium loam (1), Moderately coarse, sandy loam (1)

Geology (field or map data): Franciscan melange (6), Sandstone and other sedimentary (4), Volcanic and metavolcanic rocks (1), Greenstone (1), Sandstone (1), Sandstone, shale, and conglomerate (1), Ultramafic rocks, mostly serpentine (1), Granitic (generic) (1)

San Mateo County Watersheds: San Mateo Bayside (10), Half Moon Bay (3), Palo Alto (2), Pescadero Creek (1)

Site Impacts

This alliance has low non-native plant cover (average 4.3%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Carduus pycnocephalus* and *Epipactis helleborine*.

Associations in San Mateo County

- *Umbellularia californica*
- *Umbellularia californica* – *Quercus agrifolia* / *Toxicodendron diversilobum*
- *Umbellularia californica* / *Polystichum munitum*

Classification Comments

None.

References: Buck and Evens 2010, Campbell 1980, Evens and Kentner 2006, Fiedler and Leidy 1987, Jimerson et al. 1996, Keeler-Wolf et al. 2003a, Klein et al. 2007, Klein et al. 2015

Global Rarity Rank: G4

State Rarity Rank: S3

Surveys Used for Description

Total: N=16; San Mateo County (n=16): GGNRA344, GGNRA354, PGA1009, PGA1016, PGA12489, PGA1859, PGA722, PGA748, PGA757, PGA997, PWMEF01A, SCLAR127, SMAT0060, SMAT0075, SMAT0253, TOKA064

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Umbellularia californica</i>	100.0	62.1	37.0	4	75	Y	Y		Y
	<i>Quercus agrifolia</i>	81.3	26.2	14.2	0.2	35	Y			Y
	<i>Pseudotsuga menziesii</i>	25.0	4.2	1.8	0.2	15				
	<i>Aesculus californica</i>	25.0	4.2	1.6	1	12				
Regenerating or Shrubby Trees	<i>Umbellularia californica</i>	37.5	23.4	3.1	0.2	18				
	<i>Quercus agrifolia</i>	31.3	3.8	0.6	0.2	5				
Shrub	<i>Toxicodendron diversilobum</i>	93.8	41.3	19.1	0.2	60	Y		Y	Y
	<i>Rubus ursinus</i>	81.3	11.0	4.1	0.2	20	Y			Y
	<i>Umbellularia californica</i> Woodland Alliance									

	<i>Lonicera hispidula</i>	68.8	3.3	1.5	0.2	10		Y
	<i>Frangula californica</i>	50.0	16.9	7.5	0.2	40		Y
	<i>Heteromeles arbutifolia</i>	50.0	3.4	2.0	0.2	15		Y
	<i>Prunus ilicifolia</i>	31.3	4.7	1.8	1	20		
	<i>Holodiscus discolor</i>	31.3	3.2	0.5	0.2	3		
	<i>Corylus cornuta</i>	25.0	3.0	1.9	0.2	15		
	<i>Baccharis pilularis</i>	25.0	0.8	0.5	0.2	5		
	<i>Diplacus aurantiacus</i>	25.0	0.6	0.3	0.2	3		
Herb								
	<i>Dryopteris arguta</i>	75.0	17.7	5.3	0.2	30	Y	Y
	<i>Polystichum munitum</i>	56.3	24.9	7.9	0.2	40		Y
	<i>Sanicula crassicaulis</i>	43.8	2.3	0.2	0.2	2		
	<i>Clinopodium douglasii</i>	37.5	2.3	0.4	0.2	4		
	<i>Stachys ajugoides</i>	31.3	3.5	0.9	0.2	10		
	<i>Pentagramma triangularis</i>	31.3	1.4	0.2	0.2	2		
	<i>Scrophularia californica</i>	31.3	0.4	0.1	0.2	1		
	<i>Claytonia perfoliata</i>	31.3	0.6	0.1	0.2	0.2		
	<i>Heracleum maximum</i>	25.0	2.6	1.7	0.2	26		
	<i>Carduus pycnocephalus</i>	25.0	0.5	0.3	0.2	3.846		
						2		
	<i>Marah fabaceus</i>	25.0	0.9	0.2	0.2	3		
	<i>Galium aparine</i>	25.0	0.4	0.2	0.2	2		
	<i>Epipactis helleborine</i>	25.0	0.6	0.1	0.2	1		
	<i>Iris douglasiana</i>	25.0	0.7	0.1	0.2	1		

***Umbellularia californica* Association**

Common Name: California Bay Woodland

Alliance: *Umbellularia californica* Forest & Woodland Alliance

Local Vegetation Description

The California Bay Association forms a continuous tree canopy with an open shrub understory. The dominant tree is *Umbellularia californica*. Commonly associated shrubs include *Toxicodendron diversilobum* and *Lonicera hispidula*, and commonly associated herbs include *Pentagramma triangularis* and *Polystichum munitum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	76.0	75 – 77	22.5	15 – 35
Regenerating or Shrubby Tree	8.2	0.2 – 16.2	3.5	2 – 5
Shrub	18.0	16 – 20	1.1	0.5 – 2
Herb	3.5	2 – 5	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 135 m, Range 109 – 161 m

Aspect: NE (1), SE (1)

Slope: Mean 3 degrees, Range 1 – 5 degrees

Macro Topography: Lower 1/3 of slope (1), Lower to Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: Mean 0.5%, Range 0.0 – 1.0%

Fines Cover: Mean 12.5%, Range 10.0 – 15.0%

Litter Cover: Mean 82.5%, Range 78.0 – 87%

Soil Texture (field assessed): Moderately fine clay loam (1)

Geology (field or map data): Franciscan melange (1), Metamorphic (type unknown) (1)

San Mateo County Watersheds: San Mateo Bayside (1)

Site Impacts

This association has very low non-native plant cover (average 0.0%) relative to native cover. No non-native species were recorded by the surveyors.

Classification Comments

Since the number of surveys of this association in San Mateo County is low, data from nearby counties were included.

References: Campbell 1980, Evens and Kentner 2006

Global Rarity Rank: G3

State Rarity Rank: S3

State Rare: Y

Surveys Used for Description

Total: N=2; San Mateo County (n=1): SMAT0060

Santa Clara County (n=1): SCLAR115

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Umbellularia californica</i>	100.0	98.6	76.0	75	77		Y		Y
	<i>Aesculus californica</i>	50.0	0.7	0.5	1	1				Y
	<i>Quercus agrifolia</i>	50.0	0.6	0.5	1	1				Y
	<i>Acer macrophyllum</i>	50.0	0.1	0.1	0.2	0.2				Y
Regenerating or Shrubby Trees										
	<i>Umbellularia californica</i>	100.0	99.4	8.1	0.2	16		Y		Y
	<i>Quercus agrifolia</i>	50.0	0.6	0.1	0.2	0.2				Y
Shrub										
	<i>Rubus ursinus</i>	100.0	48.7	8.1	0.2	16			Y	Y
	<i>Frangula californica</i>	50.0	37.1	7.5	15	15				Y
	<i>Toxicodendron diversilobum</i>	50.0	12.4	2.5	5	5				Y
	<i>Holodiscus discolor</i>	50.0	0.6	0.1	0.2	0.2				Y
	<i>Symphoricarpos mollis</i>	50.0	0.6	0.1	0.2	0.2				Y
	<i>Rosa spithamea</i>	50.0	0.6	0.1	0.2	0.2				Y
Herb										
	<i>Dryopteris arguta</i>	100.0	50.5	2.6	0.2	5		Y		Y
	<i>Prosartes hookeri</i>	100.0	6.0	0.2	0.2	0.2				Y
	<i>Polystichum munitum</i>	50.0	20.8	0.5	1	1				Y
	<i>Iris douglasiana</i>	50.0	4.2	0.1	0.2	0.2				Y
	<i>Stachys spp.</i>	50.0	4.2	0.1	0.2	0.2				Y
	<i>Trillium spp.</i>	50.0	4.2	0.1	0.2	0.2				Y
	<i>Cynoglossum grande</i>	50.0	4.2	0.1	0.2	0.2				Y
	<i>Sanicula crassicaulis</i>	50.0	4.2	0.1	0.2	0.2				Y
	<i>Bromus laevipes</i>	50.0	1.9	0.1	0.2	0.2				Y
Non-Vascular										
	Moss	50.0	50.0	0.1	0.2	0.2				Y

***Umbellularia californica* – *Quercus agrifolia* / *Toxicodendron diversilobum* Association**

Common Name: California Bay – Coast Live Oak / Poison Oak Woodland

Alliance: *Umbellularia californica* Forest & Woodland Alliance

Local Vegetation Description

The California Bay – Coast Live Oak / Poison Oak Association forms an open to continuous tree canopy with an open to intermittent shrub understory. The dominant tree is *Umbellularia californica* and *Quercus agrifolia* is co-dominant. Commonly associated shrubs include *Toxicodendron diversilobum*, *Rubus ursinus*, *Heteromeles arbutifolia*, and *Lonicera hispidula*, and commonly associated herbs include *Dryopteris arguta*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	1.4	0 – 12	3.5	2 – 5
Hardwood	54.3	15 – 80	14.2	10 – 20
Regenerating or Shrubby Tree	4.7	0 – 23	4.2	1 – 10
Shrub	38.0	3 – 60	2.4	0.5 – 5
Herb	22.3	2 – 50	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 165 m, Range 88 – 267 m

Aspect: Variable (2), NE (1), NW (1), SE (1)

Slope: Mean 32 degrees, Range 24 – 43 degrees

Macro Topography: Middle 1/3 of slope (2), Lower 1/3 of slope (1), Lower to Middle 1/3 of slope (1), Upper 1/3 of slope (1)

Large Rock: Mean 0.3%, Range 0.0 – 1.2%

Small Rock: Mean 5.6%, Range 0.0 – 20%

Fines Cover: Mean 33.4%, Range 8 – 53%

Litter Cover: Mean 60.9%, Range 40 – 88%

Soil Texture (field assessed): Coarse, loamy sand (3), Medium loam (1), Moderately coarse, sandy loam (1)

Geology (field or map data): Franciscan melange (3), Sandstone and other sedimentary (3), Sandstone, shale, and conglomerate (1), Volcanic and metavolcanic rocks (1), Sandstone (1), Granitic (generic) (1), Greenstone (1), Ultramafic rocks, mostly serpentine (1)

San Mateo County Watersheds: San Mateo Bayside (7), Half Moon Bay (2), Palo Alto (2), Pescadero Creek (1)

Site Impacts

Umbellularia californica – *Quercus agrifolia* / *Toxicodendron diversilobum* Association
Umbellularia californica Woodland Alliance

This association has low non-native plant cover (average 5.5%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Carduus pycnocephalus* and *Epipactis helleborine*.

Classification Comments

This association newly merges the pre-existing associations of *Umbellularia californica* – *Quercus agrifolia* / *Toxicodendron diversilobum* (*Corylus cornuta*) (Keeler-Wolf et al. 2003a) and *Umbellularia californica* – *Quercus agrifolia* (Evens and Kentner 2006).

References: Evens and Kentner 2006, Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=12; San Mateo County (n=12): GGNRA344, GGNRA354, PGA1009, PGA1016, PGA1859, PGA722, PGA748, PGA997, SCLAR127, SMAT0075, SMAT0253, TOKA064

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Umbellularia californica</i>	100.0	52.0	31.8	4	55		Y		Y
	<i>Quercus agrifolia</i>	100.0	34.9	18.9	3	35			Y	Y
	<i>Aesculus californica</i>	25.0	5.4	2.1	3	12				
Regenerating or Shrubby Trees	<i>Umbellularia californica</i>	41.7	23.0	2.8	0.2	18				
	<i>Quercus agrifolia</i>	33.3	4.9	0.7	0.2	5				
	<i>Aesculus californica</i>	25.0	12.3	0.7	0.2	5				
Shrub	<i>Toxicodendron diversilobum</i>	100.0	39.3	20.9	0.2	60			Y	Y
	<i>Rubus ursinus</i>	83.3	13.1	5.0	0.2	20				Y
	<i>Lonicera hispidula</i>	75.0	2.9	1.3	0.2	10				Y
	<i>Heteromeles arbutifolia</i>	50.0	4.3	2.6	0.2	15				Y
	<i>Holodiscus discolor</i>	41.7	4.2	0.7	0.2	3				
	<i>Frangula californica</i>	33.3	11.9	7.3	3	40				
	<i>Prunus ilicifolia</i>	33.3	6.1	2.3	1	20				

Umbellularia californica – *Quercus agrifolia* / *Toxicodendron diversilobum* Association
Umbellularia californica Woodland Alliance

	<i>Diplacus aurantiacus</i>	33.3	0.8	0.4	0.2	3	
	<i>Corylus cornuta</i>	25.0	4.0	2.5	0.2	15	
	<i>Baccharis pilularis</i>	25.0	0.9	0.6	0.2	5	
Herb							
	<i>Dryopteris arguta</i>	66.7	16.3	5.4	1	30	Y
	<i>Polystichum munitum</i>	41.7	17.6	5.9	0.2	40	
	<i>Clinopodium douglasii</i>	41.7	3.0	0.6	0.2	4	
	<i>Heracleum maximum</i>	33.3	3.5	2.3	0.2	26	
	<i>Sanicula crassicaulis</i>	33.3	2.2	0.2	0.2	2	
	<i>Pentagramma triangularis</i>	33.3	1.8	0.3	0.2	2	
	<i>Claytonia perfoliata</i>	33.3	0.7	0.1	0.2	0.2	
	<i>Scrophularia californica</i>	33.3	0.4	0.1	0.2	1	
	<i>Stachys bullata</i>	25.0	6.5	3.8	1	30	
	<i>Elymus californicus</i>	25.0	3.3	1.3	0.2	15	
	<i>Bromus carinatus</i>	25.0	2.1	0.5	0.2	6	
	<i>Marah fabaceus</i>	25.0	1.1	0.3	0.2	3	
	<i>Epipactis helleborine</i>	25.0	0.7	0.1	0.2	1	
	<i>Carduus pycnocephalus</i>	25.0	0.5	0.4	0.2	3.8462	
	<i>Vicia spp.</i>	25.0	0.2	0.2	0.2	1.9231	

Umbellularia californica / Polystichum munitum Association

Common Name: California Laurel / Western Swordfern Forest Woodland

Alliance: *Umbellularia californica* Forest & Woodland Alliance

Local Vegetation Description

The California Laurel / Western Swordfern Forest Association forms an open to continuous tree canopy with an open to intermittent shrub understory. The dominant tree is *Umbellularia californica*. Commonly associated shrubs include *Corylus cornuta*, *Rubus ursinus*, and *Toxicodendron diversilobum*, and commonly associated herbs include *Polystichum munitum* and *Stachys ajugoides*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	7.5	0 – 15	no data	no data
Hardwood	57.5	40 – 75	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	34.3	11.0 – 52.0	no data	no data
Herb	46.5	45 – 48	no data	no data

Local Environmental Description

Elevation: Mean 131 m, Range 97 – 151 m

Aspect: no data

Slope: no data

Macro Topography: no data

Large Rock: 0.0%

Small Rock: 5.0%

Fines Cover: 35%

Litter Cover: 55%

Soil Texture (field assessed): no data

Geology (field or map data): Franciscan melange (2), Sandstone and other sedimentary (1)

San Mateo County Watersheds: San Mateo Bayside (2), Half Moon Bay (1)

Site Impacts

This association has very low non-native plant cover (average 0.8%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Erechtites minimus*.

Classification Comments

Umbellularia californica – *Quercus agrifolia* / *Toxicodendron diversilobum* Association
Umbellularia californica Woodland Alliance

None.

References: Buck and Evens 2010, Evens and Kentner 2006, Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=3; San Mateo County (n=3): PGA12489, PGA757, PWMEF01A

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Umbellularia californica</i>	100.0	90.3	45.0	20	75		Y		Y
	<i>Pseudotsuga menziesii</i>	66.7	9.4	5.1	0.2	15				Y
	<i>Quercus agrifolia</i>	33.3	0.3	0.1	0.2	0.2				
Shrub	<i>Frangula californica</i>	100.0	17.8	5.4	0.2	15				Y
	<i>Toxicodendron diversilobum</i>	66.7	54.8	16.7	10	40				Y
	<i>Rubus ursinus</i>	66.7	6.1	1.7	0.2	5				Y
	<i>Lonicera hispidula</i>	66.7	5.8	2.7	0.2	8				Y
	<i>Heteromeles arbutifolia</i>	66.7	1.2	0.4	0.2	1				Y
	<i>Sambucus racemosa</i>	33.3	11.0	3.3	10	10				
	<i>Prunus ilicifolia</i>	33.3	0.7	0.3	1	1				
	<i>Baccharis pilularis</i>	33.3	0.6	0.1	0.2	0.2				
	<i>Lepechinia calycina</i>	33.3	0.6	0.1	0.2	0.2				
	<i>Rosa gymnocarpa</i>	33.3	0.6	0.1	0.2	0.2				
	<i>Symphoricarpos mollis</i>	33.3	0.6	0.1	0.2	0.2				
	<i>Corylus cornuta</i>	33.3	0.2	0.1	0.2	0.2				
	Shrub (>.5m)	33.3	0.1	0.1	0.2	0.2				
Herb	<i>Polystichum munitum</i>	100.0	48.8	18.4	0.2	35			Y	Y
	<i>Dryopteris arguta</i>	100.0	26.5	6.7	0.2	10				Y
	<i>Stachys ajugoides</i>	100.0	14.6	4.7	1	10				Y
	<i>Galium aparine</i>	66.7	0.5	0.1	0.2	0.2				Y
	<i>Sanicula crassicaulis</i>	66.7	0.5	0.1	0.2	0.2				Y
	<i>Osmorhiza berteroi</i>	33.3	0.4	0.1	0.2	0.2				
	<i>Nemophila pedunculata</i>	33.3	0.4	0.1	0.2	0.2				
<i>Melica subulata</i>	33.3	0.4	0.1	0.2	0.2					

Umbellularia californica – *Quercus agrifolia* / *Toxicodendron diversilobum* Association
Umbellularia californica Woodland Alliance

<i>Maianthemum stellatum</i>	33.3	0.4	0.1	0.2	0.2
<i>Marah fabaceus</i>	33.3	0.4	0.1	0.2	0.2
<i>Iris douglasiana</i>	33.3	0.4	0.1	0.2	0.2
<i>Hirschfeldia incana</i>	33.3	0.4	0.1	0.2	0.2
<i>Galium californicum</i>	33.3	0.4	0.1	0.2	0.2
<i>Bromus laevipes</i>	33.3	0.4	0.1	0.2	0.2
<i>Sanicula laciniata</i>	33.3	0.4	0.1	0.2	0.2
<i>Scrophularia californica</i>	33.3	0.4	0.1	0.2	0.2
<i>Sonchus asper</i>	33.3	0.4	0.1	0.2	0.2
<i>Torilis nodosa</i>	33.3	0.4	0.1	0.2	0.2
<i>Trientalis borealis</i> ssp. <i>latifolia</i>	33.3	0.4	0.1	0.2	0.2
<i>Woodsia oregana</i>	33.3	0.4	0.1	0.2	0.2
<i>Elymus glaucus</i>	33.3	0.4	0.1	0.2	0.2
<i>Epipactis helleborine</i>	33.3	0.4	0.1	0.2	0.2
<i>Calystegia</i> spp.	33.3	0.4	0.1	0.2	0.2
<i>Carduus pycnocephalus</i>	33.3	0.4	0.1	0.2	0.2
<i>Chlorogalum</i> <i>pomeridianum</i>	33.3	0.4	0.1	0.2	0.2
<i>Cirsium vulgare</i>	33.3	0.4	0.1	0.2	0.2
<i>Clinopodium douglasii</i>	33.3	0.4	0.1	0.2	0.2
<i>Claytonia perfoliata</i>	33.3	0.4	0.1	0.2	0.2
<i>Pentagramma</i> <i>triangularis</i>	33.3	0.4	0.1	0.2	0.2
<i>Trillium ovatum</i>	33.3	0.2	0.1	0.2	0.2
Forb (herbaceous, not grass nor grasslike)	33.3	0.2	0.1	0.2	0.2

SHRUB-OVERSTORY VEGETATION

Acacia spp. – *Grevillea* spp. – *Leptospermum laevigatum* Shrubland Provisional Semi-Natural Alliance



Common Name: Australian wattle - Grevillea - Tea tree ruderal patches

NVC Alliance Code: N/A.

Statewide Description

Acacia species belong to the family Fabaceae and are known for their yellow flowers and dissected leaves. Various shrubs are non-natives from Australia that thrive in coastal ranges and transverse ranges of California. The flowers of *Acacia* spp. can be pollinated by beetles, bees and wasps. Its seeds, spread by ants, birds, wind, water, or waste, can be long-lived, germinating after fires or other disturbances.

Leptospermum laevigatum belongs to the family Myrtaceae and is native to southeastern Australia. This small tree has white flowers and narrow leaves and grows in sand dunes in the San Francisco Bay and central and south coast ranges of California. Its seeds are spread via wind, vehicles, soil movement, water and dumped garden waste (CAL-IPC 2017).

Grevillea species are evergreen trees and shrubs distributed in central and southern coastal California (Calflora 2017). They are native to Australia and naturalized in

California along with tropical and subtropical regions of the world (CAL-IPC 2017). They are prolific seeders with light weight seeds dispersed by wind. They can also spread via root suckers.

Stands of *Acacia* spp., *Albizia lophantha*, *Leptospermum laevigatum*, *Grevillea* spp. or related shrubs to small trees occur sporadically in California, particularly along the coast and in the Coast Ranges. They are often near development or from horticultural plantings, where these plants have escaped and are sometimes naturally reproducing in the wild along coastal hills.

Local Vegetation Description

The Australian wattle - Grevillea - Tea tree ruderal patches Alliance forms a continuous shrub layer. The emergent tree layer is typically sparse, and the herbaceous layer is sparse. Shrubs that often dominate include *Acacia* spp., *Albizia lophantha*, and *Leptospermum laevigatum*. Commonly associated emergent trees at sparse cover include *Hesperocyparis macrocarpa*, *Notholithocarpus densiflorus*, and *Pinus radiata*. *Marah fabaceus* is an herb often present. Herbs that are sometimes present include *Achillea millefolium*, *Anagallis arvensis*, *Cardamine oligosperma*, *Carduus pycnocephalus*, *Carpobrotus edulis*, *Claytonia perfoliata*, *Conium maculatum*, *Daucus pusillus*, *Dipsacus* spp., *Fragaria chiloensis*, *Galium aparine*, *Hirschfeldia incana*, *Melilotus* spp., *Myosotis latifolia*, *Pseudognaphalium* spp., *Pteridium aquilinum*, *Sanicula crassicaulis*, *Sonchus asper*, *Stellaria media*, and *Torilis arvensis*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.7	0 – 2	27.5	20 – 35
Hardwood	0.0	0 – 0.2	12.5	10 – 15
Regenerating or Shrubby Tree	0.1	0.0 – 0.2	2.1	0.5 – 5
Shrub	82.7	80 – 88	2.6	0.5 – 5
Herb	0.5	0.2 – 1	0.3	0 – 0.5

Local Membership Rule

A non-native *Acacia* spp., *Albizia lophantha*, *Grevillea* spp., and/or *Leptospermum laevigatum* dominates or co-dominates together in the shrub or low tree canopy. If *Acacia melanoxylon* is dominant, key to the *Eucalyptus* spp. – *Ailanthus altissima* – *Robinia pseudoacacia* Woodland Semi-Natural Alliance.

Local Environmental Description

Elevation: Mean 197 m, Range 59 – 470 m

Aspect: Variable (1), Flat (1), SW (1)

Slope: Mean 12 degrees, Range 0 – 30 degrees

Macro Topography: Lower 1/3 of slope (1), Ridge top (1), Upper 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: Mean 0.1%, Range 0.0 – 0.2%

Fines Cover: Mean 27.7%, Range 0.0 – 68.0%

Litter Cover: Mean 69.0%, Range 30.0 – 95%

Soil Texture (field assessed): Coarse, loamy sand (1), Medium sand (1), Sand, (class unknown) (1)

Geology (field or map data): Sand dunes (1), Sandstone (1), Shale and other sedimentary (1)

San Mateo County Watersheds: Half Moon Bay (1), San Francisco Coastal (1),

Other Watersheds, San Francisco Co.: San Francisco Coastal (1)

Site Impacts

This alliance has greater cover of exotics than natives, non-native plant cover averages 97.5% relative to native cover. Non-native species that occur with highest frequency and abundance include *Albizia lophantha*, *Anagallis arvensis*, *Carduus pycnocephalus*, *Carpobrotus edulis*, *Conium maculatum*, *Hirschfeldia incana*, *Ilex aquifolium*, *Leptospermum laevigatum*, *Myosotis latifolia*, *Sonchus asper*, *Stellaria media*, and *Torilis arvensis*.

Associations in San Mateo County

- *Acacia (cyclops, dealbata)*

Classification Comments

This alliance is new and was first used in Marin County (Buck-Diaz et al. 2021).

References: Buck-Diaz et al. 2021

Global Rarity Rank: GNA **State Rarity Rank:** SNA

Surveys Used for Description

Total: N=3; San Mateo County (n=2): SMAT0053, SMAT0218

San Francisco County (n=1): SMAT0229

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Pinus radiata</i>	33.3	30.3	0.7	2	2				
	<i>Hesperocyparis macrocarpa</i>	33.3	33.3	0.3	1	1				
	<i>Notholithocarpus densiflorus</i>	33.3	3.0	0.1	0.2	0.2				
Regenerating or Shrubby Trees	<i>Hesperocyparis macrocarpa</i>	33.3	33.3	0.1	0.2	0.2				

Shrub

<i>Acacia</i> spp.	66.7	37.3	32.7	10	88.2	Y
<i>Albizia lophantha</i>	66.7	33.3	26.7	0.2	80	Y
<i>Leptospermum laevigatum</i>	33.3	29.0	23.3	70	70	
<i>Sambucus racemosa</i>	33.3	0.1	0.1	0.2	0.2	
<i>Toxicodendron diversilobum</i>	33.3	0.1	0.1	0.2	0.2	
<i>Ilex aquifolium</i>	33.3	0.1	0.1	0.2	0.2	
<i>Baccharis pilularis</i>	33.3	0.1	0.1	0.2	0.2	
<i>Rubus ursinus</i>	33.3	0.1	0.1	0.2	0.2	

Herb

<i>Marah fabaceus</i>	66.7	6.4	0.1	0.2	0.2	Y
<i>Hirschfeldia incana</i>	33.3	3.3	0.1	0.2	0.2	
<i>Achillea millefolium</i>	33.3	3.3	0.1	0.2	0.2	
<i>Sonchus asper</i>	33.3	3.3	0.1	0.2	0.2	
<i>Stellaria media</i>	33.3	3.0	0.1	0.2	0.2	
<i>Sanicula crassicaulis</i>	33.3	3.0	0.1	0.2	0.2	
<i>Pteridium aquilinum</i>	33.3	3.3	0.1	0.2	0.2	
<i>Pseudognaphalium</i> spp.	33.3	16.7	0.1	0.2	0.2	
unknown <i>Poaceae</i>	33.3	3.0	0.1	0.2	0.2	
<i>Myosotis latifolia</i>	33.3	3.0	0.1	0.2	0.2	
<i>Melilotus</i> spp.	33.3	3.3	0.1	0.2	0.2	
<i>Galium aparine</i>	33.3	3.0	0.1	0.2	0.2	
<i>Fragaria chiloensis</i>	33.3	3.3	0.1	0.2	0.2	
<i>Dipsacus</i> spp.	33.3	3.0	0.1	0.2	0.2	
<i>Daucus pusillus</i>	33.3	3.3	0.1	0.2	0.2	
<i>Conium maculatum</i>	33.3	3.0	0.1	0.2	0.2	
<i>Claytonia perfoliata</i>	33.3	3.0	0.1	0.2	0.2	
<i>Carduus pycnocephalus</i>	33.3	3.0	0.1	0.2	0.2	
<i>Cardamine oligosperma</i>	33.3	3.0	0.1	0.2	0.2	
<i>Anagallis arvensis</i>	33.3	3.3	0.1	0.2	0.2	
<i>Torilis arvensis</i>	33.3	3.3	0.1	0.2	0.2	
<i>Carpobrotus edulis</i>	33.3	16.7	0.1	0.2	0.2	

***Acacia (cyclops, dealbata)* Provisional Semi-natural Association**

Common Name: Acacia Ruderal Shrubland

Alliance: *Acacia* spp. – *Grevillea* spp. – *Leptospermum laevigatum* Provisional Semi-Natural Alliance

Local Vegetation Description

The Acacia Ruderal Shrubland Association forms a continuous shrub layer in the single sample available. The emergent tree layer is typically sparse to open, and the herbaceous layer is sparse. Dominant and characteristic shrubs include *Acacia dealbata*, and those that are present include *Ilex aquifolium* and *Rubus ursinus*. Herbs that present include *Cardamine oligosperma*, *Carduus pycnocephalus*, *Claytonia perfoliata*, *Conium maculatum*, *Dipsacus* sp., *Galium aparine*, *Marah fabaceus*, *Myosotis latifolia*, *Sanicula crassicaulis*, and *Stellaria media*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	2.0	NA	27.5	20 – 35
Hardwood	0.2	NA	12.5	10 – 15
Regenerating or Shrubby Tree	0.0	NA	no data	no data
Shrub	88.0	NA	0.8	0.5 – 1
Herb	1.0	NA	0.3	0 – 0.5

Local Environmental Description

Elevation: 470 m

Aspect: Flat (1)

Slope: 0 degrees

Macro Topography: Ridge top (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: 0.0%

Litter Cover: 95%

Soil Texture (field assessed): Coarse, loamy sand (1)

Geology (field or map data): Shale and other sedimentary (1)

San Mateo County Watersheds: Half Moon Bay (1)

Site Impacts

This association has greater cover of exotics (average 96.1%) than natives. Non-native species that occur with highest frequency and abundance include *Acacia dealbata*, *Carduus pycnocephalus*, *Conium maculatum*, *Dipsacus* sp., *Ilex aquifolium*, *Myosotis latifolia*, *Pinus radiata*, and *Stellaria media*.

Acacia (cyclops, dealbata) Provisional Semi-natural Association

Acacia spp. – *Grevillea* spp. – *Leptospermum laevigatum* Shrubland Provisional Semi-Natural Alliance

Classification Comments

This association is newly described as an association here, though it has been mapped in Orange County and on the Palos Verdes Peninsula. It is considered provisional since it is under-sampled in its expected range.

References: Buck-Diaz and Evens 2015, Verdone and Evens 2010

Global Rarity Rank: GNA **State Rarity Rank:** SNA **State Rare:** N

Surveys Used for Description

Total: N=1; San Mateo County (n=1): SMAT0053

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Pinus radiata</i>	100.0	90.9	2.0	2	2		Y		Y
	<i>Notholithocarpus densiflorus</i>	100.0	9.1	0.2	0.2	0.2				Y
Shrub	<i>Acacia spp.</i>	100.0	99.5	88.2	88.2	88.2		Y		Y
	<i>Rubus ursinus</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Ilex aquifolium</i>	100.0	0.2	0.2	0.2	0.2				Y
Herb	<i>Galium aparine</i>	100.0	9.1	0.2	0.2	0.2				Y
	<i>Stellaria media</i>	100.0	9.1	0.2	0.2	0.2				Y
	<i>Myosotis latifolia</i>	100.0	9.1	0.2	0.2	0.2				Y
	<i>Cardamine oligosperma</i>	100.0	9.1	0.2	0.2	0.2				Y
	<i>Carduus pycnocephalus</i>	100.0	9.1	0.2	0.2	0.2				Y
	<i>Claytonia perfoliata</i>	100.0	9.1	0.2	0.2	0.2				Y
	<i>Dipsacus spp.</i>	100.0	9.1	0.2	0.2	0.2				Y
	<i>Marah fabaceus</i>	100.0	9.1	0.2	0.2	0.2				Y
	<i>unknown Poaceae</i>	100.0	9.1	0.2	0.2	0.2				Y
	<i>Sanicula crassicaulis</i>	100.0	9.1	0.2	0.2	0.2				Y
	<i>Conium maculatum</i>	100.0	9.1	0.2	0.2	0.2				Y

***Adenostoma fasciculatum* Shrubland Alliance**



Common Name: Chamise chaparral

NVC Alliance Code: A3868. *Adenostoma fasciculatum* Chaparral Alliance

Statewide Description

Adenostoma fasciculatum is dominant in the shrub canopy with *Adenostoma sparsifolium*, *Arctostaphylos glandulosa*, *Arctostaphylos manzanita*, *Arctostaphylos viscida*, *Ceanothus* spp., *Diplacus aurantiacus*, *Eriodictyon californicum*, *Eriogonum fasciculatum*, *Hesperoyucca whipplei*, *Heteromeles arbutifolia*, *Quercus berberidifolia*, *Quercus wislizeni*, *Salvia apiana*, *Salvia leucophylla*, *Salvia mellifera*, and *Toxicodendron diversilobum*. Emergent trees may be present at low cover.

This alliance occurs across cismontane California in a variety of topographic settings from coastal bluffs to steep, lower montane slopes. In stands older than 60 years of age, little new growth is produced as dead stem biomass increases. In earlier treatments, several chaparral series were assigned to mixed alliances other than *Adenostoma fasciculatum* when other shrubs were co-dominant (Sawyer and Keeler-Wolf 1995). Following extensive review and the analysis of many more plots, most mixed stands where another indicator species is either strongly dominant or co-dominant with *A. fasciculatum* were treated as part of other alliances, such as the *Quercus durata* Alliance, with the exception of the *Adenostoma fasciculatum* – *Salvia* spp. Alliance.

Local Vegetation Description

Adenostoma fasciculatum Shrubland Alliance

The Chamise chaparral Alliance forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is sparse to open. Dominant and characteristic shrubs include *Adenostoma fasciculatum* and *Heteromeles arbutifolia*, and those that are often present include *Arctostaphylos crustacea*. Commonly associated emergent trees at sparse cover include *Pseudotsuga menziesii*. Herbs that are often present include *Clinopodium douglasii*, and herbs that are sometimes present include *Chlorogalum pomeridianum*, *Galium californicum*, and *Pentagramma triangularis*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.4	0 – 2	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0.0 – 0.0	3.5	2 – 5
Shrub	81.8	37.5 – 98.0	3.5	2 – 5
Herb	3.1	0 – 13	0.3	0 – 0.5

Local Membership Rule

Adenostoma fasciculatum dominates, often with sub-dominant shrubs such as *Arctostaphylos manzanita*, *A. glandulosa*, or *Diplacus aurantiacus*. If *A. fasciculatum* co-dominates with *Arctostaphylos* spp., *Ceanothus cuneatus*, *Cercocarpus montanus*, *Quercus berberidifolia*, or *Q. durata*, key to one of the latter alliances instead of *A. fasciculatum*. If co-dominant with *Salvia mellifera*, key to *Adenostoma fasciculatum* – *Salvia* spp. Alliance.

Local Environmental Description

Elevation: Mean 241 m, Range 179 – 271 m

Aspect: SE (1)

Slope: 5 degrees

Macro Topography: Ridge top (1)

Large Rock: 0.0%

Small Rock: Mean 12.5%, Range 0.0 – 25%

Fines Cover: Mean 35.0%, Range 35 – 35%

Litter Cover: Mean 27.6%, Range 0.2 – 55%

Soil Texture (field assessed): Moderately fine sandy clay loam (1)

Geology (field or map data): Volcanic and metavolcanic rocks (7), Sandstone (1)

San Mateo County Watersheds: San Mateo Bayside (8)

Site Impacts

This alliance has very low non-native plant cover (average 0.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira caryophyllea* and *Logfia gallica*.

Associations in San Mateo County

- *Adenostoma fasciculatum*

Adenostoma fasciculatum Shrubland Alliance

- *Adenostoma fasciculatum* – *Diplacus aurantiacus*

Classification Comments

None.

References: AECOM 2013, Borchert et al. 2004, Buck-Diaz and Evens 2011b, Buck-Diaz et al. 2012, Evens and Kentner 2006, Evens and San 2004, Evens and San 2005, Evens et al. 2004, Evens et al. 2006, Keeler-Wolf and Evens 2006, Keeler-Wolf et al. 2003a, Keeler-Wolf et al. 2003b, Kittel et al. 2012, Klein and Evens 2005, Klein et al. 2007, Klein et al. 2015, Reyes et al. 2020

Global Rarity Rank: G5

State Rarity Rank: S5

Surveys Used for Description

Total: N=8; San Mateo County (n=8): GGNRA364, PGA1002, PGA1003, PGA1012, PGA1013, PGA12055, PGA998, PWMIC02

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Pseudotsuga menziesii</i>	22.2	22.2	0.2	0.2	2	N	N	N	N
Shrub	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Adenostoma fasciculatum</i>	100.0	84.8	73.9	50	85	Y	Y	N	Y
Shrub	<i>Arctostaphylos crustacea</i>	66.7	4.0	3.4	0.2	16	N	N	N	Y
Shrub	<i>Heteromeles arbutifolia</i>	66.7	1.7	1.5	0.2	5	N	N	N	Y
Shrub	<i>Toxicodendron diversilobum</i>	44.4	1.7	1.5	0.2	10	N	N	N	N
Shrub	<i>Baccharis pilularis</i>	44.4	0.8	0.7	0.2	5	N	N	N	N
Shrub	<i>Lonicera hispidula</i>	44.4	0.2	0.2	0.2	1	N	N	N	N
Shrub	<i>Ceanothus thyrsiflorus</i>	33.3	1.3	1.1	0.2	5	N	N	N	N
Shrub	<i>Arctostaphylos spp.</i>	22.2	1.5	1.3	2	10	N	N	N	N
Shrub	<i>Frangula californica</i>	22.2	1.2	1.1	0.2	10	N	N	N	N
Shrub	<i>Prunus ilicifolia</i>	22.2	1.0	0.9	3	5	N	N	N	N
Shrub	<i>Ceanothus cuneatus</i>	22.2	0.6	0.6	0.2	5	N	N	N	N
Shrub	<i>Rubus ursinus</i>	22.2	0.4	0.4	0.2	3	N	N	N	N
Shrub	<i>Diplacus aurantiacus</i>	22.2	0.3	0.2	1	1	N	N	N	N
Herb	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Clinopodium douglasii</i>	55.6	16.8	1.4	0.2	10	N	N	N	Y
Herb	<i>Galium californicum</i>	44.4	8.2	1.5	0.2	10	N	N	N	N
Herb	<i>Chlorogalum pomeridianum</i>	33.3	15.3	0.9	2	4	N	N	N	N

Adenostoma fasciculatum Shrubland Alliance

Herb	<i>Dryopteris arguta</i>	22.2	2.4	0.4	1	3	N	N	N	N
Herb	<i>Marah fabaceus</i>	22.2	11.6	0.2	1	1	N	N	N	N
Herb	<i>Sanicula crassicaulis</i>	22.2	0.6	0.1	0.2	1	N	N	N	N
Herb	<i>Festuca californica</i>	22.2	0.6	0.1	0.2	1	N	N	N	N
Herb	<i>Aira caryophyllea</i>	22.2	0.2	0.0	0.2	0.2	N	N	N	N
Herb	<i>Logfia gallica</i>	22.2	0.2	0.0	0.2	0.2	N	N	N	N
Herb	<i>Pentagramma triangularis</i>	22.2	1.7	0.0	0.2	0.2	N	N	N	N
Non-Vascular	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Of
Non-vascular	Moss	33.3	27.8	3.1	3	20	N	N	N	N

Adenostoma fasciculatum Association

Common Name: Chamise Shrubland

Alliance: *Adenostoma fasciculatum* Shrubland Alliance

Local Vegetation Description

The Chamise Association forms a continuous shrub layer. The emergent tree layer is typically sparse, and the herbaceous layer is sparse to open. Dominant and characteristic shrubs include *Adenostoma fasciculatum*, and those that are often present include *Arctostaphylos crustacea* and *Heteromeles arbutifolia*. Herbs that are often present include *Chlorogalum pomeridianum*, *Clinopodium douglasii*, and *Galium californicum*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.2	0 – 1	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	91.0	85 – 98	3.5	2 – 5
Herb	2.4	0 – 6	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 233 m, Range 179 – 263 m

Aspect: SE (1)

Slope: Mean 5 degrees, Range 5 – 5 degrees

Macro Topography: Ridge top (1)

Large Rock: 0.0%

Small Rock: 25.0%

Fines Cover: no data

Litter Cover: 0.2%

Soil Texture (field assessed): Moderately fine sandy clay loam (1)

Geology (field or map data): Volcanic and metavolcanic rocks (5), Sandstone (1)

San Mateo County Watersheds: San Mateo Bayside (6)

Site Impacts

This association has very low non-native plant cover (average 0.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira caryophyllea* and *Logfia gallica*.

Classification Comments

None.

References: AECOM 2013, Borchert et al. 2004, Buck-Diaz and Evens 2011b, Buck-
Adenostoma fasciculatum Association
Adenostoma fasciculatum Shrubland Alliance

Diaz et al. 2012, Evens and San 2004, Evens and San 2005, Evens et al. 2004, Evens et al. 2006, Keeler-Wolf and Evens 2006, Keeler-Wolf et al. 2003b, Kittel et al. 2012, Klein and Evens 2005, Klein et al. 2007, Klein et al. 2015, Reyes et al. 2020

Global Rarity Rank: G5 **State Rarity Rank:** S5 **State Rare:** N

Surveys Used for Description

Total: N=6; San Mateo County (n=6): GGNRA364, PGA1003, PGA1012, PGA1013, PGA12055, PGA998

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Adenostoma fasciculatum</i>	100.0	90.8	80.5	75	85		Y		Y
	<i>Arctostaphylos crustacea</i>	66.7	2.7	2.3	2	5				Y
	<i>Heteromeles arbutifolia</i>	66.7	1.6	1.4	0.2	5				Y
	<i>Ceanothus cuneatus</i>	33.3	0.9	0.9	0.2	5				
	<i>Ceanothus thyrsiflorus</i>	33.3	0.9	0.9	0.2	5				
	<i>Baccharis pilularis</i>	33.3	0.2	0.2	0.2	1				
	<i>Lonicera hispidula</i>	33.3	0.1	0.1	0.2	0.2				
Herb	<i>Chlorogalum pomeridianum</i>	50.0	22.9	1.3	2	4				Y
	<i>Clinopodium douglasii</i>	50.0	15.4	0.4	0.2	1				Y
	<i>Galium californicum</i>	50.0	5.8	0.5	0.2	2				Y

***Adenostoma fasciculatum* – *Diplacus aurantiacus* Association**

Common Name: Chamise – Bush Monkeyflower Shrubland

Alliance: *Adenostoma fasciculatum* Shrubland Alliance

Local Vegetation Description

The Chamise – Bush Monkeyflower Association forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is sparse to open. Dominant and characteristic shrubs include *Adenostoma fasciculatum* and *Diplacus aurantiacus*, and those that are often present include *Baccharis pilularis*, *Heteromeles arbutifolia*, and *Toxicodendron diversilobum*. Commonly associated emergent trees at sparse cover include *Quercus agrifolia* and *Umbellularia californica*. The herbaceous layer that are sometimes present include *Chlorogalum pomeridianum*, *Galium porrigens*, *Melica torreyana*, and *Pentagramma triangularis*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	1.0	0 – 2	no data	no data
Hardwood	0.1	0 – 0.2	7.5	5 – 10
Regenerating or Shrubby Tree	0.0	0 – 0	3.5	2 – 5
Shrub	58.8	37.5 – 80.0	2.3	0.5 – 5
Herb	3.3	1 – 8	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 408 m, Range 218 – 890 m

Aspect: SW (2)

Slope: Mean 17 degrees, Range 11 – 22 degrees

Macro Topography: Middle 1/3 of slope (2)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 36.2%, Range 14.6 – 59.0%

Litter Cover: Mean 32.8%, Range 6.4 – 55%

Soil Texture (field assessed): Moderately fine sandy clay loam (1), Moderately coarse, sandy loam (1)

Geology (field or map data): Volcanic and metavolcanic rocks (2), Sandstone (1), Franciscan melange (1)

San Mateo County Watersheds: San Mateo Bayside (2)

Other Watersheds, Santa Clara Co.: Alameda Creek (1), Palo Alto (1)

Site Impacts

This association has very low non-native plant cover (average 0.0%) relative to native *Adenostoma fasciculatum* – *Diplacus aurantiacus* Association
Adenostoma fasciculatum Shrubland Alliance

cover. No non- natives were recorded by the surveyors.

Classification Comments

Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Evens and Kentner 2006, Keeler-Wolf and Evens 2006, Keeler-Wolf et al. 2003a, Klein and Evens 2005, Klein et al. 2015

Global Rarity Rank: G4 **State Rarity Rank:** S4 **State Rare:** N

Surveys Used for Description

Total: N=4; San Mateo County (n=2): PGA1002, PWMIC02

Santa Clara County (n=2): SCLAR119, VASE0004

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	50.0	50.0	0.8	0.2	3				Y
	<i>Pseudotsuga menziesii</i>	25.0	25.0	0.5	2	2				
Shrub	<i>Adenostoma fasciculatum</i>	100.0	77.6	67.2	62.5	71.4		Y		Y
	<i>Toxicodendron diversilobum</i>	75.0	3.4	3.1	0.2	10				Y
	<i>Heteromeles arbutifolia</i>	75.0	1.7	1.5	1	3				Y
	<i>Diplacus aurantiacus</i>	50.0	1.5	1.3	1	4				Y
	<i>Baccharis pilularis</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Ceanothus cuneatus</i>	25.0	5.4	4.9	19.5	19.5				
	<i>Artemisia californica</i>	25.0	4.9	4.3	17	17				
	<i>Frangula californica</i>	25.0	2.7	2.5	10	10				
	<i>Prunus ilicifolia</i>	25.0	0.8	0.8	3	3				
	<i>Rubus ursinus</i>	25.0	0.8	0.8	3	3				
	<i>Arctostaphylos spp.</i>	25.0	0.6	0.5	2	2				
	<i>Clematis lasiantha</i>	25.0	0.3	0.3	1	1				
	<i>Lotus scoparius</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Arctostaphylos crustacea</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Lonicera hispidula</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Ribes spp.</i>	25.0	0.1	0.1	0.2	0.2				
Herb	<i>Pentagramma triangularis</i>	50.0	2.1	0.1	0.2	0.2				Y

Adenostoma fasciculatum – *Diplacus aurantiacus* Association
Adenostoma fasciculatum Shrubland Alliance

	<i>Galium porrigens</i>	50.0	2.1	0.1	0.2	0.2		Y
	<i>Stachys ajugoides</i>	25.0	25.0	0.3	1	1		
	<i>Marah fabaceus</i>	25.0	25.0	0.1	0.2	0.2		
	<i>Nassella lepida</i>	25.0	17.9	0.5	2	2		
	<i>Clinopodium douglasii</i>	25.0	14.5	2.5	10	10		
	<i>Marah oreganus</i>	25.0	4.4	0.8	3	3		
	<i>Dryopteris arguta</i>	25.0	4.4	0.8	3	3		
	unknown Asteraceae	25.0	1.8	0.1	0.2	0.2		
	<i>Pseudognaphalium californicum</i>	25.0	1.8	0.1	0.2	0.2		
	<i>Cynoglossum grande</i>	25.0	0.3	0.1	0.2	0.2		
	<i>Galium spp.</i>	25.0	0.3	0.1	0.2	0.2		
	<i>Polystichum munitum</i>	25.0	0.3	0.1	0.2	0.2		
	<i>Maianthemum racemosum</i>	25.0	0.3	0.1	0.2	0.2		
Non-Vascular								
	Lichen	50.0	31.3	5.8	3	20		Y
	Moss	50.0	18.8	5.3	1	20		Y

***Arctostaphylos (crustacea, tomentosa)* Shrubland Alliance**



Common Name: Brittle leaf – woolly leaf manzanita chaparral

NVC Alliance Code: A3858. *Arctostaphylos tomentosa* ssp. *crustacea* - *Arctostaphylos tomentosa* Central Coast & Island Chaparral Alliance

Statewide Description

Arctostaphylos crustacea, *Arctostaphylos regismontana* or *Arctostaphylos tomentosa* is dominant, co-dominant, or characteristically present in the shrub canopy with *Adenostoma fasciculatum*, *Arctostaphylos* spp., *Artemisia californica*, *Baccharis pilularis*, *Ceanothus* spp., *Cercocarpus montanus*, *Chrysolepis chrysophylla* var. *minor*, *Ericameria ericoides*, *Eriogonum fasciculatum*, *Frangula californica*, *Heteromeles arbutifolia*, *Salvia mellifera* and *Toxicodendron diversilobum*. Emergent trees may be present at low cover, including *Pinus coulteri* or *Quercus agrifolia*.

The alliance includes stands where *A. crustacea* ssp. *crustacea*, ssp. *crinita*, and ssp. *rosei* are dominant or codominant in the shrub canopy; ssp. *eastwoodiana* grows in the *Arctostaphylos (purissima, rudis)* special stands at Burton Mesa in Santa Barbara Co. Some stands in the East Bay Hills are fragmented and degraded, with only remnant scattered individuals of *A. crustacea* and a significantly higher cover of *Adenostoma fasciculatum*. We still consider such stands as members of the *A. crustacea* alliance. Additionally, other stands include *A. tomentosa* ssp. *tomentosa* as the dominant or co-dominant in the shrub canopy. Since *A. crustacea* and *A. tomentosa* overlap ecologically (for example, at Fort Ord Military Reservation), we have some evidence for

merging of these two taxa into this one alliance. However, we need more data and analysis to understand relationships between this and other maritime chaparral types.

Local Vegetation Description

The Brittle leaf – woolly leaf manzanita chaparral Alliance forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is sparse to open.

Dominant and characteristic shrubs include *Arctostaphylos crustacea*, and those that are often present include *Adenostoma fasciculatum* and *Toxicodendron diversilobum*. Commonly associated emergent trees at sparse cover include *Arbutus menziesii*, *Pseudotsuga menziesii*, and *Quercus agrifolia*.

Commonly associated non-vascular plants include Lichen and Moss.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.3	0 – 2	17.5	5 – 35
Hardwood	2.8	0 – 20	4.6	0.5 – 10
Regenerating or Shrubby Tree	2.1	0.0 – 16.0	1.1	0 – 2
Shrub	79.0	46.0 – 95.0	2.8	0.5 – 5
Herb	1.7	0 – 8	0.3	0 – 0.5

Local Membership Rule

Arctostaphylos crustacea dominates or co-dominates with *Adenostoma fasciculatum*, *Arctostaphylos regismontana*, *Ceanothus cuneatus*, *C. papillosus*, *Frangula californica*, *Heteromeles arbutifolia*, *Quercus parvula*, or *Q. wislizeni* var. *frutescens*. Trees are often present but at significantly less cover.

Local Environmental Description

Elevation: Mean 380 m, Range 132 – 730 m

Aspect: SE (4), SW (3), NE (2), Variable (1), NW (1)

Slope: Mean 18 degrees, Range 2 – 35 degrees

Macro Topography: Upper 1/3 of slope (5), Middle 1/3 of slope (2), Middle to Upper 1/3 of slope (1), Upper 1/3 of slope to Ridgetop (1), Ridge top (1)

Large Rock: Mean 3.0%, Range 0.0 – 16.0%

Small Rock: Mean 2.6%, Range 0.0 – 10.0%

Fines Cover: Mean 15.7%, Range 0.0 – 35.0%

Litter Cover: Mean 67.6%, Range 18.8 – 96%

Soil Texture (field assessed): Moderately coarse, sandy loam (5), Moderately fine silty clay loam (1), Medium to very fine, sandy loam (1), Medium to very fine, loamy sand (1), Coarse, loamy sand (1), Coarse sand (1)

Geology (field or map data): Sandstone (7), Shale and other sedimentary (2), Sedimentary (type unknown) (2), Franciscan melange (2), Sandstone and other sedimentary (1), Volcanic and metavolcanic rocks (1)

San Mateo County Watersheds: San Mateo Bayside (7), Pescadero Creek (4), Palo Alto (3), San Gregorio Creek (1)

Site Impacts

This alliance has very low non-native plant cover (average 0.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Gastridium phleoides*, *Hypochaeris glabra*, and *Soliva sessilis*.

Associations in San Mateo County

- *Arctostaphylos crustacea*
- *Arctostaphylos crustacea* – *Adenostoma fasciculatum* – *Ceanothus (cuneatus, papillosus)*

Classification Comments

Both *A. crustacea* ssp. *crinita* and ssp. *crustacea* are included as dominant plants in these samples.

References: Keeler-Wolf et al. 2003a, Rodriguez et al. 2017, Sawyer and Evens 2007

Global Rarity Rank: G3 **State Rarity Rank:** S3

Surveys Used for Description

Total: N=16; San Mateo County (n=16): GGNRA327, PGA1043, PGA11509, PGA12702, PGA961, PWMIC02A, SMAT0002, SMAT0003, SMAT0034, SMAT0051, SMAT0063, SMAT0215, SMAT0258, SMAT0289, SMATR0655, VASE0050

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	37.5	29.0	1.0	0.2	10				
	<i>Pseudotsuga menziesii</i>	31.3	11.1	0.7	0.2	7				
	<i>Arbutus menziesii</i>	31.3	7.8	0.3	0.2	2.1				
Regenerating or Shrubby Trees	<i>Quercus agrifolia</i>	25.0	20.3	0.5	0.2	7.2				
Shrub	<i>Arctostaphylos crustacea</i>	100.0	70.8	55.2	10	90	Y	Y		Y
	<i>Adenostoma fasciculatum</i>	75.0	15.3	11.9	0.2	60	Y			Y
	<i>Arctostaphylos (crustacea, tomentosa)</i> Shrubland Alliance									

	<i>Toxicodendron diversilobum</i>	50.0	3.4	3.1	0.2	19.5	Y
	<i>Eriodictyon californicum</i>	43.8	0.2	0.1	0.1	1	
	<i>Heteromeles arbutifolia</i>	37.5	0.6	0.4	0.2	3	
	<i>Baccharis pilularis</i>	25.0	1.7	1.5	0.2	20	
	<i>Rubus ursinus</i>	25.0	1.0	0.8	1	5	
	<i>Ceanothus thyrsiflorus</i>	25.0	0.7	0.7	0.2	10	
	<i>Pickeringia montana</i>	25.0	0.9	0.7	0.2	10	
	<i>Diplacus aurantiacus</i>	25.0	0.1	0.1	0.2	1	
	<i>Lotus scoparius</i>	25.0	0.1	0.1	0.2	0.2	
Non-Vascular							
	Lichen	56.3	29.7	2.6	0.2	20	Y
	Moss	50.0	26.5	4.3	0.2	25	Y

***Arctostaphylos crustacea* Association**

Common Name: Brittle Leaf Manzanita Chaparral Shrubland

Alliance: *Arctostaphylos (crustacea, tomentosa)* Shrubland Alliance

Local Vegetation Description

The Brittle Leaf Manzanita Chaparral Association forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is sparse to open. Dominant and characteristic shrubs include *Arctostaphylos crustacea*, and those that are often present include *Adenostoma fasciculatum*, *Eriodictyon californicum*, and *Toxicodendron diversilobum*. Commonly associated emergent trees at sparse cover include *Arbutus menziesii*, *Pseudotsuga menziesii*, and *Quercus agrifolia*. Commonly associated non-vascular plants include Lichen and Moss.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.5	0 – 2	17.5	5 – 35
Hardwood	4.0	0 – 20	4.6	0.5 – 10
Regenerating or Shrubby Tree	2.7	0 – 16.0	1.1	0 – 2
Shrub	74.4	46.0 – 90.0	2.8	0.5 – 5
Herb	1.2	0 – 5	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 395 m, Range 132 – 696 m

Aspect: SE (4), NE (2), SW (2), Variable (1)

Slope: Mean 18 degrees, Range 2 – 32 degrees

Macro Topography: Upper 1/3 of slope (3), Middle 1/3 of slope (2), Middle to Upper 1/3 of slope (1), Not recorded (1), Ridge top (1), Upper 1/3 of slope to Ridgetop (1)

Large Rock: Mean 2.6%, Range 0.0 – 16.0%

Small Rock: Mean 3.7%, Range 0.0 – 10.0%

Fines Cover: Mean 13.9%, Range 0.0 – 35.0%

Litter Cover: Mean 67.1%, Range 18.8 – 96%

Soil Texture (field assessed): Moderately coarse, sandy loam (4), Moderately fine silty clay loam (1), Coarse sand (1), Medium to very fine, sandy loam (1), Medium to very fine, loamy sand (1)

Geology (field or map data): Sandstone (6), Franciscan melange (2), Sandstone and other sedimentary (1), Sedimentary (type unknown) (1), Shale and other sedimentary (1)

San Mateo County Watersheds: San Mateo Bayside (4), Palo Alto (3), Pescadero Creek (3), San Gregorio Creek (1)

Arctostaphylos crustacea Association
Arctostaphylos (crustacea, tomentosa) Shrubland Alliance

Site Impacts

This association has very low non-native plant cover (average 0.0%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis* and *Gastroidium phleoides*.

Classification Comments

None.

References: Keeler-Wolf et al. 2003a, Rodriguez et al. 2017, Sawyer and Evens 2007

Global Rarity Rank: G3 **State Rarity Rank:** S3 **State Rare:** Y

Surveys Used for Description

Total: N=12; San Mateo County (n=12): GGNRA327, PGA11509, PGA12702, PGA961, SMAT0002, SMAT0051, SMAT0063, SMAT0215, SMAT0258, SMAT0289, SMATR0655, VASE0050

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	41.7	30.4	1.0	0.2	10				
	<i>Pseudotsuga menziesii</i>	41.7	14.8	1.0	0.2	7				
	<i>Arbutus menziesii</i>	41.7	10.4	0.5	0.2	2.1				
Regenerating or Shrubby Trees	<i>Quercus wislizeni</i>	25.0	24.7	1.4	0.2	15.4				
	<i>Quercus agrifolia</i>	25.0	22.9	0.7	0.2	7.2				
Shrub	<i>Arctostaphylos crustacea</i>	100.0	82.9	64.2	30	90		Y		Y
	<i>Adenostoma fasciculatum</i>	66.7	2.6	2.1	0.2	15				Y
	<i>Toxicodendron diversilobum</i>	58.3	4.1	3.8	0.2	19.5				Y
	<i>Eriodictyon californicum</i>	50.0	0.2	0.2	0.1	1				Y
	<i>Heteromeles arbutifolia</i>	33.3	0.3	0.2	0.2	2				
	<i>Diplacus aurantiacus</i>	33.3	0.2	0.1	0.2	1				
	<i>Baccharis pilularis</i>	25.0	1.8	1.8	0.2	20				

Arctostaphylos crustacea Association
Arctostaphylos (crustacea, tomentosa) Shrubland Alliance

	<i>Pickeringia montana</i>	25.0	1.2	0.9	0.2	10	
	<i>Rubus ursinus</i>	25.0	0.9	0.9	1	5	
	<i>Ceanothus thyrsiflorus</i>	25.0	0.9	0.9	0.2	10	
	<i>Lotus scoparius</i>	25.0	0.1	0.1	0.2	0.2	
	<i>Lepechinia calycina</i>	25.0	0.1	0.0	0.1	0.2	
Non-Vascular							
Non-vascular	Lichen	50.0	23.9	1.1	0.2	5	Y
Non-vascular	Moss	41.7	26.1	4.0	0.2	25	

***Arctostaphylos crustacea* – *Adenostoma fasciculatum* – *Ceanothus (cuneatus, papillosus)* Association**

Common Name: Brittle Leaf Manzanita – Chamise – Ceanothus Chaparral Shrubland

Alliance: *Arctostaphylos (crustacea, tomentosa)* Shrubland Alliance

Local Vegetation Description

The Brittle Leaf Manzanita – Chamise – Ceanothus Chaparral Association forms a continuous shrub layer. The emergent tree layer is typically absent to open, and the herbaceous layer is sparse to open. Dominant and characteristic shrubs include *Adenostoma fasciculatum* and *Arctostaphylos crustacea*, and those that are often present include *Ceanothus cuneatus* and *Heteromeles arbutifolia*. Commonly associated emergent trees at sparse cover include *Quercus agrifolia*. Herbs that are sometimes present include *Clinopodium douglasii*, *Dryopteris arguta*, *Galium aparine*, *Galium porrigens*, *Hypochaeris glabra*, *Madia sativa*, *Maianthemum racemosum*, *Marah fabaceus*, *Marah oreganus*, *Nassella pulchra*, *Pentagramma triangularis*, *Polystichum munitum*, *Sanicula crassicaulis*, and *Soliva sessilis*. Commonly associated non-vascular plants include Lichen and Moss.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.8	0 – 3	no data	no data
Regenerating or Shrubby Tree	0.1	0 – 0.4	3.5	2 – 5
Shrub	76.6	38.0 – 95.0	3.0	1 – 5
Herb	1.1	0.2 – 3	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 338 m, Range 159 – 730 m

Aspect: SW (3), NW (1)

Slope: Mean 19 degrees, Range 2 – 35 degrees

Macro Topography: Upper 1/3 of slope (2)

Large Rock: Mean 4.1%, Range 0.0 – 10.4%

Small Rock: Mean 0.1%, Range 0.0 – 0.4%

Fines Cover: Mean 20.1%, Range 0.2 – 35.0%

Litter Cover: Mean 69.0%, Range 55 – 82%

Soil Texture (field assessed): Coarse, loamy sand (1), Moderately coarse, sandy loam (1)

Geology (field or map data): Sandstone (1), Sedimentary (type unknown) (1), Shale and other sedimentary (1), Volcanic and metavolcanic rocks (1)

San Mateo County Watersheds: San Mateo Bayside (3), Pescadero Creek (1)

Site Impacts

This association has very low non-native plant cover (average 0.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Hypochaeris glabra* and *Soliva sessilis*.

Classification Comments

None.

References: Sawyer and Evens 2007

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=4; San Mateo County (n=4): PGA1043, PWMIC02A, SMAT0003, SMAT0034

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree										
	<i>Quercus agrifolia</i>	25.0	25.0	0.8	3	3				
Regenerating or Shrubby Trees										
	<i>Quercus chrysolepis</i>	25.0	12.5	0.1	0.2	0.2				
	<i>Quercus agrifolia</i>	25.0	12.5	0.1	0.2	0.2				
Shrub										
	<i>Adenostoma fasciculatum</i>	100.0	53.4	41.3	20	60		Y		Y
	<i>Arctostaphylos crustacea</i>	100.0	34.5	28.0	10	47			Y	Y
	<i>Heteromeles arbutifolia</i>	50.0	1.4	0.8	0.2	3				Y
	<i>Ceanothus cuneatus</i>	50.0	0.3	0.3	0.2	1				Y
	<i>Frangula californica</i>	25.0	4.5	2.5	10	10				
	<i>Toxicodendron diversilobum</i>	25.0	1.3	0.8	3	3				
	<i>Prunus ilicifolia</i>	25.0	1.3	0.8	3	3				
	<i>Rubus ursinus</i>	25.0	1.3	0.8	3	3				
	<i>Baccharis pilularis</i>	25.0	1.3	0.8	3	3				
	<i>Ribes spp.</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Lonicera hispidula</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Eriodictyon californicum</i>	25.0	0.1	0.1	0.2	0.2				

Arctostaphylos crustacea – *Adenostoma fasciculatum* – *Ceanothus (cuneatus, papillosus)* Association
Arctostaphylos (crustacea, tomentosa) Shrubland Alliance

	<i>Pickeringia montana</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Ceanothus thyrsiflorus</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Lotus scoparius</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Ribes californicum</i>	25.0	0.1	0.1	0.2	0.2		
Herb								
	<i>Clinopodium douglasii</i>	25.0	17.0	0.8	3	3		
	<i>Nassella pulchra</i>	25.0	6.3	0.1	0.2	0.2		
	<i>Forb (herbaceous, not grass nor grasslike)</i>	25.0	6.3	0.1	0.2	0.2		
	<i>Galium aparine</i>	25.0	6.3	0.1	0.2	0.2		
	<i>Soliva sessilis</i>	25.0	6.3	0.1	0.2	0.2		
	<i>Sanicula crassicaulis</i>	25.0	6.3	0.1	0.2	0.2		
	<i>Hypochaeris glabra</i>	25.0	6.3	0.1	0.2	0.2		
	<i>Madia sativa</i>	25.0	6.3	0.1	0.2	0.2		
	<i>Marah fabaceus</i>	25.0	6.3	0.1	0.2	0.2		
	<i>Polystichum munitum</i>	25.0	1.1	0.1	0.2	0.2		
	<i>Pentagramma triangularis</i>	25.0	1.1	0.1	0.2	0.2		
	<i>Dryopteris arguta</i>	25.0	1.1	0.1	0.2	0.2		
	<i>Marah oreganus</i>	25.0	1.1	0.1	0.2	0.2		
	<i>Maianthemum racemosum</i>	25.0	1.1	0.1	0.2	0.2		
	<i>Galium porrigens</i>	25.0	1.1	0.1	0.2	0.2		
	<i>Galium spp.</i>	25.0	1.1	0.1	0.2	0.2		
Non-Vascular								
	Lichen	75.0	47.2	7.1	0.2	20	Y	Y
	Moss	75.0	27.8	5.3	0.2	20		Y

***Arctostaphylos (nummularia, sensitiva) – Chrysolepis chrysophylla* Shrubland Alliance**



Common Name: Glossy leaf manzanita - Golden chinquapin chaparral

NVC Alliance Code: A3859. *Arctostaphylos nummularia* - *Arctostaphylos stanfordiana* - *Chrysolepis chrysophylla* var. *minor* North Coast Chaparral Alliance

Statewide Description

Arctostaphylos nummularia or *Arctostaphylos sensitiva* dominate or co-dominate in the shrub canopy with *Arctostaphylos columbiana*, *Arctostaphylos glandulosa* ssp. *glandulosa*, *Arctostaphylos virgata*, *Chrysolepis chrysophylla* var. *minor*, *Pickeringia montana*, *Pteridium aquilinum*, and *Vaccinium ovatum*. Emergent trees may be present at low cover, including *Pinus muricata*, *Pseudotsuga menziesii*, or *Sequoia sempervirens*.

Taxonomic treatments of the *Arctostaphylos nummularia* complex vary (Hickman 1993, McMinn 1939, Parker et al. 2007, 2012). Parker et al. recognize *Arctostaphylos sensitiva*, *A. nummularia* ssp. *nummularia*, and *A. nummularia* ssp. *mendocinoensis* based on bark and habit differences.

Arctostaphylos sensitiva grows in Marin and Santa Cruz Counties and it is included in this alliance. *Arctostaphylos nummularia* occurs from Sonoma to Mendocino County. The more erect plants of this species, from 0.5 to 3 m tall with lower stems gray and shredding (ssp. *nummularia*), are also included in this alliance. The more prostrate

plants, <0.5 meters tall with lower stems gray or reddish and shredding (ssp. *mendocinoensis*), are more often associated with stands of the *Hesperocyparis pigmaea* and *Pinus muricata* Alliances in Mendocino County.

Stands of this alliance are part of the maritime chaparral -- see the maritime chaparral discussion in Sawyer et al. (2009). This alliance occurs on coastal slopes with nutrient poor soils and relatively high amounts of the spring-summer fog, with its distribution in the northern Central Coast to North Coast from Santa Cruz to Mendocino Co., while the *Arctostaphylos (crustacea, tomentosa)* alliance has a broader distribution in the Central Coast region from San Mateo to Santa Barbara Co. on out to the Channel Islands.

Local Vegetation Description

The Glossy leaf manzanita - Golden chinquapin chaparral Alliance forms an open to continuous shrub layer. The emergent tree layer is typically sparse to continuous, and the herbaceous layer is sparse to open. Dominant and characteristic shrubs include *Vaccinium ovatum*, and those that are often present include *Arctostaphylos montaraensis*. Commonly associated emergent trees at sparse cover include *Chrysolepis chrysophylla* var. *minor* and *Pinus attenuata*. Herbs that are often present include *Pteridium aquilinum*, and herbs that are sometimes present include *Clinopodium douglasii* and *Polystichum munitum*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	1.4	0 – 8	9.2	5 – 15
Hardwood	5.0	0 – 50	5.2	2 – 10
Regenerating or Shrubby Tree	9.2	0.0 – 80.0	1.5	0 – 5
Shrub	69.1	28.0 – 90.0	2.7	0 – 5
Herb	3.3	0 – 15	0.4	0 – 2

Local Membership Rule

Some stands have *Chrysolepis chrysophylla* strongly dominant in dense, clonal stands occurring on upper slopes and ridges, often transitional between forest and chaparral, while other stands have *Arctostaphylos sensitiva*, *A. virgata*, *Chrysolepis chrysophylla* var. *minor* and/or *Vaccinium ovatum* dominant or co-dominant in maritime chaparral stands. *Arctostaphylos manzanita* and/or *Chrysolepis chrysophylla* stands particularly occur along Mt. Tamalpais – Bolinas Ridge. *Pinus muricata*, *Sequoia sempervirens*, and *Pteridium aquilinum* are often present. Stands are often transitional between forest and chaparral.

Local Environmental Description

Elevation: Mean 381 m, Range 227 – 519 m

Aspect: NE (5), SW (4), NW (4), SE (1)

Slope: Mean 15 degrees, Range 2 – 32 degrees

Macro Topography: Ridge top (5), Upper 1/3 of slope (3), Upper 1/3 of slope to Ridgetop (2), Not recorded (2), Middle 1/3 of slope (1), Middle to Upper 1/3 of slope (1)

Arctostaphylos (nummularia, sensitiva) – Chrysolepis chrysophylla Shrubland Alliance

Large Rock: Mean 0.7%, Range 0.0 – 4.0%

Small Rock: Mean 14.5%, Range 0.0 – 60.0%

Fines Cover: Mean 17.7%, Range 0.0 – 50.0%

Litter Cover: Mean 50.5%, Range 0.0 – 100%

Soil Texture (field assessed): Moderately fine sandy clay loam (6), Coarse, loamy sand (2), Medium sand (2), Medium silt (1), Medium to very fine, sandy loam (1), Moderately coarse, sandy loam (1), Not recorded (1)

Geology (field or map data): Granitic (6), Granitic (generic) (4), Mixed metamorphic (2), Sandstone, shale, and conglomerate (2), Sedimentary (type unknown) (2), Siltstone (2), Mixed sedimentary (1), Sandstone (1), Shale and other sedimentary (1)

San Mateo County Watersheds: Pacifica (8), Half Moon Bay (5), San Mateo Bayside (3), Ano Nuevo (2), Davenport (2), Pescadero Creek (1)

Site Impacts

This alliance has very low non-native plant cover (average 0.3%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira caryophyllea*, *Cortaderia jubata*, and *Rumex acetosella*.

Associations in San Mateo County

- *Arctostaphylos montaraensis* –
Arctostaphylos imbricata *Arctostaphylos sensitiva*
- *Chrysolepis chrysophylla* / *Vaccinium ovatum*

Classification Comments

This alliance is a merge of two previously accepted alliances, *Arctostaphylos (nummularia, sensitiva)* and *Chrysolepis chrysophylla*.

References: Buck and Evens 2010, Evens and Kentner 2006, Keeler-Wolf et al. 2003a, VegCAMP 2018

Global Rarity Rank: G2

State Rarity Rank: S2

Surveys Used for Description

Total: N=22; San Mateo County (n=22): GGNRA329, PGA1822, PGA742, PGA744, PGA745, PGA985, PGA990, PGA993, PWNMC02A, SMAT0018, SMAT0019, SMAT0068, SMAT0154, SMAT0159, SMAT0231, SMAT0234, SMAT0306, SMAT0308, SMAT0686, SMATR0670, VASE0006, VASE0080

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front

matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Off
Tree	<i>Chrysolepis chrysophylla</i> var. <i>minor</i>	22.7	19.6	3.6	1	50				
	<i>Pinus attenuata</i>	22.7	11.4	1.0	1	8				
Regenerating or Shrubby Trees	<i>Chrysolepis chrysophylla</i> var. <i>minor</i>	27.3	27.3	8.8	0.2	80				
Shrub	<i>Vaccinium ovatum</i>	77.3	24.4	15.9	0.2	76.2	Y			Y
	<i>Arctostaphylos montaraensis</i>	59.1	27.1	23.2	5	75				Y
	<i>Rubus ursinus</i>	45.5	1.2	1.2	0.2	12.4				
	<i>Ceanothus thyrsiflorus</i>	40.9	3.1	3.2	0.1	35				
	<i>Frangula californica</i>	40.9	3.1	2.8	0.2	40				
	<i>Baccharis pilularis</i>	40.9	3.0	2.7	0.2	12.6				
	<i>Arctostaphylos crustacea</i>	40.9	2.9	2.0	0.2	29.7				
	<i>Toxicodendron diversilobum</i>	31.8	2.9	2.2	0.2	20				
	<i>Diplacus aurantiacus</i>	27.3	0.4	0.3	0.2	3.3				
	<i>Rubus parviflorus</i>	27.3	0.4	0.2	0.2	2				
	<i>Arctostaphylos sensitiva</i>	22.7	17.4	7.1	2	55				
	<i>Ribes sanguineum</i>	22.7	0.1	0.0	0.2	0.2				
	Herb	<i>Pteridium aquilinum</i>	54.5	34.1	1.5	0.2	10.7			
<i>Polystichum munitum</i>		31.8	9.2	0.6	0.1	5				
<i>Clinopodium douglasii</i>		22.7	3.9	0.1	0.2	0.3				
Non-Vascular	Lichen	36.4	25.5	0.2	0.2	3				

***Arctostaphylos montaraensis* – *Arctostaphylos imbricata* Provisional Association**

Common Name: Montara Manzanita – San Bruno Mountain Manzanita Shrubland

Alliance: *Arctostaphylos (nummularia, sensitiva)* – *Chrysolepis chrysophylla* Shrubland Alliance

Local Vegetation Description

The Montara Manzanita – San Bruno Mountain Manzanita Association forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is sparse to open. Dominant and characteristic shrubs include *Arctostaphylos montaraensis* or *Arctostaphylos imbricata* with *Vaccinium ovatum*, and those that are often present include *Baccharis pilularis*, *Ceanothus thyrsiflorus*, *Frangula californica*, *Rubus ursinus*, and *Toxicodendron diversilobum*. Commonly associated emergent trees at sparse cover include *Quercus agrifolia*. Herbs that are often present include *Polystichum munitum* and *Pteridium aquilinum*, and herbs that are sometimes present include *Clinopodium douglasii* and *Scrophularia californica*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.1	0 – 1	12.5	10 – 15
Hardwood	1.0	0 – 5	5.5	2 – 10
Regenerating or Shrubby Tree	6.2	0 – 68.7	3.5	2 – 5
Shrub	81.2	60.0 – 90.0	2.7	0 – 5
Herb	4.7	0 – 15	0.6	0 – 2

Local Environmental Description

Elevation: Mean 354 m, Range 227 – 437 m

Aspect: NE (4), NW (2)

Slope: Mean 10 degrees, Range 2 – 16 degrees

Macro Topography: Ridge top (2), Middle 1/3 of slope (1), Not recorded (1), Upper 1/3 of slope (1), Upper 1/3 of slope to Ridgetop (1)

Large Rock: Mean 0.7%, Range 0.0 – 2.0%

Small Rock: Mean 0.3%, Range 0.0 – 1.0%

Fines Cover: Mean 5.1%, Range 0.0 – 10.7%

Litter Cover: Mean 48.3%, Range 0.0 – 96%

Soil Texture (field assessed): Moderately fine sandy clay loam (3), Medium sand (1), Moderately coarse, sandy loam (1), Not recorded (1)

Geology (field or map data): Granitic (4), Granitic (generic) (2), Mixed metamorphic (2), Sandstone, shale, and conglomerate (2), Sandstone (1)

San Mateo County Watersheds: Pacifica (5), Half Moon Bay (4), San Mateo Bayside (2)

Site Impacts

This association has very low non-native plant cover (average 0.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Cortaderia jubata*.

Classification Comments

This association is considered provisional since it is under-sampled in its expected range. It is newly described here.

References: none

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=12; San Mateo County (n=12): PGA1822, PGA742, PGA745, PGA985, PGA990, PGA993, SMAT0018, SMAT0068, SMAT0159, SMATR0670, VASE0006, VASE0080

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	25.0	20.1	0.3	0.2	2				
	<i>Chrysolepis chrysophylla</i> var. <i>minor</i>	25.0	25.0	6.2	0.2	68.7				
Regenerating or Shrubby Trees										
Shrub	<i>Arctostaphylos montaraensis</i>	83.3	43.5	38.8	18	75			Y	Y
	<i>Vaccinium ovatum</i>	75.0	12.9	15.1	0.2	76.2				Y
	<i>Baccharis pilularis</i>	66.7	5.4	4.9	2	12.6				Y
	<i>Rubus ursinus</i>	66.7	2.1	2.2	0.2	12.4				Y
	<i>Frangula californica</i>	58.3	5.5	5.2	0.2	40				Y
	<i>Ceanothus thyrsiflorus</i>	58.3	5.4	5.9	0.1	35				Y
	<i>Toxicodendron diversilobum</i>	50.0	4.6	4.0	1	20				Y
	<i>Diplacus aurantiacus</i>	41.7	0.6	0.6	0.2	3.3				
	<i>Rubus parviflorus</i>	33.3	0.6	0.4	1	2				
	<i>Ribes sanguineum</i>	33.3	0.1	0.1	0.2	0.2				
Herb										

Arctostaphylos montaraensis – *Arctostaphylos imbricata* Provisional Association
Arctostaphylos (nummularia, sensitiva) – *Chrysolepis chrysophylla* Shrubland Alliance

<i>Pteridium aquilinum</i>	50.0	23.1	1.9	0.2	10.7	Y
<i>Polystichum munitum</i>	50.0	16.6	1.1	0.1	5	Y
<i>Scrophularia californica</i>	33.3	5.7	0.4	0.2	3	
<i>Clinopodium douglasii</i>	25.0	5.1	0.1	0.2	0.3	

***Arctostaphylos sensitiva* Association**

Common Name: Glossyleaf Manzanita Shrubland

Alliance: *Arctostaphylos (nummularia, sensitiva) – Chrysolepis chrysophylla* Shrubland Alliance

Local Vegetation Description

The Glossyleaf Manzanita Association forms an open to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is sparse. *Arctostaphylos sensitiva* is dominant in the shrub canopy with *Vaccinium ovatum*, and other characteristic shrubs include *Arctostaphylos crustacea*. Commonly associated emergent trees at sparse cover include *Pinus attenuata*, *Quercus chrysolepis*, and *Pseudotsuga menziesii*. The herbaceous layer typically includes *Lotus junceus*. Commonly associated non-vascular plants include Lichen.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	6.6	1 – 13	6.7	2 – 10
Hardwood	2.6	1 – 7	4.3	2 – 10
Regenerating or Shrubby Tree	1.2	0 – 5.0	1.0	0 – 2
Shrub	47.4	28.0 – 74.0	1.8	0.5 – 5
Herb	0.4	0.2 – 1	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 371 m, Range 315 – 411 m

Aspect: SW (4), NE (1)

Slope: Mean 17 degrees, Range 11 – 23 degrees

Macro Topography: Ridge top (3), Upper 1/3 of slope (1), Middle to Upper 1/3 of slope (1)

Large Rock: Mean 0.9%, Range 0.0 – 4.0%

Small Rock: Mean 30.4%, Range 5.0 – 60.0%

Fines Cover: Mean 31.8%, Range 22.0 – 43.0%

Litter Cover: Mean 34.4%, Range 12.0 – 70%

Soil Texture (field assessed): Coarse, loamy sand (3), Medium silt (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Mixed sedimentary (2), Sedimentary (type unknown) (2), Siltstone (1)

San Mateo County Watersheds: Ano Nuevo (2), Davenport (1), Pescadero Creek (1)

Other Watersheds, Santa Cruz Co.: Ano Nuevo (1)

Site Impacts

This association has very low non-native plant cover (average 0.0%) relative to native

Arctostaphylos sensitiva Association
Arctostaphylos (nummularia, sensitiva) – Chrysolepis chrysophylla Shrubland Alliance

cover. No non- native species were recorded by the surveyors.

Classification Comments

This association includes surveys from two previously accepted associations dominated by *Arctostaphylos sensitiva* with similar species composition. Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Evens and Kentner 2006, Keeler-Wolf et al. 2003a

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=5; San Mateo County (n=4): SMAT0231, SMAT0234, SMAT0308, SMAT0686

Santa Cruz County (n=1): SMAT0663

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Pinus attenuata</i>	100.0	59.1	4.8	1	8		Y		Y
	<i>Quercus chrysolepis</i>	75.0	19.1	2.3	0.2	7				Y
	<i>Pseudotsuga menziesii</i>	50.0	2.4	0.3	0.2	1				Y
	<i>Chrysolepis chrysophylla</i> var. <i>minor</i>	25.0	12.5	0.3	1	1				
	<i>Chrysolepis chrysophylla</i> var. <i>chrysophylla</i>	25.0	6.9	0.5	2	2				
	<i>Chrysolepis chrysophylla</i>	25.0	6.9	0.5	2	2				
Regenerating or Shrubby Trees	<i>Pseudotsuga menziesii</i>	50.0	33.3	0.1	0.2	0.2				Y
	<i>Chrysolepis chrysophylla</i> var. <i>minor</i>	25.0	25.0	0.1	0.2	0.2				
	<i>Quercus wislizeni</i>	25.0	8.3	0.1	0.2	0.2				
	<i>Quercus chrysolepis</i>	25.0	8.3	0.1	0.2	0.2				
Shrub	<i>Arctostaphylos sensitiva</i>	100.0	94.4	38.8	25	55		Y		Y
	<i>Arctostaphylos</i>	100.0	4.0	1.4	0.2	2.2				Y

Arctostaphylos sensitiva Association
Arctostaphylos (nummularia, sensitiva) – Chrysolepis chrysophylla Shrubland Alliance

	<i>crustacea</i>							
	<i>Vaccinium ovatum</i>	75.0	1.2	0.6	0.2	2		Y
	<i>Gaultheria shallon</i>	25.0	0.2	0.1	0.2	0.2		
	<i>Eriodictyon californicum</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Dendromecon rigida</i>	25.0	0.1	0.1	0.2	0.2		
Herb								
	<i>Lotus junceus</i>	100.0	100.0	0.2	0.2	0.2	Y	Y
Non-Vascular								
	Lichen	75.0	75.0	0.2	0.2	0.2	Y	Y

***Chrysolepis chrysophylla* / *Vaccinium ovatum* Association**

Common Name: Giant Chinquapin / Black Huckleberry Shrubland

Alliance: *Arctostaphylos (nummularia, sensitiva)* – *Chrysolepis chrysophylla* Shrubland Alliance

Local Vegetation Description

The Giant Chinquapin / Black Huckleberry Association forms an intermittent to continuous shrub layer. The emergent tree layer is may be sparse to continuous, and the herbaceous layer is sparse to open. *Chrysolepis chrysophylla* var. *minor* is often dominant as a shrubby tree or tall shrub. Other dominant and characteristic shrubs include *Vaccinium ovatum*, and those that are often present include *Arctostaphylos crustacea* and *Arctostaphylos montaraensis*. Commonly associated emergent trees include *Chrysolepis chrysophylla* var. *chrysophylla*. The herbaceous layer typically includes *Pteridium aquilinum*, and herbs that are sometimes present include *Clinopodium douglasii*. Commonly associated non-vascular plants include Lichen.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	1.0	0 – 4	12.5	10 – 15
Hardwood	14.7	0 – 85	7.5	5 – 10
Regenerating or Shrubby Tree	32.7	0 – 80	no data	no data
Shrub	37.6	3 – 75	3.5	2 – 5
Herb	3.0	0 – 5	0.4	0 – 1

Local Environmental Description

Elevation: Mean 443 m, Range 321 – 519 m

Aspect: NW (2), NE (1), SE (1)

Slope: Mean 19 degrees, Range 4 – 32 degrees

Macro Topography: Upper 1/3 of slope (1), Upper 1/3 of slope to Ridgetop (1), Ridge top (1), Not recorded (1)

Large Rock: Mean 0.3%, Range 0.0 – 1.0%

Small Rock: Mean 2.8%, Range 0.0 – 6.0%

Fines Cover: Mean 20.7%, Range 5.0 – 50.0%

Litter Cover: Mean 78.8%, Range 40.0 – 100%

Soil Texture (field assessed): Moderately fine sandy clay loam (2), Medium sand (1), Medium to very fine, sandy loam (1)

Geology (field or map data): Granitic (2), Granitic (generic) (2), Siltstone (1), Shale and other sedimentary (1)

San Mateo County Watersheds: Pacifica (3), Davenport (1), Half Moon Bay (1), San Mateo Bayside (1)

Site Impacts

This association has low non-native plant cover (average 1.0%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira caryophylla*, *Cirsium vulgare*, *Holcus lanatus*, *Hypochaeris radicata*, *Plantago lanceolata*, and *Vulpia myuros*.

Classification Comments

None.

References: Buck and Evens 2010, Evens and Kentner 2006, Keeler-Wolf et al. 2003a, VegCAMP 2018

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=6; San Mateo County (n=6): GGNRA329, PGA744, PWNMC02A, SMAT0019, SMAT0154, SMAT0306

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree										
	<i>Chrysolepis chrysophylla</i> var.	33.3	33.3	14.7	3	85				
	<i>Chrysolepis chrysophylla</i>									
	<i>Chrysolepis chrysophylla</i> var. <i>minor</i>	33.3	30.3	11.3	18	50				
Regenerating or Shrubby Trees										
	<i>Chrysolepis chrysophylla</i> var. <i>minor</i>	33.3	33.3	20.0	40	80				
Shrub										
	<i>Vaccinium ovatum</i>	83.3	63.0	27.5	10	50		Y		Y
	<i>Arctostaphylos crustacea</i>	66.7	4.9	1.4	0.2	5				Y
	<i>Arctostaphylos montaraensis</i>	50.0	12.3	7.5	5	25				Y
	<i>Rubus parviflorus</i>	33.3	0.4	0.1	0.2	0.2				
	<i>Rubus ursinus</i>	33.3	0.4	0.1	0.2	0.2				
	<i>Ceanothus thyrsiflorus</i>	33.3	0.4	0.1	0.2	0.2				
	<i>Fragula californica</i>	33.3	0.4	0.1	0.2	0.2				
Herb										
	<i>Pteridium aquilinum</i>	100.0	78.9	1.6	0.2	5		Y		Y

Chrysolepis chrysophylla / *Vaccinium ovatum* Association
Arctostaphylos (nummularia, sensitiva) – *Chrysolepis chrysophylla* Shrubland Alliance

Non-Vascular	<i>Clinopodium douglasii</i>	33.3	3.9	0.1	0.2	0.2	
	<i>Lichen</i>	50.0	25.3	0.1	0.2	0.2	Y
	<i>Moss</i>	33.3	24.7	1.7	0.2	10	

***Artemisia californica* – (*Salvia leucophylla*) Shrubland Alliance**



Common Name: California sagebrush – (purple sage) scrub

NVC Alliance Code: A3883. *Artemisia californica* - *Salvia leucophylla* Mesic Scrub Alliance

Statewide Description

Artemisia californica is dominant or co-dominant in the shrub canopy with *Adenostoma fasciculatum*, *Baccharis pilularis*, *Cleome isomeris*, *Diplacus aurantiacus*, *Encelia californica*, *Eriogonum fasciculatum*, *Hesperoyucca whipplei*, *Isocoma menziesii*, *Keckiella cordifolia*, *Lotus scoparius*, *Opuntia littoralis*, *Rhus integrifolia*, *Salvia apiana*, *Salvia leucophylla*, *Salvia mellifera*, *Sambucus nigra* and *Toxicodendron diversilobum*. Emergent trees or tall shrubs may be present at low cover.

Stands of this alliance occur in modal settings of coastal scrub throughout the central and southern California Coast Ranges. It is found particularly on steep slopes and in high abundance on protected, north-facing hillsides. Closer to the coast in the northern portion of its range, *A. californica* commonly mixes with *Baccharis pilularis* and transitions into the *Baccharis pilularis* alliance when that species becomes co-dominant. Farther inland and in drier portions of the southern coastal area, *A. californica* mixes with *Eriogonum fasciculatum* and transitions to the *Eriogonum fasciculatum* alliance where both species can co-dominate (Rundel 2007).

Local Vegetation Description

Artemisia californica – (*Salvia leucophylla*) Shrubland Alliance

The California sagebrush – (purple sage) scrub Alliance forms an open to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is sparse to open. Dominant and characteristic shrubs include *Artemisia californica*, *Baccharis pilularis*, and *Diplacus aurantiacus*, and those that are often present include *Toxicodendron diversilobum*. The herbs that are often present include *Chlorogalum pomeridianum*, and herbs that are sometimes present include *Achillea millefolium*, *Anagallis arvensis*, *Avena* spp., *Bromus hordeaceus*, *Dudleya farinosa*, *Eriogonum latifolium*, *Eriophyllum stoechadifolium*, *Fragaria vesca*, *Galium aparine*, *Hirschfeldia incana*, *Lobularia maritima*, *Marah fabaceus*, *Nassella pulchra*, *Pseudognaphalium californicum*, *Pseudognaphalium ramosissimum*, *Scrophularia californica*, and *Sonchus asper*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.1	0 – 1	3.5	2 – 5
Hardwood	0.2	0 – 2	12.5	10 – 15
Regenerating or Shrubby Tree	0.0	0.0 – 0.2	1.5	1 – 2
Shrub	64.6	25.0 – 90.0	0.9	0 – 2
Herb	11.6	0 – 30	0.3	0 – 0.5

Local Membership Rule

Artemisia californica dominates and may intermix with *Baccharis pilularis*, *Diplacus aurantiacus*, and/or *Toxicodendron diversilobum*. If *Baccharis pilularis* is present, *Artemisia californica* is greater in cover for this alliance.

Local Environmental Description

Elevation: Mean 149 m, Range 41 – 337 m

Aspect: SW (6), NE (1), SE (1), NW (1), S (1)

Slope: Mean 24 degrees, Range 10 – 50 degrees

Macro Topography: Upper 1/3 of slope (4), Middle 1/3 of slope (3), Lower 1/3 of slope (1), Lower to Middle 1/3 of slope (1), Ridge top (1)

Large Rock: Mean 1.5%, Range 0.0 – 10.0%

Small Rock: Mean 19.7%, Range 1.0 – 75.0%

Fines Cover: Mean 31.8%, Range 5.3 – 60.0%

Litter Cover: Mean 35.5%, Range 0.0 – 80%

Soil Texture (field assessed): Moderately coarse, sandy loam (2), Not recorded (2), Coarse, loamy sand (1), Fine clay (1), Loam, (class unknown) (1), Medium to very fine, sandy loam (1), Moderately fine sandy clay loam (1), Sand, (class unknown) (1)

Geology (field or map data): Volcanic and metavolcanic rocks (3), Sedimentary (type unknown) (2), Sandstone and other sedimentary (2), Shale and other sedimentary (1), Mixed sedimentary (1), Granitic (generic) (1), Granitic (1), Franciscan melange (1)

San Mateo County Watersheds: San Francisco Coastal (4), Pacifica (3), Palo Alto (2),

San Mateo Bayside (2), Ano Nuevo (1)

Site Impacts

This alliance has low non-native plant cover (average 4.9%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Bromus hordeaceus*, *Hirschfeldia incana*, *Lobularia maritima*, and *Sonchus asper*.

Associations in San Mateo County

- *Artemisia californica*
- *Artemisia californica* – *Diplacus aurantiacus*
- *Artemisia californica* / *Nassella (pulchra)*

Classification Comments

None.

References: AECOM 2013, Buck and Evens 2010, Buck-Diaz and Evens 2011b, CNPS Vegetation Program 2015, Dixon 2019, Evens and San 2005, Evens et al. 2006, Gordon and White 1994, HDR 2014b, Keeler-Wolf and Evens 2006, Keeler-Wolf et al. 2003a, Kirkpatrick and Hutchinson 1977, Kittel et al. 2012, Reyes et al. 2020, Rodriguez et al. 2017, Sproul et al. 2011, Verdone and Evens 2010

Global Rarity Rank: G5

State Rarity Rank: S5

Surveys Used for Description

Total: N=14; San Mateo County (n=14): GGNRA263, PGA1749, PGA1753, PGA1755, SCLAR149, SCLAR160, SFANS10, SMAT0007, SMAT0078, SMAT0134, SMAT0198, WRBL033, WRBL042, WRBL107

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	100	60.2	45.0	40.0	50.0	Y	Y		Y
	<i>Quercus kelloggii</i>	100	18.1	14.0	8.0	20.0	Y			Y
	<i>Umbellularia californica</i>	50	12.5	10.0	20.0	20.0				Y
	<i>Quercus douglasii</i>	50	5.6	4.0	8.0	8.0				Y
	<i>Quercus lobata</i>	50	3.5	2.5	5.0	5.0				Y

**Regenerating
or Shrubby
Trees**

Artemisia californica – (*Salvia leucophylla*) Shrubland Alliance

	<i>Quercus agrifolia</i> *	50	16.7	0.1	0.2	0.2			Y
	<i>Quercus kelloggii</i> *	50	16.7	0.1	0.2	0.2			Y
	<i>Umbellularia californica</i> *50	16.7	0.1	0.2	0.2				Y
Shrub									
	<i>Artemisia californica</i>	100.0	62.5	42.0	23	63	Y	Y	Y
	<i>Baccharis pilularis</i>	100.0	22.6	16.9	1	45.74 3	Y		Y
	<i>Diplacus aurantiacus</i>	78.6	5.9	4.1	0.2	20	Y		Y
	<i>Toxicodendron diversilobum</i>	64.3	4.6	2.8	0.652 8	10			Y
	<i>Frangula californica</i>	35.7	0.9	0.5	0.2	5			
	<i>Rubus ursinus</i>	35.7	0.7	0.4	0.2	2			
Herb									
	<i>Chlorogalum pomeridianum</i>	50.0	3.2	0.7	0.2	6			Y
	<i>Eriophyllum stoechadifolium</i>	42.9	18.5	3.8	0.2	30			
	<i>Anagallis arvensis</i>	35.7	5.2	0.4	0.2	3.066 7			
	<i>Eriogonum latifolium</i>	35.7	1.6	0.2	0.2	2			
	<i>Marah fabaceus</i>	35.7	2.6	0.2	0.2	2			
	<i>Dudleya farinosa</i>	35.7	0.8	0.1	0.2	0.5			
	<i>Bromus hordeaceus</i>	28.6	7.8	1.0	0.2	10			
	<i>Avena spp.</i>	28.6	4.1	0.7	0.2	6			
	<i>Achillea millefolium</i>	28.6	1.6	0.4	0.2	5			
	<i>Scrophularia californica</i>	28.6	0.9	0.1	0.2	0.9			
	<i>Hirschfeldia incana</i>	28.6	0.8	0.1	0.2	0.5			
	<i>Nassella pulchra</i>	21.4	7.5	1.6	1	12			
	<i>Forb (herbaceous, not grass nor grasslike)</i>	21.4	3.8	0.9	0.2	12			
	<i>Lobularia maritima</i>	21.4	1.8	0.3	0.2	3			
	<i>Pseudognaphalium ramosissimum</i>	21.4	0.7	0.1	0.2	1			
	<i>Galium aparine</i>	21.4	0.6	0.1	0.2	0.5			
	<i>Pseudognaphalium californicum</i>	21.4	0.6	0.1	0.2	0.5			
	<i>Fragaria vesca</i>	21.4	0.3	0.1	0.2	0.5			
	<i>Sonchus asper</i>	21.4	1.0	0.1	0.2	0.5			

***Artemisia californica* Association**

Common Name: California Sagebrush Shrubland

Alliance: *Artemisia californica* – (*Salvia leucophylla*) Shrubland Alliance

Local Vegetation Description

The California Sagebrush Association forms an open to continuous shrub layer. The emergent tree layer is typically sparse, and the herbaceous layer is sparse to open. Dominant and characteristic shrubs include *Artemisia californica*, *Baccharis pilularis*, and *Toxicodendron diversilobum*, and those that are often present include *Diplacus aurantiacus*. Commonly associated emergent trees at sparse cover include *Quercus agrifolia*. Herbs that are often present include *Eriophyllum stoechadifolium* and *Marah fabaceus*, and herbs that are sometimes present include *Anagallis arvensis*, *Avena* spp., *Bromus hordeaceus*, *Chlorogalum pomeridianum*, *Dudleya farinosa*, *Eriogonum latifolium*, *Galium aparine*, *Geranium dissectum*, *Vulpia myuros*, and *Zigadenus fremontii*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.4	0 – 2	12.5	10 – 15
Regenerating or Shrubby Tree	0.0	0 – 0.2	1.5	1 – 2
Shrub	54.5	25.0 – 90.0	0.9	0 – 2
Herb	8.7	1 – 30	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 163 m, Range 77 – 337 m

Aspect: SW (2), NW (1), SE (1), NE (1)

Slope: Mean 20 degrees, Range 10 – 35 degrees

Macro Topography: Upper 1/3 of slope (2), Ridge top (1), Lower 1/3 of slope (1), Lower to Middle 1/3 of slope (1), Middle 1/3 of slope (1)

Large Rock: Mean 2.1%, Range 0.0 – 10.0%

Small Rock: Mean 12.4%, Range 5.0 – 35.0%

Fines Cover: Mean 37.4%, Range 10.0 – 60.0%

Litter Cover: Mean 35.7%, Range 0.0 – 80%

Soil Texture (field assessed): Moderately coarse, sandy loam (2), Moderately fine sandy clay loam (1), Not recorded (1), Sand, (class unknown) (1), Fine clay (1)

Geology (field or map data): Shale and other sedimentary (1), Franciscan melange (1), Granitic (generic) (1), Mixed sedimentary (1), Sandstone and other sedimentary (1), Sedimentary (type unknown) (1)

San Mateo County Watersheds: Palo Alto (2), San Mateo Bayside (2), Pacifica (1), San Francisco Coastal (1)

Artemisia californica Association
Artemisia californica – (*Salvia leucophylla*) Shrubland Alliance

Site Impacts

This association has low non-native plant cover (average 4.8%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Avena spp.*, *Bromus hordeaceus*, *Geranium dissectum*, and *Vulpia myuros*.

Classification Comments

None.

References: AECOM 2013, Buck-Diaz and Evens 2011b, CNPS Vegetation Program 2015, Dixon 2019, Evens and San 2005, Evens et al. 2006, Gordon and White 1994, HDR 2014b, Keeler-Wolf and Evens 2006, Keeler-Wolf et al. 2003a, Kirkpatrick and Hutchinson 1977, Kittel et al. 2012, Reyes et al. 2020, Rodriguez et al. 2017, Sproul et al. 2011, Verdone and Evens 2010

Global Rarity Rank: G4 **State Rarity Rank:** S4 **State Rare:** N

Surveys Used for Description

Total: N=6; San Mateo County (n=6): SCLAR149, SCLAR160, SMAT0007, SMAT0078, SMAT0134, WRBL042

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	33.3	25.0	0.4	0.2	2				
Shrub	<i>Artemisia californica</i>	100.0	68.7	39.3	23	63		Y		Y
	<i>Baccharis pilularis</i>	100.0	14.6	9.2	1	20				Y
	<i>Toxicodendron diversilobum</i>	83.3	8.0	4.7	1	10				Y
	<i>Diplacus aurantiacus</i>	66.7	3.0	1.5	0.2	5				Y
	<i>Adenostoma fasciculatum</i>	33.3	2.1	0.8	2	3				
	<i>Frangula californica</i>	33.3	0.4	0.2	0.2	1				
Herb	<i>Marah fabaceus</i>	66.7	6.1	0.4	0.2	2				Y
	<i>Eriophyllum stoechadifolium</i>	50.0	22.3	2.5	0.2	10				Y
	<i>Zigadenus fremontii</i>	33.3	7.1	0.5	0.2	3				
	<i>Bromus hordeaceus</i>	33.3	6.9	0.7	0.2	4				
	<i>Vulpia myuros</i>	33.3	5.6	0.5	1	2				
	<i>Anagallis arvensis</i>	33.3	4.9	0.2	0.2	1				

Artemisia californica Association
Artemisia californica – (*Salvia leucophylla*) Shrubland Alliance

<i>Eriogonum latifolium</i>	33.3	3.2	0.4	0.2	2
<i>Chlorogalum pomeridianum</i>	33.3	2.6	0.2	0.2	1
<i>Galium aparine</i>	33.3	1.2	0.1	0.2	0.2
<i>Dudleya farinosa</i>	33.3	1.0	0.1	0.2	0.5
<i>Avena spp.</i>	33.3	1.0	0.1	0.2	0.2
<i>Geranium dissectum</i>	33.3	0.6	0.1	0.2	0.2

***Artemisia californica* – *Diplacus aurantiacus* Association**

Common Name: California Sagebrush – Bush Monkeyflower Shrubland

Alliance: *Artemisia californica* – (*Salvia leucophylla*) Shrubland Alliance

Local Vegetation Description

The California Sagebrush – Bush Monkeyflower Association forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse or absent, and the herbaceous layer is open. Dominant and characteristic shrubs include *Artemisia californica*, *Baccharis pilularis*, and *Diplacus aurantiacus*, and those that are often present include *Rubus ursinus*. Herbs that are often present include *Achillea millefolium*, *Chlorogalum pomeridianum*, *Dudleya farinosa*, *Eriophyllum stoechadifolium*, and *Scrophularia californica*, and herbs that are sometimes present include *Anagallis arvensis*, *Eriogonum latifolium*, *Fragaria vesca*, *Hirschfeldia incana*, *Lobularia maritima*, *Pseudognaphalium californicum*, *Pseudognaphalium ramosissimum*, *Sanicula crassicaulis*, *Sonchus asper*, and *Stachys ajugoides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.6	0 – 3	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0.2	no data	no data
Shrub	78.3	63.0 – 90.0	0.9	0 – 2
Herb	10.0	2 – 20	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 122 m, Range 41 – 238 m

Aspect: SW (3), S (1)

Slope: Mean 29 degrees, Range 19 – 50 degrees

Macro Topography: Middle 1/3 of slope (2), Upper 1/3 of slope (2)

Large Rock: Mean 0.0%, Range 0.0 – 0.0%

Small Rock: Mean 38.0%, Range 1.0 – 75.0%

Fines Cover: Mean 30.0%, Range 30.0 – 30.0%

Litter Cover: Mean 35.0%, Range 3.0 – 67%

Soil Texture (field assessed): Coarse, loamy sand (1), Loam, (class unknown) (1), Medium to very fine, sandy loam (1), Not recorded (1)

Geology (field or map data): Sedimentary (type unknown) (1), Sandstone and other sedimentary (1), Granitic (1)

San Mateo County Watersheds: Pacifica (2), Ano Nuevo (1)

Site Impacts

Artemisia californica – *Diplacus aurantiacus* Association
Artemisia californica – (*Salvia leucophylla*) Shrubland Alliance

This association has low non-native plant cover (average 5.0%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Hirschfeldia incana*, *Lobularia maritima*, and *Sonchus asper*.

Classification Comments

None.

References: AECOM 2013, Buck and Evens 2010, Keeler-Wolf and Evens 2006, Sproul et al. 2011

Global Rarity Rank: G3 **State Rarity Rank:** S3 **State Rare:** Y

Surveys Used for Description

Total: N=5; San Mateo County (n=5): GGNRA263, PGA1749, SMAT0198, WRBL033, WRBL107

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Artemisia californica</i>	100.0	62.1	46.1	30.2	60		Y		Y
	<i>Baccharis pilularis</i>	100.0	23.6	18.2	8.2	30				Y
	<i>Diplacus aurantiacus</i>	100.0	9.8	7.2	0.2	20				Y
	<i>Rubus ursinus</i>	60.0	0.5	0.4	0.2	1				Y
	<i>Toxicodendron diversilobum</i>	40.0	1.5	1.0	2	3				
	<i>Frangula californica</i>	40.0	0.3	0.2	0.2	1				
Herb	<i>Eriophyllum stoechadifolium</i>	60.0	25.1	7.6	2	30				Y
	<i>Chlorogalum pomeridianum</i>	60.0	5.2	1.6	0.2	6				Y
	<i>Achillea millefolium</i>	60.0	4.0	1.1	0.2	5				Y
	<i>Scrophularia californica</i>	60.0	2.0	0.3	0.2	0.9				Y
	<i>Dudleya farinosa</i>	60.0	1.1	0.2	0.2	0.5				Y
	<i>Anagallis arvensis</i>	40.0	7.0	0.3	0.5	1				
	<i>Lobularia maritima</i>	40.0	3.3	0.6	0.2	3				
	<i>Sonchus asper</i>	40.0	1.7	0.1	0.2	0.5				
	<i>Hirschfeldia incana</i>	40.0	1.7	0.1	0.2	0.5				
	<i>Sanicula crassicaulis</i>	40.0	1.7	0.1	0.2	0.5				
	<i>Pseudognaphalium californicum</i>	40.0	1.7	0.1	0.2	0.5				
	<i>Pseudognaphalium</i>	40.0	1.7	0.3	0.5	1				

Artemisia californica – *Diplacus aurantiacus* Association
Artemisia californica – (*Salvia leucophylla*) Shrubland Alliance

<i>ramosissimum</i>					
<i>Fragaria vesca</i>	40.0	0.4	0.1	0.2	0.5
<i>Stachys ajugoides</i>	40.0	0.4	0.1	0.2	0.5
<i>Eriogonum latifolium</i>	40.0	0.4	0.1	0.2	0.5

***Artemisia californica* / *Nassella (pulchra)* Association**

Common Name: Coastal Sagebrush / Purple Needlegrass Scrub Shrubland

Alliance: *Artemisia californica* – (*Salvia leucophylla*) Shrubland Alliance

Local Vegetation Description

The Coastal Sagebrush / Purple Needlegrass Scrub Association forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse, and the herbaceous layer is open. Dominant and characteristic shrubs include *Artemisia californica* and *Baccharis pilularis*, and those that are often present include *Diplacus aurantiacus* and *Toxicodendron diversilobum*. Herbs that are often present include *Anagallis arvensis*, *Chlorogalum pomeridianum*, *Nassella pulchra*, and *Plantago lanceolata*, and herbs that are sometimes present include *Avena* spp., *Clinopodium douglasii*, *Elymus glaucus*, *Eriogonum latifolium*, *Fragaria vesca*, *Galium porrigens*, *Nassella lepida*, and *Pseudognaphalium californicum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.5	0 – 1	3.5	2 – 5
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	67.5	60.0 – 75.0	no data	no data
Herb	25.0	20 – 30	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 158 m, Range 132 – 184 m

Aspect: SW (1)

Slope: 28 degrees

Macro Topography: no data

Large Rock: no data

Small Rock:no data

Fines Cover: 5.3%

Litter Cover:no data

Soil Texture (field assessed): no data

Geology (field or map data): Volcanic and metavolcanic rocks (3)

San Mateo County Watersheds: San Francisco Coastal (3)

Site Impacts

This association has low non-native plant cover (average 4.9%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis*

Artemisia californica / *Nassella (pulchra)* Association
Artemisia californica – (*Salvia leucophylla*) Shrubland Alliance

arvensis, *Avena* spp., and *Plantago lanceolata*.

Classification Comments

None.

References: Dixon 2019, Reyes et al. 2020, Rodriguez et al. 2017

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=3; San Mateo County (n=3): PGA1753, PGA1755, SFANS10

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Pinus radiata</i>	33.3	33.3	0.3	1	1				
Shrub	<i>Artemisia californica</i>	100.0	50.9	40.4	30	51.34 7	Y			Y
	<i>Baccharis pilularis</i>	100.0	37.0	30.2	20	45.74 3			Y	Y
	<i>Diplacus aurantiacus</i>	66.7	5.3	4.2	2.56 5	10				Y
	<i>Toxicodendron diversilobum</i>	66.7	2.9	1.9	0.65 8	5				Y
	<i>Frangula californica</i>	33.3	2.7	1.7	5	5				
	<i>Rubus ursinus</i>	33.3	1.1	0.7	2	2				
	<i>Eriogonum fasciculatum</i>	33.3	0.1	0.1	0.2	0.2				
Herb	<i>Nassella pulchra</i>	66.7	32.5	7.3	10	12				Y
	<i>Plantago lanceolata</i>	66.7	6.1	1.7	0.2	5				Y
	<i>Chlorogalum pomeridianum</i>	66.7	1.0	0.3	0.2	0.66 7				Y
	<i>Nassella lepida</i>	33.3	28.8	10.7	32	32				
	<i>Forb (herbaceous, not grass nor grasslike)</i>	33.3	13.8	4.0	12	12				
	<i>Avena</i> spp.	33.3	10.5	2.0	6	6				
	<i>Anagallis arvensis</i>	33.3	2.8	1.0	3.06 7	3.06 7				
	<i>Symphotrichum chilense</i>	33.3	2.3	0.7	2	2				
	<i>Monardella villosa</i>	33.3	0.6	0.2	0.66 6	0.66 6				

Artemisia californica / *Nassella (pulchra)* Association
Artemisia californica – (*Salvia leucophylla*) Shrubland Alliance

				7	7
<i>Deschampsia danthonioides</i>	33.3	0.4	0.1	0.2	0.2
<i>Bromus hordeaceus</i>	33.3	0.4	0.1	0.2	0.2
<i>Anaphalis margaritacea</i>	33.3	0.4	0.1	0.2	0.2
<i>Eriogonum latifolium</i>	33.3	0.2	0.1	0.2	0.2
<i>Pseudognaphalium californicum</i>	33.3	0.2	0.1	0.2	0.2
<i>Hirschfeldia incana</i>	33.3	0.2	0.1	0.2	0.2

***Baccharis pilularis* Shrubland Alliance**



Common Name: Coyote brush scrub

NVC Alliance Code: A0836. *Baccharis pilularis* Scrub Alliance

Statewide Description

Baccharis pilularis is dominant or co-dominant in the shrub canopy with *Artemisia californica*, *Ceanothus thyrsiflorus*, *Corylus cornuta*, *Diplacus aurantiacus*, *Eriogonum fasciculatum*, *Eriophyllum staechadifolium*, *Frangula californica*, *Garrya elliptica*, *Gaultheria shallon*, *Holodiscus discolor*, *Lotus scoparius*, *Lupinus arboreus*, *Morella californica*, *Rubus ursinus*, *Salvia apiana*, *Salvia leucophylla*, and *Toxicodendron diversilobum*. Emergent trees may be present at low cover, including *Pinus muricata*, *Pseudotsuga menziesii*, *Quercus agrifolia*, or *Umbellularia californica*.

Stands can be transitory to forest and woodland types or persistent for a long time (Heady et al. 1977). Seedlings of *Baccharis pilularis* invade grasslands in the central coast, forming stands when grazing and fire decrease (McBride and Heady 1968). Older, shady stands are transitional to forest types with *Pinus muricata*, *Pseudotsuga menziesii*, *Quercus agrifolia*, and *Umbellularia californica* (Grams et al. 1977, McBride 1974). *Baccharis pilularis* invades recently logged land in northern California well away from the coast. *B. pilularis* also invades coastal dunes stabilized by *Ammophila arenaria* or *Lupinus arboreus* (Pickart and Sawyer 1998).

Baccharis pilularis stands in the Sierra Nevada foothills, along the central coast, and in southern California tend to be largely seral to other scrub and woodland types.

Baccharis pilularis Shrubland Alliance

However, the natural seral relationships between *Baccharis pilularis* and adjacent herbaceous and woody alliances are complex and varied. The core of diverse, older stands of *Baccharis pilularis* lies along the coast from Monterey County to Sonoma County. For example, Borchert et al. (2004) identify a *Baccharis pilularis* Alliance in the northern Santa Lucia Range, where they sampled mid- to late-seral stands (with >25 years since fire).

Local Vegetation Description

The Coyote brush scrub Alliance forms an open to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is sparse to continuous. Dominant and characteristic shrubs include *Baccharis pilularis*, *Rubus ursinus*, and *Toxicodendron diversilobum*, and those that are often present include *Frangula californica*. Herbs that are sometimes present include *Achillea millefolium*, *Aira caryophylla*, *Anagallis arvensis*, *Avena* spp., *Brachypodium distachyon*, *Briza minor*, *Bromus diandrus*, *Bromus hordeaceus*, *Chlorogalum pomeridianum*, *Cirsium vulgare*, *Clinopodium douglasii*, *Conium maculatum*, *Danthonia californica*, *Eriophyllum stoechadifolium*, *Geranium dissectum*, *Heracleum maximum*, *Hypochaeris radicata*, *Marah fabaceus*, *Plantago lanceolata*, *Polystichum munitum*, *Pteridium aquilinum*, *Rumex acetosella*, *Sanicula crassicaulis*, *Scrophularia californica*, *Sisyrinchium bellum*, *Symphotrichum chilense*, and *Vulpia bromoides*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.3	0 – 12	12.0	2 – 35
Hardwood	0.4	0 – 15	6.6	2 – 15
Regenerating or Shrubby Tree	0.0	0.0 – 3.0	3.0	1 – 5
Shrub	70.7	15.0 – 100.0	1.8	0 – 5
Herb	25.6	0 – 85	0.5	0 – 5

Local Membership Rule

In most stands, *Baccharis pilularis* dominates or co-dominates with *Frangula californica*, *Toxicodendron diversilobum*, and/or *Rubus* spp. in the shrub overstory. In some stands, *Frangula californica* or *Garrya elliptica* dominates, and is still keyed to this alliance. If *Calamagrostis nutkaensis* or *Carex obnupta* is co-dominant with *B. pilularis*, key to the *C. nutkaensis* Alliance. If stands have greater cover of *Artemisia californica*, *Ceanothus thyrsiflorus* or *Toxicodendron diversilobum* than *Baccharis pilularis*, key to those respective alliances. A variety of native and non-native forbs and grasses may intermix in the herbaceous layer, sometimes with higher cover than *Baccharis* – including *Avena*, *Bromus*, *Danthonia*, *Deschampsia*, *Elymus glaucus*, *Festuca*, *Hypochaeris*, *Nassella pulchra*, and others.

Local Environmental Description

Elevation: Mean 197 m, Range 7 – 549 m

Aspect: SW (32), NE (17), SE (15), NW (8), Flat (6), Variable (5), W (2)

Slope: Mean 15 degrees, Range 0 – 50 degrees

Macro Topography: Middle 1/3 of slope (17), Upper 1/3 of slope (15), Lower 1/3 of slope (11), Ridge top (9), Bench (8), Middle to Upper 1/3 of slope (4), Lower to

Middle 1/3 of slope (4), Bottom (3), Upper 1/3 of slope to Ridgetop (3), Draw (1), Bottom to Lower 1/3 of slope (1), Other (1), Terrace (former shoreline or floodplain) (1), Middle 1/3 of slope to Ridgetop (1), Entire slope (1)

Large Rock: Mean 0.8%, Range 0.0 – 52.2%

Small Rock: Mean 2.5%, Range 0.0 – 93.0%

Fines Cover: Mean 42.1%, Range 0.0 – 92.0%

Litter Cover: Mean 43.0%, Range 0.0 – 96%

Soil Texture (field assessed): Medium to very fine, sandy loam (14), Coarse, loamy sand (11), Not recorded (6), Moderately fine silty clay loam (6), Loam (class unknown) (6), Moderately coarse, sandy loam (6), Clay (class unknown) (6), Moderately fine sandy clay loam (5), Medium sand (4), Moderately fine clay loam (4), Sand (class unknown) (3), Medium silt loam (2), Medium loam (1), Fine sandy clay (1), Fine sand (1), Fine clay (1), Coarse sand (1), Medium to very fine, loamy sand (1)

Geology (field or map data): Sandstone and other sedimentary (65), Franciscan melange (31), Volcanic and metavolcanic rocks (28), Sandstone, shale, and conglomerate (19), Granitic (19), Sandstone (14), Granitic (generic) (8), Alluvium (6), Shale and other sedimentary (3), Sand dunes (2), Sedimentary (type unknown) (2), Greenstone (1), Metamorphic (type unknown) (1), Calcareous sandstone (1), Calcareous conglomerate (1), Sandstone, shale, and gravel deposits (1), Sandy alluvium (most alluvial fans and washes) (1), Chert (1)

San Mateo County Watersheds: Pescadero Creek (49), San Mateo Bayside (47), Pacifica (41), Ano Nuevo (31), San Francisco Coastal (19), Half Moon Bay (15), Tunitas Creek (3), Palo Alto (2)

Other Watersheds, San Francisco Co.: San Francisco Coastal (1)

Site Impacts

This alliance has low non-native plant cover (average 18.2%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira caryophyllea*, *Anagallis arvensis*, *Brachypodium distachyon*, *Briza minor*, *Bromus diandrus*, *Bromus hordeaceus*, *Cirsium vulgare*, *Conium maculatum*, *Geranium dissectum*, *Hypochaeris radicata*, *Plantago lanceolata*, *Rumex acetosella*, and *Vulpia bromoides*.

Associations in San Mateo County

- *Baccharis pilularis*
- *Baccharis pilularis* – (*Frangula californica*) – *Rubus* spp.
- *Baccharis pilularis* – *Artemisia californica*
- *Baccharis pilularis* – *Ceanothus thyrsiflorus*
- *Baccharis pilularis* – *Toxicodendron diversilobum*
- *Baccharis pilularis* / (*Nassella pulchra* – *Elymus glaucus* – *Bromus carinatus*)
- *Baccharis pilularis* / Annual Grass – Herb
- *Baccharis pilularis* / *Carex obnupta* – *Juncus patens*

Baccharis pilularis Shrubland Alliance

- *Baccharis pilularis* / *Danthonia californica*
- *Baccharis pilularis* / *Eriophyllum staechadifolium*
- *Frangula californica* ssp. *californica* – *Baccharis pilularis* / *Scrophularia californica* *Garrya elliptica*

Classification Comments

None.

References: AECOM 2013, Baxter 1992, Belsher 1999, Borchert et al. 2004, Buck-Diaz et al. 2012, Buck-Diaz et al. 2020, Elliott and Wehausen 1974, Evens and Kentner 2006, Evens and San 2004, Evens and San 2005, HDR 2014b, Keeler-Wolf and Evens 2006, Keeler-Wolf and Vaghti 2000, Keeler-Wolf et al. 2003a, Kittel et al. 2012, Klein et al. 2015, McBride and Stone 1976, O’Neil and Egan 2004, Parker 1974, Rodriguez et al. 2017, Sproul et al. 2011, Verdone and Evens 2010

Global Rarity Rank: G5

State Rarity Rank: S5

Surveys Used for Description

Total: N=235; San Mateo County (n=233): BOPO108, BOPO145A, BOPO148A, BOPO238, BOPO292, BOPO309, BOPO358, BOPO382, BOPO406A, BOPO430, BOPO473, BUTA006A, BUTA012A, BUTA031A, BUTA052, BUTA059A, CLOV138A, CLOV203, CLOV249, CLOV349A, CLOV395A, CLOV463, CLOV526A, CLOV569A, CORT041, CORT168, CPRAIR01, GGNRA259, GGNRA260, GGNRA264, GGNRA266, GGNRA312, GGNRA315, GGNRA319, GGNRA326, GGNRA333, GGNRA346, GGNRA347, GGNRA348, GGNRA351, GGNRA352, GGNRA355, GGNRA357, GGNRA359, GGNRA360, GGNRA363, GGNRA368, GGNRA372, GGNRA373, GGNRA374, GGNRA377, GGNRA380, GGNRA383, PGA1011A, PGA1014, PGA1033, PGA1039, PGA1040, PGA1042, PGA1047, PGA10907, PGA10950, PGA11185, PGA11188, PGA11191, PGA11193, PGA11195, PGA11306, PGA11328, PGA11333, PGA11334, PGA11388, PGA11393, PGA11413, PGA11467, PGA11856, PGA11988, PGA12048, PGA12103, PGA12169, PGA12657, PGA1744, PGA1752, PGA1754, PGA1760, PGA1767, PGA1768, PGA1769, PGA1771, PGA1773, PGA1778, PGA1786, PGA1787, PGA1798, PGA1799, PGA1802, PGA1803, PGA1807, PGA1809, PGA1811, PGA1812, PGA1821, PGA1826, PGA1828, PGA1831, PGA1839, PGA1845, PGA1848, PGA1850, PGA1853, PGA1854, PGA1855, PGA707, PGA711, PGA713, PGA715, PGA760, PGA904, PGA906, PGA913, PGA919, PGA921, PGA922, PGA923, PGA924, PGA934, PGA935, PGA943, PGA945, PGA951, PGA971, PGA975, PGA976, PGA982, PGA988, PGA991, PGA992, PGA994, PGA994A, PONU015, PWMIC03A, PWNCS01, PWNCS02, PWNCS03A, PWNMC01, SCLAR150, SCLAR155, SFANS08, SFANS09, SFANS11, SFANS12, SMAT0005, SMAT0010, SMAT0015, SMAT0017, SMAT0041, SMAT0069, SMAT0073, SMAT0086, SMAT0099, SMAT0104, SMAT0114, SMAT0120, SMAT0127, SMAT0140, SMAT0148, SMAT0149, SMAT0153, SMAT0175,

SMAT0274, SMAT0297, SMAT0314, SMAT0316, SMAT0317, SMAT0319, SMAT0320, SMAT0333, SMAT0641, SMAT0646, SMAT0660, SMAT0665, SMAT0674, SMAT0679, TOKA006, TOKA007A, TOKA013, TOKA016A, TOKA018, TOKA022, TOKA029A, TOKA030, TOKA041A, TOKA055, TOKA057, TOKA060, TOKA061A, TOKA067, TOKA080, TOKA089A, TOKA099A, TOKA104A, TOKA111A, TOKA115A, TOKA119, TOKA126, TOKA135, TOKA154A, TOKA169A, TOKA170B, TOTO010, TOTO022, TOTO028, TOTO033, TOTO051, TOTO054, WRBL002, WRBL041, WRBL047, WRBL048, WRBL050, WRBL061, WRBL062, WRBL067, WRBL070, WRBL106, WRBL110, WRBL111, WRBL112, WRBL113, WRBL114, WRBL118, WRBL119, YERBA00

San Francisco County (n=2): NONNAT28, SMAT0228

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	100.0	58.6	37.0	0.2	85	Y	Y		Y
	<i>Toxicodendron diversilobum</i>	78.7	12.5	10.1	0.158 3	62	Y			Y
	<i>Rubus ursinus</i>	77.4	8.3	5.9	0.2	65	Y			Y
	<i>Frangula californica</i>	57.4	7.4	5.7	0.2	70				Y
	<i>Diplacus aurantiacus</i>	39.1	2.2	1.6	0.2	30				
	<i>Artemisia californica</i>	25.1	3.9	3.1	0.2	52.042				
	Herb	<i>Anagallis arvensis</i>	47.7	1.0	0.3	0.2	8			
<i>Scrophularia californica</i>		43.0	8.1	1.7	0.125	35				
<i>Clinopodium douglasii</i>		41.3	4.3	0.8	0.2	25				
<i>Pteridium aquilinum</i>		39.1	5.4	0.8	0.2	20				
<i>Plantago lanceolata</i>		31.9	2.1	1.8	0.2	28.788				
<i>Vulpia bromoides</i>		31.5	3.2	2.9	0.2	43				
<i>Achillea millefolium</i>		29.4	0.6	0.3	0.2	10				
<i>Bromus hordeaceus</i>		28.9	1.1	0.9	0.2	17.436				
<i>Geranium dissectum</i>		28.5	0.5	0.5	0.2	7.1795				
<i>Aira caryophylla</i>		27.7	1.2	0.9	0.2	24.111				
<i>Sanicula crassicaulis</i>		27.7	1.6	0.5	0.125	35				
<i>Cirsium vulgare</i>		27.7	0.1	0.1	0.2	2.0243				
<i>Symphotrichum chilense</i>		27.2	1.3	0.6	0.2	25				
<i>Rumex acetosella</i>		26.0	0.9	0.6	0.2	35				
<i>Marah fabaceus</i>		26.0	3.0	0.5	0.2	23				
<i>Hypochaeris radicata</i>		25.5	0.6	0.5	0.2	14.451				

<i>unknown Poaceae</i>	23.8	2.5	1.6	0.2	65
<i>Brachypodium distachyon</i>	23.4	2.7	2.6	0.2	50
<i>Eriophyllum stoechadifolium</i>	23.4	4.1	1.5	0.2	38
<i>Conium maculatum</i>	22.6	1.9	0.7	0.2	28.409
<i>Danthonia californica</i>	22.1	3.1	2.5	0.2	49.388
<i>Bromus diandrus</i>	22.1	0.5	0.4	0.2	8.2051
<i>Briza minor</i>	22.1	0.3	0.2	0.2	10
<i>Polystichum munitum</i>	21.7	3.5	0.8	0.2	40
<i>Chlorogalum pomeridianum</i>	21.7	2.5	0.6	0.2	15
<i>Avena spp.</i>	21.3	2.0	1.3	0.2	70
<i>Heracleum maximum</i>	21.3	2.4	0.4	0.2	8
<i>Sisyrinchium bellum</i>	20.9	0.1	0.1	0.2	1.4085

***Baccharis pilularis* Association**

Common Name: Coyotebrush Shrubland Shrubland

Alliance: *Baccharis pilularis* Shrubland Alliance

Local Vegetation Description

The Coyotebrush Shrubland Association forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse, and the herbaceous layer is sparse to intermittent. Dominant and characteristic shrubs include *Baccharis pilularis*, and those that are often present include *Rubus ursinus* and *Toxicodendron diversilobum*. Herbs that are sometimes present include *Aira caryophyllea*, *Anagallis arvensis*, *Avena* spp., *Briza maxima*, *Bromus hordeaceus*, *Chlorogalum pomeridianum*, *Clinopodium douglasii*, *Elymus glaucus*, *Holcus lanatus*, *Juncus patens*, *Plantago lanceolata*, *Pteridium aquilinum*, and *Stachys ajugoides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	80.0	65.0 – 95.0	1.3	0.5 – 2
Herb	17.5	0 – 35	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 172 m, Range 55 – 289 m

Aspect: SW (1)

Slope: 14 degrees

Macro Topography: Upper 1/3 of slope (1)

Large Rock: 0/0%

Small Rock: 0.0%

Fines Cover: no data

Litter Cover: 0%

Soil Texture (field assessed): Medium to very fine, sandy loam (1)

Geology (field or map data): Sandstone and other sedimentary (2)

San Mateo County Watersheds: Half Moon Bay (1), Pacifica (1)

Site Impacts

This association has low non-native plant cover (average 9.3%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira caryophyllea*, *Anagallis arvensis*, *Avena* spp., *Briza maxima*, *Bromus hordeaceus*, *Holcus lanatus*, and *Plantago lanceolata*.

Classification Comments

None.

References: Borchert et al. 2004, Buck-Diaz et al. 2012, Keeler-Wolf and Evens 2006, Kittel et al. 2012, Rodriguez et al. 2017, Verdone and Evens 2010

Global Rarity Rank: G4

State Rarity Rank: SNR

State Rare: N

Surveys Used for Description

Total: N=3; San Mateo County (n=3): GGNRA352, PGA1033, PGA11193

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Eucalyptus globulus</i>	33.3	16.7	0.1	0.2	0.2				
	<i>Pinus radiata</i>	33.3	16.7	0.1	0.2	0.2				
Shrub	<i>Baccharis pilularis</i>	100.0	93.8	76.7	65	85		Y		Y
	<i>Rubus ursinus</i>	100.0	2.0	1.7	0.2	4				Y
	<i>Toxicodendron diversilobum</i>	66.7	1.5	1.4	0.2	4				Y
	<i>Frangula californica</i>	33.3	1.8	1.7	5	5				
	<i>Artemisia californica</i>	33.3	0.8	0.7	2.2	2.2				
	<i>Diplacus aurantiacus</i>	33.3	0.1	0.1	0.2	0.2				
Herb	<i>Chlorogalum pomeridianum</i>	66.7	33.7	1.7	0.2	5				Y
	unknown Poaceae	66.7	9.9	3.7	1	10				Y
	<i>Cortaderia jubata</i>	33.3	20.7	8.3	25	25				
	<i>Sanicula crassicaulis</i>	33.3	16.2	3.3	10	10				
	Forb (herbaceous, not grass nor grasslike)	33.3	4.1	1.7	5	5				
	<i>Nassella pulchra</i>	33.3	3.2	0.7	2	2				
	<i>Plantago lanceolata</i>	33.3	3.2	0.7	2	2				
	<i>Heracleum maximum</i>	33.3	0.3	0.1	0.2	0.2				
	<i>Danthonia californica</i>	33.3	0.3	0.1	0.2	0.2				
	<i>Conium maculatum</i>	33.3	0.3	0.1	0.2	0.2				
	<i>Clinopodium douglasii</i>	33.3	0.3	0.1	0.2	0.2				
	<i>Carduus pycnocephalus</i>	33.3	0.3	0.1	0.2	0.2				
	<i>Briza minor</i>	33.3	0.3	0.1	0.2	0.2				
	<i>Bromus hordeaceus</i>	33.3	0.3	0.1	0.2	0.2				

Baccharis pilularis Association
Baccharis pilularis Shrubland Alliance

<i>Artemisia douglasiana</i>	33.3	0.3	0.1	0.2	0.2
<i>unknown Apiaceae</i>	33.3	0.3	0.1	0.2	0.2
<i>Anagallis arvensis</i>	33.3	0.3	0.1	0.2	0.2
<i>Dichelostemma capitatum</i>	33.3	0.3	0.1	0.2	0.2
<i>Yabea microcarpa</i>	33.3	0.3	0.1	0.2	0.2
<i>Geranium dissectum</i>	33.3	0.3	0.1	0.2	0.2
<i>Hypochaeris radicata</i>	33.3	0.3	0.1	0.2	0.2
<i>Lolium perenne</i>	33.3	0.3	0.1	0.2	0.2
<i>Juncus patens</i>	33.3	0.3	0.1	0.2	0.2
<i>Marah fabaceus</i>	33.3	0.3	0.1	0.2	0.2
<i>Aira caryophyllea</i>	33.3	0.3	0.1	0.2	0.2
<i>Pseudognaphalium californicum</i>	33.3	0.3	0.1	0.2	0.2
<i>Euphorbia spp.</i>	33.3	0.3	0.1	0.2	0.2
<i>Stachys ajugoides</i>	33.3	0.3	0.1	0.2	0.2
<i>Sonchus oleraceus</i>	33.3	0.3	0.1	0.2	0.2
<i>Achillea millefolium</i>	33.3	0.3	0.1	0.2	0.2
<i>Rumex acetosella</i>	33.3	0.3	0.1	0.2	0.2
<i>Galium aparine</i>	33.3	0.3	0.1	0.2	0.2
<i>Erodium botrys</i>	33.3	0.3	0.1	0.2	0.2
<i>unknown</i>	33.3	0.3	0.1	0.2	0.2
<i>Convolvulaceae</i>	33.3	0.3	0.1	0.2	0.2
<i>Scrophularia californica</i>	33.3	0.2	0.1	0.2	0.2

***Baccharis pilularis* – (*Frangula californica*) – *Rubus* spp. Association**

Common Name: Coyote brush – coffeeberry – berry bramble Shrubland

Alliance: *Baccharis pilularis* Shrubland Alliance

Local Vegetation Description

The Coyote brush – coffeeberry – berry bramble Association forms an open to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is open to intermittent. Dominant and characteristic shrubs include *Baccharis pilularis*, *Rubus ursinus*, and *Toxicodendron diversilobum*, and those that are often present include *Frangula californica*. Commonly associated emergent trees at sparse cover include *Pseudotsuga menziesii*. Herbs that are often present include *Scrophularia californica*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.7	0 – 8	25.0	15 – 35
Hardwood	0.2	0 – 2	8.0	2 – 15
Regenerating or Shrubby Tree	0.0	0 – 0.4	3.5	2 – 5
Shrub	72.1	11 – 100	2.5	0.5 – 5
Herb	19.2	4 – 50	0.4	0 – 2

Local Environmental Description

Elevation: Mean 264 m, Range 28 – 549 m

Aspect: NE (6), SW (3), SE (2), Flat (1), NW (1)

Slope: Mean 16 degrees, Range 0 – 32 degrees

Macro Topography: Upper 1/3 of slope (3), Ridge top (2), Other (1), Upper 1/3 of slope to Ridgetop (1), Bench (1), Middle to Upper 1/3 of slope (1), Middle 1/3 of slope (1), Lower 1/3 of slope (1), Lower to Middle 1/3 of slope (1)

Large Rock: Mean 0.1%, Range 0.0 – 2.0%

Small Rock: Mean 1.3%, Range 0.0 – 30.0%

Fines Cover: Mean 45.7%, Range 1.0 – 68.8%

Litter Cover: Mean 50.5%, Range 5.0 – 96%

Soil Texture (field assessed): Medium to very fine, sandy loam (2), Moderately fine clay loam (2), Moderately fine sandy clay loam (2), Not recorded (2), Coarse, loamy sand (1), Loam, (class unknown) (1), Medium silt loam (1), Moderately coarse, sandy loam (1)

Geology (field or map data): Sandstone and other sedimentary (18), Granitic (6), Franciscan melange (5), Volcanic and metavolcanic rocks (4), Sandstone, shale, and conglomerate (4), Shale and other sedimentary (2), Calcareous conglomerate

Baccharis pilularis – (*Frangula californica*) – *Rubus* spp. Association
Baccharis pilularis Shrubland Alliance

(1), Greenstone (1), Alluvium (1), Sedimentary (type unknown) (1)

San Mateo County Watersheds: Palo Alto (1)

Site Impacts

This association has moderate non-native plant cover (average 24.8%) relative to native cover. Non- native species that occur with highest frequency and abundance include *Aira caryophyllea*, *Anagallis arvensis*, *Avena* spp., *Brachypodium distachyon*, *Briza minor*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Cirsium vulgare*, *Conium maculatum*, *Geranium dissectum*, *Holcus lanatus*, *Hypochaeris radicata*, *Linum bienne*, *Lolium perenne*, *Lotus corniculatus*, *Phalaris aquatica*, *Plantago lanceolata*, *Rumex acetosella*, *Sonchus asper*, *Trifolium angustifolium*, *Trifolium dubium*, *Vicia sativa*, *Vicia tetrasperma*, and *Vulpia bromoides*.

Classification Comments

This association definition has been revised to include the previously accepted *Baccharis pilularis* – *Rubus ursinus* / weedy herb Association from Point Reyes (Keeler-Wolf et al. 2003a).

References: Buck-Diaz et al. 2020, Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** N

Surveys Used for Description

Total: N=52; San Mateo County (n=52): BOPO145A, BOPO238, BOPO292, BOPO406A, CLOV203, CLOV249, CLOV463, CLOV526A, GGNRA264, GGNRA351, GGNRA355, GGNRA359, PGA1042, PGA10950, PGA11185, PGA11334, PGA11988, PGA12169, PGA1778, PGA1799, PGA1802, PGA1809, PGA1821, PGA1826, PGA1845, PGA1853, PGA943, PGA975, PGA976, PGA994A, SCLAR155, SMAT0005, SMAT0069, SMAT0086, SMAT0148, TOKA061A, TOKA080, TOKA089A, TOKA099A, TOKA104A, TOKA115A, TOKA119, TOKA169A, TOKA170B, TOTO022, TOTO028, TOTO051, TOTO054, WRBL061, WRBL106, WRBL110, YERBA00

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	C h	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	100.0	55.2	40.6	0.2	85		Y		Y
	<i>Rubus ursinus</i>	90.9	16.3	12.0	0.2	65				Y

Baccharis pilularis – (*Frangula californica*) – *Rubus* spp. Association
Baccharis pilularis Shrubland Alliance

<i>Toxicodendron diversilobum</i>	81.8	8.0	6.5	0.2	30	Y
<i>Frangula californica</i>	72.7	9.4	7.3	0.2	30	Y
<i>Diplacus aurantiacus</i>	32.7	0.9	0.7	0.2	10	
<i>Ceanothus thyrsiflorus</i>	21.8	0.8	0.8	0.2	15	

Herb

<i>Scrophularia californica</i>	60.0	13.1	1.8	0.2	15	Y
<i>Anagallis arvensis</i>	45.5	0.7	0.4	0.2	4.1096	
<i>Clinopodium douglasii</i>	40.0	5.0	1.3	0.2	25	
<i>Vulpia bromoides</i>	40.0	4.0	3.8	0.2	34.553	
<i>Plantago lanceolata</i>	40.0	2.3	2.2	0.2	16.279	
<i>Pteridium aquilinum</i>	38.2	5.0	0.8	0.2	8	
<i>Bromus hordeaceus</i>	38.2	1.5	1.3	0.2	8.7413	
<i>Geranium dissectum</i>	38.2	0.8	0.7	0.2	6.2176	
<i>Cirsium vulgare</i>	38.2	0.2	0.2	0.2	2.0243	
<i>Conium maculatum</i>	36.4	3.5	1.7	0.2	28.409	
<i>Hypochaeris radicata</i>	36.4	0.8	0.7	0.2	8.0745	
<i>Polystichum munitum</i>	34.5	8.6	2.2	0.2	40	
<i>Rumex acetosella</i>	34.5	2.2	1.4	0.2	35	
<i>Avena spp.</i>	34.5	1.3	1.0	0.2	15.385	
<i>Brachypodium distachyon</i>	30.9	3.7	3.4	0.339	36.458	
<i>Marah fabaceus</i>	30.9	2.8	0.3	0.2	5	
<i>Bromus diandrus</i>	30.9	0.8	0.6	0.2	6.6667	
<i>Vicia sativa</i>	30.9	0.1	0.1	0.2	1.2146	
<i>Holcus lanatus</i>	29.1	3.0	2.7	0.2	61.735	
<i>Aira caryophyllea</i>	29.1	1.4	1.3	0.2	24.111	
<i>Linum bienne</i>	29.1	1.0	1.0	0.2	7.265	
<i>Briza minor</i>	29.1	0.2	0.2	0.2	1.6949	
<i>unknown Poaceae</i>	27.3	1.4	1.4	0.5682	11.765	
<i>Symphyotrichum chilense</i>	27.3	1.0	0.5	0.2	12	
<i>Vicia tetrasperma</i>	27.3	0.9	0.8	0.2	10.959	
<i>Carduus pycnocephalus</i>	27.3	0.9	0.7	0.2	12.5	
<i>Sisyrinchium bellum</i>	27.3	0.1	0.1	0.2	0.6849	
<i>Heracleum maximum</i>	25.5	3.4	0.3	0.2	3	
<i>Danthonia californica</i>	25.5	1.2	1.1	0.2	13.953	
<i>Achillea millefolium</i>	25.5	0.4	0.2	0.2	2	
<i>Lolium perenne</i>	23.6	1.7	1.6	0.2	17.204	
<i>Sanicula crassicaulis</i>	23.6	1.0	0.3	0.2	10	
<i>Lotus corniculatus</i>	23.6	0.5	0.4	0.2	7.4576	
<i>Stachys ajugoides</i>	23.6	0.3	0.1	0.2	3	
<i>Trifolium dubium</i>	23.6	0.2	0.2	0.2	4.0486	
<i>Sonchus asper</i>	23.6	0.1	0.1	0.2	2.0243	
<i>Trifolium angustifolium</i>	21.8	0.1	0.1	0.2	2.439	

Baccharis pilularis – (*Frangula californica*) – *Rubus* spp. Association
Baccharis pilularis Shrubland Alliance

Baccharis pilularis – (*Frangula californica*) – *Rubus* spp. Association
Baccharis pilularis Shrubland Alliance

***Baccharis pilularis* – *Artemisia californica* Association**

Common Name: Coyote Brush – California Sagebrush Shrubland

Alliance: *Baccharis pilularis* Shrubland Alliance

Local Vegetation Description

The Coyote Brush – California Sagebrush Association forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse, and the herbaceous layer is sparse to intermittent. Dominant and characteristic shrubs include *Baccharis pilularis*, *Artemisia californica*, *Diplacus aurantiacus*, and *Toxicodendron diversilobum*, and those that are often present include *Frangula californica* and *Rubus ursinus*. Herbs that are sometimes present include *Anagallis arvensis*, *Chlorogalum pomeridianum*, *Clinopodium douglasii*, *Eriophyllum stoechadifolium*, *Monardella villosa*, *Pteridium aquilinum*, *Sanicula crassicaulis*, *Scrophularia californica*, and *Symphotrichum chilense*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.2	0 – 2	3.5	2 – 5
Hardwood	0.1	0 – 2	7.5	5 – 10
Regenerating or Shrubby Tree	0.0	0 – 0.2	no data	no data
Shrub	77.6	36.0 – 99.0	1.7	0.5 – 5
Herb	14.1	0 – 55	0.6	0 – 2

Local Environmental Description

Elevation: Mean 158 m, Range 15 – 351 m

Aspect: SE (6), SW (5), Variable (1)

Slope: Mean 22 degrees, Range 14 – 32 degrees

Macro Topography: Middle 1/3 of slope (4), Upper 1/3 of slope (3), Middle 1/3 of slope to Ridgetop (1)

Large Rock: Mean 0.9%, Range 0.0 – 4.0%

Small Rock: Mean 3.0%, Range 0.0 – 8.0%

Fines Cover: Mean 14.6%, Range 0.7 – 38.0%

Litter Cover: Mean 50.0%, Range 0.0 – 87%

Soil Texture (field assessed): Coarse, loamy sand (3), Clay, (class unknown) (2), Moderately fine clay loam (1), Moderately fine silty clay loam (1)

Geology (field or map data): Volcanic and metavolcanic rocks (5), Franciscan melange (4), Granitic (4), Sandstone and other sedimentary (2), Sandstone (1), Chert (1), Alluvium (1), Sandstone, shale, and conglomerate (1), Metamorphic (type unknown) (1)

San Mateo County Watersheds: Pacifica (8), San Francisco Coastal (4), San Mateo Bayside (4), Pescadero Creek (2), Ano Nuevo (1), Palo Alto (1)

Baccharis pilularis – *Artemisia californica* Association
Baccharis pilularis Shrubland Alliance

Site Impacts

This association has low non-native plant cover (average 4.5%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*.

Classification Comments

None.

References: AECOM 2013, Buck-Diaz and Evens 2015, Evens and Kentner 2006, Evens and San 2004, Keeler-Wolf and Evens 2006, Keeler-Wolf et al. 2003a, Kirkpatrick and Hutchinson 1977, Rodriguez et al. 2017, Stillwater Sciences and URS 2007, Verdone and Evens 2010

Global Rarity Rank: G5 **State Rarity Rank:** S5 **State Rare:** N

Surveys Used for Description

Total: N=24; San Mateo County (n=24): CORT168, GGNRA319, GGNRA347, PGA10907, PGA11188, PGA11191, PGA11333, PGA11393, PGA1752, PGA1754, PGA715, PGA906, PGA935, PGA994, PWNCS02, SCLAR150, SFANS08, SFANS09, SFANS11, SFANS12, SMAT0297, SMAT0333, WRBL047, WRBL113

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	100.0	48.3	42.6	17	77.91			Y	Y
	<i>Artemisia californica</i>	100.0	27.8	24.9	8	52.042				Y
	<i>Toxicodendron diversilobum</i>	91.7	10.5	8.7	0.1583	40				Y
	<i>Diplacus aurantiacus</i>	87.5	5.9	5.7	0.2	28.257				Y
	<i>Frangula californica</i>	70.8	1.8	1.5	0.2	10				Y
	<i>Rubus ursinus</i>	62.5	2.0	1.6	0.2	10				Y
	<i>Ceanothus thyrsiflorus</i>	29.2	0.6	0.6	0.2	10				
	Herb	<i>Anagallis arvensis</i>	41.7	3.0	0.3	0.2	2.8667			
<i>Eriophyllum stoechadifolium</i>		37.5	4.5	0.5	0.2	4				
<i>Pteridium aquilinum</i>		33.3	11.6	0.2	0.2	2				
<i>Scrophularia californica</i>		33.3	5.8	1.2	0.2	25				
<i>Clinopodium douglasii</i>		29.2	4.4	0.3	0.2	3				
<i>Monardella villosa</i>		25.0	6.6	0.8	0.2	5.5556				
<i>Symphotrichum chilense</i>		20.8	5.4	1.3	0.2	25				

Baccharis pilularis – *Artemisia californica* Association
Baccharis pilularis Shrubland Alliance

<i>Chlorogalum</i>	20.8	5.1	0.7	0.2	8
<i>pomeridianum</i>					
<i>Sanicula crassicaulis</i>	20.8	1.2	0.1	0.2	1

***Baccharis pilularis* – *Ceanothus thyrsiflorus* Association**

Common Name: Coyote Brush – Blueblossom Shrubland

Alliance: *Baccharis pilularis* Shrubland Alliance

Local Vegetation Description

The Coyote Brush – Blueblossom Association forms a continuous shrub layer. The emergent tree layer is typically absent, and the herbaceous layer is sparse to open. Dominant and characteristic shrubs include *Baccharis pilularis*, *Ceanothus thyrsiflorus*, *Rubus ursinus*, and *Toxicodendron diversilobum*, and those that are often present include *Frangula californica*. Herbs that are often present include *Anaphalis margaritacea* and *Clinopodium douglasii*, and herbs that are sometimes present include *Aira caryophylla*, *Anagallis arvensis*, *Bromus carinatus*, *Chlorogalum pomeridianum*, *Eriophyllum stoechadifolium*, *Marah fabaceus*, *Pseudognaphalium californicum*, *Pteridium aquilinum*, *Sanicula crassicaulis*, and *Scrophularia californica*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0.2	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	89.0	70.0 – 99.0	3.5	2 – 5
Herb	8.6	0 – 25	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 320 m, Range 288 – 358 m

Aspect: SW (3)

Slope: Mean 16 degrees, Range 11 – 24 degrees

Macro Topography: Upper 1/3 of slope (1), Bench (1), Entire slope (1)

Large Rock: Mean 4.7%, Range 0.0 – 14.0%

Small Rock: Mean 5.0%, Range 3.0 – 7.0%

Fines Cover: no data

Litter Cover: Mean 21.0%, Range 0.0 – 38%

Soil Texture (field assessed): Coarse, loamy sand (1), Medium to very fine, sandy loam (1), Moderately coarse, sandy loam (1)

Geology (field or map data): Franciscan melange (6), Sandstone, shale, and conglomerate (1)

San Mateo County Watersheds: San Mateo Bayside (3), San Francisco Coastal (2), Half Moon Bay (1), Pacifica (1)

Site Impacts

This association has very low non-native plant cover (average 0.3%) relative to native

Baccharis pilularis – *Ceanothus thyrsiflorus* Association
Baccharis pilularis Shrubland Alliance

cover. Non-native species that occur with highest frequency and abundance include *Aira caryophylla* and *Anagallis arvensis*.

Classification Comments

None.

References: Evens and Kentner 2006, Keeler-Wolf et al. 2003a

Global Rarity Rank: G3 **State Rarity Rank:** S3? **State Rare:** Y

Surveys Used for Description

Total: N=9; San Mateo County (n=9): GGNRA266, GGNRA368, GGNRA374, PGA11306, PGA11388, PGA1768, PGA1769, PGA1771, PGA707

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	100.0	56.1	54.6	35	83		Y		Y
	<i>Ceanothus thyrsiflorus</i>	100.0	21.6	21.2	10	40				Y
	<i>Toxicodendron diversilobum</i>	88.9	7.2	7.2	0.2	20				Y
	<i>Rubus ursinus</i>	77.8	5.4	6.6	0.2	35				Y
	<i>Frangula californica</i>	55.6	3.6	3.5	0.2	20				Y
	<i>Artemisia californica</i>	44.4	1.4	1.2	0.2	10				
	<i>Diplacus aurantiacus</i>	44.4	1.1	1.0	1	4				
	<i>Eriodictyon californicum</i>	22.2	0.0	0.0	0.2	0.2				
Herb	<i>Clinopodium douglasii</i>	55.6	12.3	1.4	0.2	4				Y
	<i>Anaphalis margaritacea</i>	55.6	8.7	0.9	0.2	5				Y
	<i>Eriophyllum stoechadifolium</i>	44.4	17.5	1.1	0.2	5				
	<i>Pteridium aquilinum</i>	44.4	13.8	0.9	0.2	5				
	<i>Scrophularia californica</i>	44.4	7.0	2.2	0.2	15				
	<i>Pseudognaphalium californicum</i>	33.3	8.4	0.5	0.2	3				
	<i>Chlorogalum pomeridianum</i>	33.3	2.9	0.4	0.2	2				
	<i>Aira caryophylla</i>	33.3	0.7	0.2	0.2	1				
	<i>Anagallis arvensis</i>	33.3	0.4	0.1	0.2	0.2				
	<i>Marah fabaceus</i>	22.2	8.7	2.6	1	22				
	<i>Sanicula crassicaulis</i>	22.2	0.5	0.1	0.2	1				
	<i>Bromus carinatus</i>	22.2	0.1	0.0	0.2	0.2				

Baccharis pilularis – *Ceanothus thyrsiflorus* Association
Baccharis pilularis Shrubland Alliance

***Baccharis pilularis* – *Toxicodendron diversilobum* Association**

Common Name: Coyote Brush – Poison Oak Shrubland

Alliance: *Baccharis pilularis* Shrubland Alliance

Local Vegetation Description

The Coyote Brush – Poison Oak Association forms an open to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is sparse to intermittent. Dominant and characteristic shrubs include *Baccharis pilularis*, *Rubus ursinus*, and *Toxicodendron diversilobum*, and those that are often present include *Frangula californica*. Herbs that are often present include *Clinopodium douglasii*, and herbs that are sometimes present include *Anagallis arvensis*, *Artemisia douglasiana*, *Chlorogalum pomeridianum*, *Cirsium vulgare*, *Conium maculatum*, *Geranium dissectum*, *Heracleum maximum*, *Marah fabaceus*, *Plantago lanceolata*, *Polystichum munitum*, *Pteridium aquilinum*, *Sanicula crassicaulis*, *Scrophularia californica*, and *Stachys ajugoides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.4	0 – 12	no data	no data
Hardwood	0.7	0 – 12	3.5	2 – 5
Regenerating or Shrubby Tree	0.0	0 – 1.0	no data	no data
Shrub	82.2	23.0 – 99.0	2.5	0 – 5
Herb	18.0	1 – 50	0.8	0 – 5

Local Environmental Description

Elevation: Mean 224 m, Range 7 – 492 m

Aspect: SW (5), NE (4), NW (3), SE (2)

Slope: Mean 15 degrees, Range 4 – 30 degrees

Macro Topography: Lower 1/3 of slope (4), Middle 1/3 of slope (4), Ridge top (2), Upper 1/3 of slope (2), Upper 1/3 of slope to Ridgetop (1), Bottom (1)

Large Rock: Mean 0.5%, Range 0.0 – 5.0%

Small Rock: Mean 7.0%, Range 0.0 – 93.0%

Fines Cover: Mean 49.1%, Range 0.0 – 73.5%

Litter Cover: Mean 27.7%, Range 0.0 – 75%

Soil Texture (field assessed): Medium to very fine, sandy loam (5), Moderately fine silty clay loam (3), Clay, (class unknown) (1), Fine sand (1), Fine sandy clay (1), Loam, (class unknown) (1), Medium loam (1), Moderately coarse, sandy loam (1)

Geology (field or map data): Franciscan melange (15), Sandstone and other sedimentary (14), Volcanic and metavolcanic rocks (13), Granitic (3), Sandstone, shale, and conglomerate (2), Sandstone (1), Sedimentary (type unknown) (1), Sand dunes (1)

Baccharis pilularis – *Toxicodendron diversilobum* Association
Baccharis pilularis Shrubland Alliance

San Mateo County Watersheds: San Mateo Bayside (27), Pescadero Creek (9), Half Moon Bay (4), Pacifica (4), San Francisco Coastal (4), Ano Nuevo (3)

Site Impacts

This association has low non-native plant cover (average 8.4%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Cirsium vulgare*, *Conium maculatum*, *Geranium dissectum*, and *Plantago lanceolata*.

Classification Comments

None.

References: Belsher 1999, Evens and Kentner 2006, Keeler-Wolf et al. 2003a, Klein et al. 2015, McBride and Stone 1976, O’Neil and Egan 2004

Global Rarity Rank: G5 **State Rarity Rank:** S5? **State Rare:** N

Surveys Used for Description

Total: N=57; San Mateo County (n=57): BOPO108, CLOV349A, CPRAIR01, GGNRA312, GGNRA315, GGNRA346, GGNRA348, GGNRA360, GGNRA363, GGNRA373, GGNRA377, GGNRA380, GGNRA383, PGA1039, PGA11195, PGA11328, PGA11413, PGA11467, PGA11856, PGA12103, PGA12657, PGA1767, PGA1773, PGA1787, PGA1798, PGA1803, PGA1807, PGA1811, PGA1812, PGA1839, PGA711, PGA713, PGA760, PGA904, PGA913, PGA919, PGA921, PGA922, PGA923, PGA924, PGA934, PGA951, PGA971, PGA988, PGA992, PWNCS03A, SMAT0641, SMAT0646, TOKA013, TOKA018, TOKA029A, TOKA060, TOKA067, TOKA135, TOKA154A, WRBL050, WRBL062

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	100.0	50.4	44.0	7	80		Y		Y
	<i>Toxicodendron diversilobum</i>	100.0	29.2	26.0	6	62				Y
	<i>Rubus ursinus</i>	80.7	8.1	7.5	0.2	35				Y
	<i>Frangula californica</i>	57.9	3.8	3.4	0.2	25				Y
	<i>Diplacus aurantiacus</i>	38.6	2.7	2.3	0.2	30				
	Herb	<i>Clinopodium douglasii</i>	57.9	7.7	0.8	0.2	10			
<i>Pteridium aquilinum</i>		45.6	7.2	0.9	0.2	7				
<i>Sanicula crassicaulis</i>		42.1	4.1	1.4	0.125	35				

Baccharis pilularis – *Toxicodendron diversilobum* Association
Baccharis pilularis Shrubland Alliance

<i>Scrophularia californica</i>	40.4	10.1	1.8	0.125	20.2
<i>Marah fabaceus</i>	40.4	6.6	1.2	0.2	23
<i>Heracleum maximum</i>	38.6	4.9	0.9	0.2	8
<i>Anagallis arvensis</i>	36.8	1.0	0.2	0.2	4
<i>Chlorogalum</i>					
<i>pomeridianum</i>	29.8	4.0	0.9	0.2	15
<i>Cirsium vulgare</i>	26.3	0.2	0.1	0.2	1
<i>Artemisia douglasiana</i>	24.6	3.4	0.7	0.2	15
<i>Polystichum munitum</i>	24.6	2.2	0.5	0.2	8
<i>Conium maculatum</i>	22.8	1.6	0.4	0.2	15
<i>Plantago lanceolata</i>	22.8	1.4	1.3	0.2	22.941
<i>Geranium dissectum</i>	22.8	0.6	0.4	0.2	6.1321
<i>Stachys ajugoides</i>	22.8	0.4	0.1	0.125	1

***Baccharis pilularis* / (*Nassella pulchra* – *Elymus glaucus* – *Bromus carinatus*) Association**

Common Name: *Baccharis pilularis* / mixed native grassland Shrubland

Alliance: *Baccharis pilularis* Shrubland Alliance

Local Vegetation Description

The *Baccharis pilularis* / mixed native grassland Association forms an open to intermittent shrub layer. The emergent tree layer is typically absent, and the herbaceous layer is open to continuous. Dominant and characteristic shrubs include *Baccharis pilularis* with *Toxicodendron diversilobum*, and those that are often present include *Artemisia californica*, *Diplacus aurantiacus*, and *Rubus ursinus*. Commonly associated emergent trees at sparse cover include *Quercus agrifolia*. The herbaceous layer typically includes *Aira caryophyllea*, *Anagallis arvensis*, *Bromus hordeaceus*, and *Plantago lanceolata*, and herbs that are often present include *Anaphalis margaritacea*, *Bromus carinatus*, *Chlorogalum pomeridianum*, *Cirsium vulgare*, *Clinopodium douglasii*, *Hypochaeris radicata*, *Nassella pulchra*, *Rumex acetosella*, and *Vulpia bromoides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.2	0 – 1	3.5	2 – 5
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	41.0	22.0 – 50.0	0.3	0 – 0.5
Herb	44.6	25 – 75	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 179 m, Range 75 – 319 m

Aspect: NW (1), SE (1)

Slope: Mean 9 degrees, Range 9 – 9 degrees

Macro Topography: Upper 1/3 of slope (1), Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: Mean 0.3%, Range 0.0 – 1.0%

Fines Cover: Mean 31.7%, Range 0.2 – 64.0%

Litter Cover: Mean 46.0%, Range 0.2 – 93%

Soil Texture (field assessed): Not recorded (1)

Geology (field or map data): Sandstone and other sedimentary (3), Volcanic and metavolcanic rocks (2), Sandstone, shale, and conglomerate (1), Shale and other sedimentary (1), Franciscan melange (1)

San Mateo County Watersheds: San Mateo Bayside (5), Pescadero Creek (2), San Francisco Coastal (1)

Baccharis pilularis / (*Nassella pulchra* – *Elymus glaucus* – *Bromus carinatus*) Association
Baccharis pilularis Shrubland Alliance

Site Impacts

This association has moderate non-native plant cover (average 31.4%) relative to native cover. Non- native species that occur with highest frequency and abundance include *Aira caryophylla*, *Anagallis arvensis*, *Avena* spp., *Bellardia trixago*, *Brachypodium distachyon*, *Briza maxima*, *Briza minor*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Cirsium vulgare*, *Conium maculatum*, *Dipsacus* spp., *Geranium dissectum*, *Hypochaeris radicata*, *Linum bienne*, *Lolium perenne* , *Lotus corniculatus*, *Phalaris aquatica*, *Plantago lanceolata*, *Rumex acetosella*, *Sonchus asper*, *Trifolium angustifolium*, *Trifolium dubium*, *Vicia tetrasperma*, *Vicia villosa*, *Vulpia bromoides*, and *Vulpia myuros*.

Classification Comments

None.

References: Evens and Kentner 2006, Keeler-Wolf et al. 2003a, Klein et al. 2015, Rodriguez et al. 2017

Global Rarity Rank: G3 **State Rarity Rank:** S3 **State Rare:** Y

Surveys Used for Description

Total: N=8; San Mateo County (n=8): CORT041, PGA1850, PGA1854, PGA1855, PWMIC03A, SMAT0679, TOKA030, TOKA041A

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	37.5	31.3	0.2	0.2	1				
Shrub	<i>Baccharis pilularis</i>	100.0	69.2	26. 7	12	45		Y		Y
	<i>Toxicodendron diversilobum</i>	75.0	8.6	3.5	1	10				Y
	<i>Artemisia californica</i>	50.0	7.6	3.0	1	10				Y
	<i>Diplacus aurantiacus</i>	50.0	3.9	1.8	0.2	10				Y
	<i>Rubus ursinus</i>	50.0	2.2	0.9	0.2	3				Y
	<i>Frangula californica</i>	25.0	0.2	0.1	0.2	0.2				
Herb	<i>Anagallis arvensis</i>	87.5	0.6	0.4	0.2	1.6667				Y
	<i>Bromus hordeaceus</i>	75.0	3.4	2.7	0.2	15				Y
	<i>Aira caryophylla</i>	75.0	2.8	1.7	0.2	10				Y
	<i>Plantago lanceolata</i>	75.0	2.3	2.1	0.2	6.25				Y
	<i>Nassella pulchra</i>	62.5	18.3	14.	0.2	39				Y

Baccharis pilularis / (*Nassella pulchra* – *Elymus glaucus* – *Bromus carinatus*) Association
Baccharis pilularis Shrubland Alliance

				3			
<i>Vulpia bromoides</i>	62.5	6.4	7.8	0.2	43		Y
<i>Bromus carinatus</i>	62.5	3.6	3.4	0.2	14.884		Y
<i>Clinopodium douglasii</i>	62.5	0.8	0.4	0.2	2		Y
<i>Chlorogalum pomeridianum</i>	50.0	2.6	0.7	0.2	3		Y
<i>Anaphalis margaritacea</i>	50.0	1.6	1.0	0.2	6		Y
<i>Hypochaeris radicata</i>	50.0	0.4	0.3	0.2	1.6667		Y
<i>Cirsium vulgare</i>	50.0	0.4	0.2	0.2	0.9302		Y
<i>Rumex acetosella</i>	50.0	0.2	0.2	0.2	0.8333		Y
<i>Lolium perenne</i>	37.5	2.4	3.2	0.2	22		
<i>Brachypodium distachyon</i>	37.5	2.2	2.0	0.2	15		
<i>Briza minor</i>	37.5	1.8	1.3	0.2	10		
<i>Avena spp.</i>	37.5	1.4	1.9	0.2	14		
<i>Carduus pycnocephalus</i>	37.5	0.5	0.4	0.2	2.7907		
<i>Achillea millefolium</i>	37.5	0.4	0.2	0.2	1		
<i>Sonchus asper</i>	37.5	0.3	0.2	0.2	1.25		
<i>Monardella villosa</i>	37.5	0.2	0.1	0.2	0.2		
<i>Elymus glaucus</i>	37.5	0.1	0.1	0.2	0.2		
<i>Briza maxima</i>	25.0	12.8	6.9	20	35		
<i>Nassella lepida</i>	25.0	6.6	1.6	$\frac{2.916}{7}$	10		
unknown Poaceae	25.0	2.4	2.2	$\frac{2.790}{7}$	14.583		
<i>Conium maculatum</i>	25.0	1.4	1.2	1.25	8.3721		
<i>Phalaris aquatica</i>	25.0	1.3	1.1	0.2	8.3721		
<i>Vicia tetrasperma</i>	25.0	1.2	1.0	$\frac{3.255}{8}$	5		
<i>Geranium dissectum</i>	25.0	1.0	0.9	1.25	5.5814		
<i>Linum bienne</i>	25.0	1.0	0.9	$\frac{1.395}{3}$	5.8333		
<i>Plantago erecta</i>	25.0	0.7	0.4	$\frac{0.833}{3}$	2		
<i>Bromus diandrus</i>	25.0	0.5	0.7	$\frac{1.395}{3}$	4		
<i>Dipsacus spp.</i>	25.0	0.4	0.3	0.2	2		
<i>Pseudognaphalium californicum</i>	25.0	0.4	0.2	0.2	1		
<i>Eriogonum latifolium</i>	25.0	0.4	0.5	0.2	4		
<i>Juncus spp.</i>	25.0	0.4	0.3	0.2	2.3256		
<i>Vulpia myuros</i>	25.0	0.3	0.3	0.2	2		
<i>Pseudognaphalium spp.</i>	25.0	0.3	0.2	0.2	1.6667		
<i>Trifolium dubium</i>	25.0	0.2	0.1	0.2	0.8333		
<i>Sanicula crassicaulis</i>	25.0	0.2	0.1	0.2	0.4651		
<i>Galium californicum</i>	25.0	0.2	0.1	0.2	0.2		
<i>Castilleja affinis</i>	25.0	0.2	0.1	0.2	0.2		

Baccharis pilularis / (*Nassella pulchra* – *Elymus glaucus* – *Bromus carinatus*) Association
Baccharis pilularis Shrubland Alliance

<i>Triteleia laxa</i>	25.0	0.2	0.1	0.2	0.2
<i>Danthonia californica</i>	25.0	0.2	0.1	0.2	0.4167
<i>Scrophularia californica</i>	25.0	0.2	0.1	0.2	0.9302
<i>Daucus pusillus</i>	25.0	0.2	0.1	0.2	0.8333
<i>Stachys spp.</i>	25.0	0.2	0.1	0.2	0.2
<i>Gamochaeta ustulata</i>	25.0	0.2	0.1	0.2	0.2
<i>Lotus corniculatus</i>	25.0	0.1	0.1	$\frac{0.416}{7}$	0.4651
<i>Pteridium aquilinum</i>	25.0	0.1	0.1	0.2	0.2
<i>Trifolium angustifolium</i>	25.0	0.1	0.1	0.2	0.4167
<i>Madia exigua</i>	25.0	0.1	0.1	0.2	0.2
<i>Pseudognaphalium ramosissimum</i>	25.0	0.1	0.1	0.2	0.2
<i>Eschscholzia californica</i>	25.0	0.1	0.1	0.2	0.4167
<i>Marah fabaceus</i>	25.0	0.1	0.1	0.2	0.2
<i>Symphyotrichum chilense</i>	25.0	0.1	0.1	0.2	0.2
<i>Sisyrinchium bellum</i>	25.0	0.1	0.1	0.2	0.2
<i>Vicia villosa</i>	25.0	0.1	0.1	0.2	0.2
<i>Artemisia douglasiana</i>	25.0	0.1	0.1	0.2	0.2
<i>Bellardia trixago</i>	25.0	0.1	0.1	0.2	0.2

Layer	Taxon	Co n	Rel	Av g	Min	Ma x	Ch	D	cD	Off
	<i>Briza maxima</i>	25	12.8	6.9	20.0	35.0				
	unknown Poaceae	25	2.4	2.2	2.8	14.6				
	<i>Nassella lepida</i>	25	6.6	1.6	2.9	10.0				
	<i>Conium maculatum</i>	25	1.4	1.2	1.3	8.4				
	<i>Phalaris aquatica</i>	25	1.3	1.1	0.2	8.4				
	<i>Vicia tetrasperma</i>	25	1.2	1.0	3.3	5.0				
	<i>Linum bienne</i>	25	1.0	0.9	1.4	5.8				
	<i>Geranium dissectum</i>	25	1.0	0.9	1.3	5.6				
	<i>Bromus diandrus</i>	25	0.5	0.7	1.4	4.0				
	<i>Eriogonum latifolium</i>	25	0.4	0.5	0.2	4.0				
	<i>Plantago erecta</i>	25	0.7	0.4	0.8	2.0				
	<i>Juncus</i> spp.	25	0.4	0.3	0.2	2.3				
	<i>Dipsacus</i> spp.	25	0.4	0.3	0.2	2.0				
	<i>Vulpia myuros</i>	25	0.3	0.3	0.2	2.0				
	<i>Pseudognaphalium</i>	25	0.3	0.2	0.2	1.7				
	<i>Pseudognaphalium californicum</i>	25	0.4	0.2	0.2	1.0				
	<i>Scrophularia californica</i>	25	0.2	0.1	0.2	0.9				
	<i>Daucus pusillus</i>	25	0.2	0.1	0.2	0.8				
	<i>Trifolium dubium</i>	25	0.2	0.1	0.2	0.8				
	<i>Lotus corniculatus</i>	25	0.1	0.1	0.4	0.5				
	<i>Sanicula crassicaulis</i>	25	0.2	0.1	0.2	0.5				
	<i>Danthonia californica</i>	25	0.2	0.1	0.2	0.4				
	<i>Eschscholzia californica</i>	25	0.1	0.1	0.2	0.4				
	<i>Trifolium angustifolium</i>	25	0.1	0.1	0.2	0.4				
	<i>Artemisia douglasiana</i>	25	0.1	0.1	0.2	0.2				
	<i>Bellardia trixago</i>	25	0.1	0.1	0.2	0.2				
	<i>Castilleja affinis</i>	25	0.2	0.1	0.2	0.2				
	<i>Galium californicum</i>	25	0.2	0.1	0.2	0.2				
	<i>Gamochaeta ustulata</i>	25	0.2	0.1	0.2	0.2				
	<i>Madia exigua</i>	25	0.1	0.1	0.2	0.2				
	<i>Marah fabaceus</i>	25	0.1	0.1	0.2	0.2				
	<i>Pseudognaphalium ramosissimum</i>	25	0.1	0.1	0.2	0.2				
	<i>Pteridium aquilinum</i>	25	0.1	0.1	0.2	0.2				
	<i>Sisyrinchium bellum</i>	25	0.1	0.1	0.2	0.2				
	<i>Stachys</i> spp.	25	0.2	0.1	0.2	0.2				
	<i>Symphyotrichum</i>	25	0.1	0.1	0.2	0.2				

Baccharis pilularis / (*Nassella pulchra* – *Elymus glaucus* – *Bromus carinatus*) Association
Baccharis pilularis Shrubland Alliance

chilense

Triteleia laxa

25 0.2 0.1 0.2 0.2

Vicia villosa

25 0.1 0.1 0.2 0.2

***Baccharis pilularis* / Annual grass – herb Association**

Common Name: Coyote Brush / Annual Grass-Herb Shrubland

Alliance: *Baccharis pilularis* Shrubland Alliance

Local Vegetation Description

The Coyote Brush / Annual Grass-Herb Association forms an open to intermittent shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is intermittent to continuous. Dominant and characteristic shrubs include *Baccharis pilularis* with *Rubus ursinus*, and those that are often present include *Toxicodendron diversilobum*. Commonly associated emergent trees at sparse cover include *Quercus agrifolia*. The herbaceous layer typically includes *Anagallis arvensis* and *Avena* spp., and herbs that are often present include *Brachypodium distachyon*, *Briza minor*, *Bromus diandrus*, *Bromus hordeaceus*, *Cirsium vulgare*, *Geranium dissectum*, *Lotus corniculatus*, *Phalaris aquatica*, *Plantago lanceolata*, *Sisyrinchium bellum*, *Vicia sativa*, and *Vulpia bromoides*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	2.5	0 – 5	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	32.5	15.0 – 50.0	1.9	0 – 5
Herb	65.0	45 – 85	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 147 m, Range 66 – 366 m

Aspect: SW (1)

Slope: Mean 18 degrees, Range 15 – 20 degrees

Macro Topography: Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: Mean 0.1%, Range 0.0 – 1.0%

Fines Cover: Mean 50.4%, Range 5.0 – 70.4%

Litter Cover: Mean 38.7%, Range 1.0 – 50.9%

Soil Texture (field assessed): Moderately fine silty clay loam (1)

Geology (field or map data): Sandstone and other sedimentary (10), Sandstone, shale, and gravel deposits (1), Volcanic and metavolcanic rocks (1), Sandstone, shale, and conglomerate (1), Alluvium (1)

San Mateo County Watersheds: Pescadero Creek (8), Ano Nuevo (2), San Mateo Bayside (2), San Francisco Coastal (1), Tunitas Creek (1)

Site Impacts

Baccharis pilularis / Annual grass – herb Association
Baccharis pilularis Shrubland Alliance

This association has greater cover of exotics (average 66.6%) than natives. Non-native species that occur with highest frequency and abundance include *Aira caryophylla*, *Anagallis arvensis*, *Avena* spp., *Brachypodium distachyon*, *Briza minor*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Cirsium vulgare*, *Conium maculatum*, *Dactylis glomerata*, *Geranium dissectum*, *Holcus lanatus*, *Hypochaeris glabra*, *Hypochaeris radicata*, *Linum bienne*, *Linum usitatissimum*, *Lolium perenne*, *Lotus corniculatus*, *Medicago* spp., *Phalaris aquatica*, *Plantago lanceolata*, *Rumex acetosella*, *Sonchus asper*, *Trifolium angustifolium*, *Trifolium dubium*, *Vicia sativa*, *Vicia tetrasperma*, *Vulpia bromoides*, and *Vulpia myuros*.

Classification Comments

Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: AECOM 2013, Evens and San 2004, Evens and San 2005, HDR 2014b, Keeler-Wolf and Evens 2006, Keeler-Wolf and Vaghti 2000, Keeler-Wolf et al. 2003a, Kittel et al. 2012, Klein et al. 2015, Rodriguez et al. 2017, Sproul et al. 2011

Global Rarity Rank: G5 **State Rarity Rank:** S5 **State Rare:** N

Surveys Used for Description

Total: N=15; San Mateo County (n=14): BOPO309, BOPO430, CLOV395A, GGNRA333, PGA1047, PGA1760, PONU015, TOKA006, TOKA016A, TOKA022, TOKA055, TOKA057, TOKA111A, TOKA126

San Francisco County (n=1): NONNAT28

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	26.7	26.7	0.4	1	2				
Shrub	<i>Baccharis pilularis</i>	100.0	76.6	18.7	6	51	Y			Y
	<i>Rubus ursinus</i>	80.0	6.8	1.3	0.2	5				Y
	<i>Toxicodendron diversilobum</i>	73.3	9.5	2.9	1	20				Y
	<i>Diplacus aurantiacus</i>	26.7	2.8	0.5	0.4	5				
	<i>Frangula californica</i>	26.7	2.2	0.6	1	5				
Herb	<i>Anagallis arvensis</i>	86.7	0.7	0.6	0.2	2.4735				Y
	<i>Avena</i> spp.	80.0	15.7	12.2	0.2	70				Y
	<i>Bromus hordeaceus</i>	73.3	4.2	3.8	0.2	17.436				Y
	<i>Geranium dissectum</i>	73.3	1.6	1.5	0.2	7.1795				Y

Baccharis pilularis / Annual grass – herb Association
Baccharis pilularis Shrubland Alliance

<i>Sisyrinchium bellum</i>	73.3	0.2	0.2	0.2	0.7576	Y
<i>Vulpia bromoides</i>	66.7	12.5	12.1	2.290 1	30.435	Y
<i>Brachypodium distachyon</i>	60.0	9.9	9.4	0.2	29.707	Y
<i>Plantago lanceolata</i>	60.0	4.8	4.7	0.2	28.788	Y
<i>Briza minor</i>	60.0	1.4	0.9	0.2	7	Y
<i>Cirsium vulgare</i>	60.0	0.2	0.2	0.2	0.939	Y
<i>Phalaris aquatica</i>	53.3	4.3	4.2	0.2	45.652	Y
unknown <i>Poaceae</i>	53.3	3.1	3.1	0.512 8	13.074	Y
<i>Bromus diandrus</i>	53.3	1.9	1.8	0.2	8.2051	Y
<i>Lotus corniculatus</i>	53.3	1.2	1.2	0.2	7.5145	Y
<i>Vicia sativa</i>	53.3	0.6	0.6	0.2	4.8913	Y
<i>Lolium perenne</i>	46.7	4.5	4.2	0.706 7	22.901	
<i>Aira caryophyllea</i>	46.7	2.2	1.4	0.2	10	
<i>Hypochaeris radicata</i>	46.7	1.7	1.6	0.2	14.451	
<i>Rumex acetosella</i>	46.7	1.4	1.3	0.2	12.721	
<i>Trifolium angustifolium</i>	46.7	0.8	0.8	0.2	6.8182	
<i>Linum bienne</i>	40.0	0.9	0.9	0.706 7	6.1538	
<i>Danthonia californica</i>	40.0	0.9	0.9	0.2	4.3478	
<i>Trifolium dubium</i>	40.0	0.8	0.7	0.2	6.1069	
<i>Conium maculatum</i>	40.0	0.5	0.5	0.2	6	
<i>Eschscholzia californica</i>	40.0	0.4	0.4	0.2	2.2901	
<i>Achillea millefolium</i>	40.0	0.3	0.5	0.2	6	
<i>Hypochaeris glabra</i>	33.3	1.0	1.0	0.2	5	
<i>Vulpia myuros</i>	33.3	0.9	1.2	0.418 4	14	
<i>Nassella pulchra</i>	33.3	0.9	0.8	0.2	7.9498	
<i>Vicia tetrasperma</i>	33.3	0.8	0.8	0.543 5	3.9216	
<i>Pteridium aquilinum</i>	33.3	0.2	0.2	0.2	1.4085	
<i>Dactylis glomerata</i>	33.3	0.1	0.1	0.2	1.087	
<i>Camissonia ovata</i>	33.3	0.1	0.1	0.2	0.2	
<i>Carduus pycnocephalus</i>	26.7	2.1	2.0	3.589 7	13.587	
<i>Holcus lanatus</i>	26.7	1.1	1.1	1	10.329	
<i>Calystegia purpurata</i>	26.7	0.8	1.2	0.2	17	
<i>Linum usitatissimum</i>	26.7	0.7	0.7	0.418 4	7.5	
unknown <i>Asteraceae</i>	26.7	0.4	0.4	0.2	2.3474	
<i>Clinopodium douglasii</i>	26.7	0.4	0.2	0.2	2	

Baccharis pilularis / Annual grass – herb Association
Baccharis pilularis Shrubland Alliance

<i>Bromus carinatus</i>	26.7	0.3	0.4	0.512 8	3
<i>Sanicula crassicaulis</i>	26.7	0.1	0.1	0.2	1
<i>Medicago spp.</i>	26.7	0.1	0.1	0.2	0.7634
<i>Symphyotrichum chilense</i>	26.7	0.1	0.1	0.2	0.4695
<i>Sonchus asper</i>	26.7	0.1	0.1	0.2	0.2

***Baccharis pilularis* / *Carex obnupta* – *Juncus patens* Provisional Association**

Common Name: Coyote Brush / Slough Sedge – Common Rush Shrubland

Alliance: *Baccharis pilularis* Shrubland Alliance

Local Vegetation Description

The Coyote Brush / Slough Sedge – Common Rush Association forms an open to intermittent shrub layer. The emergent tree layer is typically absent, and the herbaceous layer is open to continuous. Dominant and characteristic shrubs include *Baccharis pilularis* with *Rubus ursinus*. The herbaceous layer typically includes *Juncus patens*, and herbs that are often present include *Carex obnupta* and *Holcus lanatus*. Herbs that are sometimes present include *Achillea millefolium*, *Carex* spp., *Cirsium vulgare*, *Conium maculatum*, *Iris douglasiana*, *Juncus effusus*, *Lolium perenne*, and *Plantago lanceolata*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	36.3	15.0 – 65.0	0.4	0 – 1
Herb	45.0	15 – 70	0.5	0 – 1

Local Environmental Description

Elevation: Mean 36 m, Range 16 – 55 m

Aspect: SW (3), SE (1)

Slope: Mean 8 degrees, Range 3 – 17 degrees

Macro Topography: Lower 1/3 of slope (1), Lower to Middle 1/3 of slope (1), Middle to Upper 1/3 of slope (1), Upper 1/3 of slope to Ridgetop (1)

Large Rock: Mean 0.0%, Range 0.0 – 0.0%

Small Rock: Mean 0.1%, Range 0.0 – 0.2%

Fines Cover: Mean 28.0%, Range 10.0 – 57.0%

Litter Cover: Mean 69.0%, Range 40.0 – 87%

Soil Texture (field assessed): Coarse, loamy sand (2), Medium sand (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Sandstone (4)

San Mateo County Watersheds: Pescadero Creek (4)

Site Impacts

This association has low non-native plant cover (average 5.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Cirsium*

Baccharis pilularis / *Carex obnupta* – *Juncus patens* Provisional Association
Baccharis pilularis Shrubland Alliance

vulgare, *Conium maculatum*, *Holcus lanatus*, *Lolium perenne*, and *Plantago lanceolata*.

Classification Comments

This association is considered provisional since it is under-sampled in its expected range.

References: Keeler-Wolf et al. 2003a

Global Rarity Rank: G3

State Rarity Rank: S3?

State Rare: Y

Surveys Used for Description

Total: N=4; San Mateo County (n=4): SMAT0175, SMAT0314, SMAT0317, SMAT0320

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	100.0	99.1	34.5	15	58			Y	Y
	<i>Rubus ursinus</i>	25.0	0.8	0.5	2	2				
	<i>Diplacus aurantiacus</i>	25.0	0.1	0.1	0.2	0.2				
Herb	<i>Juncus patens</i>	100.0	12.1	6.1	0.2	20				Y
	<i>Achillea millefolium</i>	100.0	1.2	0.6	0.2	1				Y
	<i>Vulpia bromoides</i>	75.0	1.3	0.8	0.2	2				Y
	<i>Iris douglasiana</i>	50.0	36.1	22.5	35	55				Y
	<i>Anagallis arvensis</i>	50.0	4.2	2.1	0.2	8				Y
	<i>Eriophyllum stoechadifolium</i>	50.0	3.5	1.8	2	5				Y
	<i>Chlorogalum pomeridianum</i>	50.0	2.3	1.3	1	4				Y
	<i>Fragaria chiloensis</i>	50.0	1.1	0.6	0.2	2				Y
	<i>Potentilla glandulosa</i>	50.0	0.9	0.5	1	1				Y
	<i>Centaureum muehlenbergii</i>	50.0	0.6	0.3	0.2	1				Y
	<i>Symphyotrichum chilense</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Lythrum hyssopifolium</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Aira caryophyllea</i>	50.0	0.2	0.1	0.2	0.2				Y
	unknown Poaceae	50.0	0.2	0.1	0.2	0.2				Y
	<i>Gamochaeta ustulata</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Carex obnupta</i>	25.0	23.4	12.5	50	50				

Baccharis pilularis / *Carex obnupta* – *Juncus patens* Provisional Association
Baccharis pilularis Shrubland Alliance

<i>Galium aparine</i>	25.0	2.0	1.0	4	4	
<i>Plantago lanceolata</i>	25.0	1.7	1.3	5	5	
<i>Scrophularia californica</i>	25.0	1.5	0.8	3	3	
<i>Clinopodium douglasii</i>	25.0	1.5	0.8	3	3	
<i>Grindelia stricta</i>	25.0	1.5	0.8	3	3	
<i>Fragaria vesca</i>	25.0	1.0	0.8	3	3	
<i>Erigeron glaucus</i>	25.0	1.0	0.5	2	2	
<i>Carex harfordii</i>	25.0	0.3	0.3	1	1	
<i>Elymus spp.</i>	25.0	0.1	0.1	0.2	0.2	
<i>Heracleum maximum</i>	25.0	0.1	0.1	0.2	0.2	
<i>Euphorbia peplus</i>	25.0	0.1	0.1	0.2	0.2	
<i>Sonchus asper</i>	25.0	0.1	0.1	0.2	0.2	
<i>Geranium dissectum</i>	25.0	0.1	0.1	0.2	0.2	
<i>Helenium puberulum</i>	25.0	0.1	0.1	0.2	0.2	
<i>Lotus corniculatus</i>	25.0	0.1	0.1	0.2	0.2	
<i>Castilleja affinis</i>	25.0	0.1	0.1	0.2	0.2	
<i>Dudleya farinosa</i>	25.0	0.1	0.1	0.2	0.2	
<i>Carex brevicaulis</i>	25.0	0.1	0.1	0.2	0.2	
<i>Juncus arcticus</i>	25.0	0.1	0.1	0.2	0.2	
<i>Carpobrotus edulis</i>	25.0	0.1	0.1	0.2	0.2	
<i>Eriogonum latifolium</i>	25.0	0.1	0.1	0.2	0.2	
<i>Distichlis spicata</i>	25.0	0.1	0.1	0.2	0.2	
<i>Castilleja spp.</i>	25.0	0.1	0.1	0.2	0.2	
<i>Bromus diandrus</i>	25.0	0.1	0.1	0.2	0.2	
<i>Rumex acetosella</i>	25.0	0.1	0.1	0.2	0.2	
<i>Dryopteris arguta</i>	25.0	0.1	0.1	0.2	0.2	
<i>Briza maxima</i>	25.0	0.1	0.1	0.2	0.2	
<i>Lupinus spp.</i>	25.0	0.1	0.1	0.2	0.2	
<i>Pentagramma triangularis</i>	25.0	0.1	0.1	0.2	0.2	
<i>Hypochaeris radicata</i>	25.0	0.1	0.1	0.2	0.2	
<i>Bromus hordeaceus</i>	25.0	0.1	0.1	0.2	0.2	
Non-Vascular						
Moss	50.0	50.0	0.1	0.2	0.2	Y

Layer	Taxon	Co n	Rel	Avg	Min	Max	Ch	D	cD	Of
	<i>Geranium dissectum</i>	25	0.1	0.1	0.2	0.2				
	<i>Helenium puberulum</i>	25	0.1	0.1	0.2	0.2				
	<i>Heracleum maximum</i>	25	0.1	0.1	0.2	0.2				
	<i>Hypochaeris radicata</i>	25	0.1	0.1	0.2	0.2				
	<i>Juncus arcticus</i>	25	0.1	0.1	0.2	0.2				
	<i>Lotus corniculatus</i>	25	0.1	0.1	0.2	0.2				
	<i>Lupinus</i> spp.	25	0.1	0.1	0.2	0.2				
	<i>Pentagramma triangularis</i>	25	0.1	0.1	0.2	0.2				
	<i>Rumex acetosella</i>	25	0.1	0.1	0.2	0.2				
	<i>Sonchus asper</i>	25	0.1	0.1	0.2	0.2				
Non-vascular										
	Moss	50	50. 0	0.1	0.2	0.2				X

***Baccharis pilularis* / *Danthonia californica* Association**

Common Name: Coyote Brush / California Oatgrass Shrubland

Alliance: *Baccharis pilularis* Shrubland Alliance

Local Vegetation Description

The Coyote Brush / California Oatgrass Association forms an open to intermittent shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is intermittent to continuous. Dominant and characteristic shrubs include *Baccharis pilularis* with *Rubus ursinus*, and those that are often present include *Frangula californica* and *Toxicodendron diversilobum*. Commonly associated emergent trees at sparse cover include *Pseudotsuga menziesii*. The herbaceous layer typically includes *Danthonia californica*, *Aira caryophyllea*, *Brachypodium distachyon*, and *Plantago lanceolata*, and herbs that are often present include *Anagallis arvensis*, *Briza minor*, *Bromus hordeaceus*, *Camissonia ovata*, *Cirsium vulgare*, *Geranium dissectum*, *Holcus lanatus*, *Hypochaeris radicata*, *Juncus patens*, *Linum bienne*, *Lotus corniculatus*, *Pteridium aquilinum*, *Rumex acetosella*, *Sisyrinchium bellum*, *Symphotrichum chilense*, *Trifolium angustifolium*, *Vicia sativa*, *Vicia tetrasperma*, and *Vulpia bromoides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	2.4	0 – 15	no data	no data
Hardwood	0.0	0 – 1	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	35.1	15.2 – 64.0	1.4	0 – 5
Herb	62.5	50 – 80	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 87 m, Range 27 – 182 m

Aspect: SW (2), W (1)

Slope: 3 degrees (1)

Macro Topography: Bench (2), Ridge top (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 57.5%, Range 50.3 – 72.8%

Litter Cover: Mean 42.4%, Range 27.2 – 49.7%

Soil Texture (field assessed): Clay, (class unknown) (3)

Geology (field or map data): Sandstone and other sedimentary (7), Sandstone, shale, and conglomerate (7), Alluvium (2)

San Mateo County Watersheds: Ano Nuevo (9), Pescadero Creek (6), San Mateo Bayside (1)

Site Impacts

This association has moderate non-native plant cover (average 38.1%) relative to native cover. Non- native species that occur with highest frequency and abundance include *Aira caryophylla*, *Anagallis arvensis*, *Avena* spp., *Brachypodium distachyon*, *Briza maxima*, *Briza minor*, *Bromus diandrus*, *Bromus hordeaceus*, *Cirsium vulgare*, *Conium maculatum*, *Cortaderia seloana*, *Dactylis glomerata*, *Geranium dissectum*, *Holcus lanatus*, *Hypochaeris radicata*, *Linum bienne*, *Linum usitatissimum*, *Lolium perenne*, *Lotus corniculatus*, *Myosotis discolor*, *Phalaris aquatica*, *Plantago lanceolata*, *Romulea rosea*, *Rumex acetosella*, *Rytidosperma pilosum*, *Sonchus asper*, *Trifolium angustifolium*, *Trifolium dubium*, *Trifolium subterraneum*, *Vicia sativa*, *Vicia tetrasperma*, and *Vulpia bromoides*.

Classification Comments

None.

References: Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: G2 **State Rarity Rank:** S2 **State Rare:** Y

Surveys Used for Description

Total: N=18; San Mateo County (n=18): BOPO148A, BOPO358, BOPO382, BOPO473, BUTA006A, BUTA012A, BUTA031A, BUTA052, BUTA059A, CLOV138A, CLOV569A, PGA1040, TOKA007A, TOTO010, TOTO033, WRBL112, WRBL114, WRBL119

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Pseudotsuga menziesii</i>	27.8	25.0	1.9	1	15				
Shrub	<i>Baccharis pilularis</i>	100.0	72.8	25.3	10	40		Y		Y
	<i>Rubus ursinus</i>	94.4	9.4	2.8	0.2	7				Y
	<i>Toxicodendron diversilobum</i>	72.2	7.5	2.5	1	7				Y
	<i>Fragula californica</i>	72.2	3.1	0.9	0.2	3				Y
	<i>Holodiscus discolor</i>	22.2	4.8	2.8	1	20				
Herb	<i>Danthonia californica</i>	100.0	33.5	26.5	2.7027	49.388			Y	Y
	<i>Plantago lanceolata</i>	77.8	6.5	6.5	0.2	17.561				Y
	<i>Aira caryophylla</i>	77.8	3.8	3.5	0.8264	21.012				Y
	<i>Brachypodium</i>	77.8	3.2	3.2	0.2	19.886				Y

Baccharis pilularis / *Danthonia californica* Association
Baccharis pilularis Shrubland Alliance

<i>distachyon</i>						
<i>Holcus lanatus</i>	72.2	4.8	4.8	0.5682	17.021	Y
<i>Vulpia bromoides</i>	66.7	7.9	7.9	2.1622	30.579	Y
<i>Bromus hordeaceus</i>	66.7	1.9	1.9	0.2	9.0909	Y
<i>Anagallis arvensis</i>	66.7	0.4	0.4	0.2	1.6529	Y
<i>Cirsium vulgare</i>	66.7	0.2	0.2	0.2	0.6849	Y
<i>unknown Poaceae</i>	61.1	7.6	6.6	1.1673	65	Y
<i>Geranium dissectum</i>	61.1	0.7	0.7	0.2	2.5105	Y
<i>Symphyotrichum chilense</i>	61.1	0.3	0.3	0.2	2.1622	Y
<i>Sisyrinchium bellum</i>	61.1	0.2	0.2	0.2	1.1673	Y
<i>Linum bienne</i>	55.6	1.6	1.6	0.8264	7.1918	Y
<i>Hypochaeris radicata</i>	55.6	1.4	1.4	0.6024	5.5319	Y
<i>Vicia tetrasperma</i>	55.6	1.0	1.0	0.2	6.2762	Y
<i>Rumex acetosella</i>	55.6	0.8	0.8	0.2	3.7433	Y
<i>Lotus corniculatus</i>	55.6	0.6	0.6	0.2	2.9289	Y
<i>Briza minor</i>	55.6	0.4	0.4	0.2	1.6216	Y
<i>Vicia sativa</i>	55.6	0.4	0.4	0.2	1.7123	Y
<i>Pteridium aquilinum</i>	50.0	0.6	0.6	0.2	6.9519	Y
<i>Trifolium angustifolium</i>	50.0	0.4	0.4	0.2	2.4096	Y
<i>Juncus patens</i>	50.0	0.3	0.3	0.2	1.2048	Y
<i>Camissonia ovata</i>	50.0	0.1	0.1	0.2	0.3891	Y
<i>Bromus diandrus</i>	44.4	0.4	0.4	0.2	2.0921	
<i>Trifolium dubium</i>	38.9	0.2	0.2	0.2	0.8511	
<i>Juncus occidentalis</i>	38.9	0.2	0.2	0.2	0.8511	
<i>Sanicula crassicaulis</i>	38.9	0.1	0.1	0.2	1.0274	
<i>Achillea millefolium</i>	38.9	0.1	0.1	0.2	0.8511	
<i>Sonchus asper</i>	38.9	0.1	0.1	0.2	0.8511	
<i>Phalaris aquatica</i>	33.3	0.4	0.4	0.2	4.9587	
<i>Fragaria vesca</i>	33.3	0.3	0.3	0.2	2.6738	
<i>Romulea rosea</i>	33.3	0.3	0.3	0.2	3.1128	
<i>Clinopodium douglasii</i>	33.3	0.3	0.3	0.2	2.5105	
<i>Iris douglasiana</i>	33.3	0.2	0.2	0.2	2.6738	
<i>Myosotis discolor</i>	33.3	0.1	0.1	0.2	0.4255	
<i>Gamochaeta ustulata</i>	33.3	0.1	0.1	0.2	0.2	
<i>Briza maxima</i>	27.8	5.7	5.7	0.2	43.784	
<i>Luzula comosa</i>	27.8	1.2	0.6	0.8511	3	
<i>Elymus glaucus</i>	27.8	0.5	0.4	0.2	3	
<i>Carex harfordii</i>	27.8	0.1	0.1	0.2	1.0695	
<i>Carex tumulicola</i>	27.8	0.1	0.1	0.2	0.6849	
<i>Bromus carinatus</i>	27.8	0.1	0.1	0.2	0.5682	
<i>Carex subfusca</i>	27.8	0.1	0.1	0.2	0.4255	
<i>Artemisia douglasiana</i>	27.8	0.1	0.1	0.2	0.3891	

Baccharis pilularis / *Danthonia californica* Association
Baccharis pilularis Shrubland Alliance

<i>Polystichum munitum</i>	27.8	0.1	0.1	0.2	0.2
<i>Prunella vulgaris</i>	27.8	0.1	0.1	0.2	0.2
<i>Lolium perenne</i>	22.2	1.4	1.4	1.7123	15.909
<i>Dactylis glomerata</i>	22.2	0.7	0.7	0.2	11.446
<i>Avena spp.</i>	22.2	0.6	0.6	0.2	9.0909
<i>Rytidosperma pilosum</i>	22.2	0.4	0.4	0.2	5.9459
<i>Linum usitatissimum</i>	22.2	0.3	0.3	0.2	2.8409
<i>Cortaderia selloana</i>	22.2	0.3	0.3	0.2	3.3058
<i>Conium maculatum</i>	22.2	0.2	0.2	0.2	2.9289
<i>Trifolium subterraneum</i>	22.2	0.1	0.1	0.2	1.2552
<i>Juncus effusus</i>	22.2	0.1	0.1	0.2	0.8368
<i>Horkelia californica</i>	22.2	0.1	0.1	0.2	0.5348
<i>Pentagramma triangularis</i>	22.2	0.0	0.0	0.2	0.2
<i>Eschscholzia californica</i>	22.2	0.0	0.0	0.2	0.2
Non-Vascular					
Moss	27.8	27.8	0.2	0.3891	1.8072

Layer	Taxon	Co n	Rel	Avg	Min	Max	Ch	D	cD	Oft
	<i>Camissonia ovata</i>	50	0.1	0.1	0.2	0.4				X
	<i>Bromus diandrus</i>	44	0.4	0.4	0.2	2.1				
	<i>Trifolium dubium</i>	39	0.2	0.2	0.2	0.9				
	<i>Juncus occidentalis</i>	39	0.2	0.2	0.2	0.9				
	<i>Sanicula crassicaulis</i>	39	0.1	0.1	0.2	1.0				
	<i>Achillea millefolium</i>	39	0.1	0.1	0.2	0.9				
	<i>Sonchus asper</i>	39	0.1	0.1	0.2	0.9				
	<i>Phalaris aquatica</i>	33	0.4	0.4	0.2	5.0				
	<i>Romulea rosea</i>	33	0.3	0.3	0.2	3.1				
	<i>Fragaria vesca</i>	33	0.3	0.3	0.2	2.7				
	<i>Clinopodium douglasii</i>	33	0.3	0.3	0.2	2.5				
	<i>Iris douglasiana</i>	33	0.2	0.2	0.2	2.7				
	<i>Myosotis discolor</i>	33	0.1	0.1	0.2	0.4				
	<i>Gamochaeta ustulata</i>	33	0.1	0.1	0.2	0.2				
	<i>Briza maxima</i>	28	5.7	5.7	0.2	43.8				
	<i>Luzula comosa</i>	28	1.2	0.6	0.9	3.0				
	<i>Elymus glaucus</i>	28	0.5	0.4	0.2	3.0				
	<i>Carex harfordii</i>	28	0.1	0.1	0.2	1.1				
	<i>Bromus carinatus</i>	28	0.1	0.1	0.2	0.6				
	<i>Carex tumulicola</i>	28	0.1	0.1	0.2	0.7				
	<i>Carex subfusca</i>	28	0.1	0.1	0.2	0.4				
	<i>Artemisia douglasiana</i>	28	0.1	0.1	0.2	0.4				
	<i>Polystichum munitum</i>	28	0.1	0.1	0.2	0.2				
	<i>Prunella vulgaris</i>	28	0.1	0.1	0.2	0.2				
	<i>Lolium perenne</i>	22	1.4	1.4	1.7	15.9				
	<i>Dactylis glomerata</i>	22	0.7	0.7	0.2	11.4				
	<i>Avena</i> spp.	22	0.6	0.6	0.2	9.1				
	<i>Rytidosperma pilosum</i>	22	0.4	0.4	0.2	5.9				
	<i>Linum usitatissimum</i>	22	0.3	0.3	0.2	2.8				
	<i>Cortaderia selloana</i>	22	0.3	0.3	0.2	3.3				
	<i>Conium maculatum</i>	22	0.2	0.2	0.2	2.9				
	<i>Trifolium subterraneum</i>	22	0.1	0.1	0.2	1.3				
	<i>Juncus effusus</i>	22	0.1	0.1	0.2	0.8				
	<i>Horkelia californica</i>	22	0.1	0.1	0.2	0.5				
	<i>Eschscholzia californica</i>	22	0.0	0.0	0.2	0.2				
	<i>Pentagramma triangularis</i>	22	0.0	0.0	0.2	0.2				
Non-vascular										
	Moss	28	27.	0.2	0.4	1.8				

Baccharis pilularis / *Danthonia californica* Association
Baccharis pilularis Shrubland Alliance

***Baccharis pilularis* / *Eriophyllum staechadifolium* Association**

Common Name: Coyote Brush / Seaside Woolly-sunflower Shrubland

Alliance: *Baccharis pilularis* Shrubland Alliance

Local Vegetation Description

The Coyote Brush / Seaside Woolly-sunflower Association forms an open to continuous shrub layer. The emergent tree layer is typically absent, and the herbaceous layer is open to continuous. Dominant and characteristic shrubs include *Baccharis pilularis*, and those that are often present include *Rubus ursinus*. The herbaceous layer typically includes *Eriophyllum staechadifolium* and *Achillea millefolium*, and herbs that are often present include *Erigeron glaucus*, *Eriogonum latifolium*, *Fragaria chiloensis*, and *Scrophularia californica*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	57.2	20.0 – 90.0	0.6	0 – 2
Herb	34.8	5 – 70	0.3	0 – 1

Local Environmental Description

Elevation: Mean 53 m, Range 7 – 367 m

Aspect: SW (6), Variable (3), NE (3), NW (1), Flat (1), SE (1)

Slope: Mean 13 degrees, Range 0 – 38 degrees

Macro Topography: Bench (4), Upper 1/3 of slope (3), Lower 1/3 of slope (2), Middle 1/3 of slope (2), Bottom to Lower 1/3 of slope (1), Lower to Middle 1/3 of slope (1), Ridge top (1), Terrace (former shoreline or floodplain) (1)

Large Rock: Mean 0.6%, Range 0.0 – 6.0%

Small Rock: Mean 3.0%, Range 0.0 – 20.0%

Fines Cover: Mean 53.6%, Range 8.0 – 92.0%

Litter Cover: Mean 33.2%, Range 0.0 – 90%

Soil Texture (field assessed): Loam, (class unknown) (4), Medium to very fine, sandy loam (2), Sand, (class unknown) (2), Not recorded (2), Moderately fine sandy clay loam (1), Medium sand (1), Fine clay (1), Coarse, loamy sand (1), Moderately fine clay loam (1)

Geology (field or map data): Sandstone and other sedimentary (7), Sandstone (3), Alluvium (1), Calcareous sandstone (1), Granitic (generic) (1), Sand dunes (1), Volcanic and metavolcanic rocks (1)

San Mateo County Watersheds: Pacifica (7), Ano Nuevo (3), Pescadero Creek (3), Tunitas Creek (2), San Francisco Coastal (1)

Baccharis pilularis / *Eriophyllum staechadifolium* Association
Baccharis pilularis Shrubland Alliance

Other Watersheds, San Francisco Co.: San Francisco Coastal (1)

Site Impacts

This association has low non-native plant cover (average 5.6%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Bromus diandrus*, *Carpobrotus edulis*, *Geranium dissectum*, *Hypochaeris radicata*, *Plantago coronopus*, *Plantago lanceolata*, *Rumex acetosella*, and *Vulpia bromoides*.

Classification Comments

Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Baxter 1992, Belsher 1999, Keeler-Wolf et al. 2003a

Global Rarity Rank: G3 **State Rarity Rank:** S3 **State Rare:** Y

Surveys Used for Description

Total: N=19; San Mateo County (n=18): GGNRA259, GGNRA260, PGA12048, PGA1786, PGA1848, PWNCS01, SMAT0015, SMAT0041, SMAT0104, SMAT0120, SMAT0660, SMAT0665, WRBL002, WRBL041, WRBL048, WRBL067, WRBL070, WRBL118

San Francisco County (n=1): SMAT0228

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	100.0	82.1	34.1	16	55		Y		Y
	<i>Rubus ursinus</i>	52.6	4.4	2.1	0.2	20				Y
	<i>Artemisia californica</i>	42.1	5.3	2.3	0.2	20				
	<i>Diplacus aurantiacus</i>	36.8	1.9	1.0	0.2	10				
	<i>Lupinus versicolor</i>	36.8	0.6	0.3	0.2	3				
Herb	<i>Eriophyllum stoechadifolium</i>	100.0	31.7	15.4	0.2	38			Y	Y
	<i>Achillea millefolium</i>	78.9	3.5	1.9	0.2	10				Y
	<i>Erigeron glaucus</i>	68.4	1.7	1.0	0.2	4.1				Y
	<i>Scrophularia californica</i>	57.9	3.5	2.2	0.2	30				Y
	<i>Eriogonum latifolium</i>	57.9	2.8	1.4	0.2	10				Y
	<i>Fragaria chiloensis</i>	52.6	10.8	7.4	0.2	55				Y
	<i>Symphyotrichum chilense</i>	47.4	2.2	1.4	0.5	10				

Baccharis pilularis / *Eriophyllum stoechadifolium* Association
Baccharis pilularis Shrubland Alliance

<i>Dudleya farinosa</i>	47.4	0.7	0.3	0.2	2
<i>Castilleja affinis</i>	42.1	0.8	0.7	0.2	7
<i>Anagallis arvensis</i>	42.1	0.2	0.1	0.2	0.5
<i>Chlorogalum pomeridianum</i>	36.8	2.1	1.4	0.2	15
<i>Carpobrotus edulis</i>	36.8	2.0	0.9	0.5	10
<i>Daucus pusillus</i>	36.8	0.2	0.1	0.2	0.5
<i>Pteridium aquilinum</i>	31.6	1.9	1.6	0.2	20
<i>Angelica hendersonii</i>	31.6	1.9	1.2	0.2	7
<i>Clinopodium douglasii</i>	31.6	1.9	1.7	0.2	25
<i>Plantago lanceolata</i>	31.6	0.3	0.2	0.2	3
<i>Gamochaeta ustulata</i>	31.6	0.2	0.1	0.2	0.5
<i>Armeria maritima</i>	26.3	1.9	2.2	0.2	40
<i>Vulpia bromoides</i>	26.3	0.9	0.4	0.2	5
<i>Bromus maritimus</i>	26.3	0.6	0.3	0.2	3
<i>Pterostegia drymarioides</i>	26.3	0.4	0.1	0.2	1
<i>Rumex acetosella</i>	26.3	0.3	0.3	0.2	3.4
<i>Grindelia stricta</i>	26.3	0.3	0.1	0.2	1
<i>Plantago coronopus</i>	26.3	0.2	0.2	0.2	2
<i>Galium aparine</i>	26.3	0.2	0.1	0.2	1.1
<i>Geranium dissectum</i>	26.3	0.2	0.1	0.2	0.5
<i>Lotus wrangelianus</i>	26.3	0.1	0.1	0.2	0.5
<i>Claytonia perfoliata</i>	21.1	1.0	0.2	0.2	3
<i>Iris douglasiana</i>	21.1	0.6	0.4	0.2	3
<i>Hypochaeris radicata</i>	21.1	0.4	0.3	0.2	5
<i>Carex brevicaulis</i>	21.1	0.3	0.2	0.2	3
<i>Sidalcea malviflora</i>	21.1	0.3	0.2	0.2	2
<i>Bromus diandrus</i>	21.1	0.1	0.1	0.2	0.5
<i>Sanicula crassicaulis</i>	21.1	0.1	0.1	0.2	0.5

***Frangula californica* ssp. *californica* – *Baccharis pilularis* / *Scrophularia californica* Association**

Common Name: Coffeeberry – Coyote Brush / California Figwort Shrubland

Alliance: *Baccharis pilularis* Shrubland Alliance

Local Vegetation Description

The Coffeeberry – Coyote Brush / California Figwort Association forms an open to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is open to continuous. Dominant and characteristic shrubs include *Frangula californica*, *Baccharis pilularis*, *Rubus ursinus*, and *Toxicodendron diversilobum*. The herbaceous layer typically includes *Scrophularia californica*, and herbs that are often present include *Pteridium aquilinum*. Herbs that are sometimes present include *Anagallis arvensis*, *Artemisia douglasiana*, *Clinopodium douglasii*, *Conium maculatum*, *Dryopteris arguta*, *Galium aparine*, *Heracleum maximum*, *Marah* spp., *Marah fabaceus*, *Phacelia californica*, *Polystichum munitum*, *Rumex acetosella*, *Sonchus asper*, *Stachys ajugoides*, and *Urtica dioica*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.2	0 – 2	7.5	5 – 10
Hardwood	1.7	0 – 15	no data	no data
Regenerating or Shrubby Tree	0.2	0 – 3.0	2.8	1 – 5
Shrub	74.5	30.0 – 95.0	2.3	1 – 5
Herb	32.0	8 – 70	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 306 m, Range 10 – 543 m

Aspect: SW (2), NE (2), W (1), SE (1), NW (1), Flat (1), Variable (1)

Slope: Mean 15 degrees, Range 0 – 50 degrees

Macro Topography: Middle 1/3 of slope (4), Ridge top (2), Draw (1), Lower 1/3 of slope (1), Lower to Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: Mean 2.4%, Range 0.0 – 11.0%

Fines Cover: Mean 24.0%, Range 5.0 – 79.0%

Litter Cover: Mean 50.8%, Range 0.0 – 92%

Soil Texture (field assessed): Medium to very fine, sandy loam (3), Moderately coarse, sandy loam (3), Moderately fine silty clay loam (1), Moderately fine sandy clay loam (1), Medium silt loam (1), Not recorded (1)

Geology (field or map data): Granitic (5), Granitic (generic) (3), Sandstone (2), Sandstone, shale, and conglomerate (2), Sandstone and other sedimentary (1), Volcanic and metavolcanic rocks (1)

San Mateo County Watersheds: Pacifica (6), Half Moon Bay (4), Ano Nuevo (3), San Mateo Bayside (1)

Site Impacts

This association has low non-native plant cover (average 10.3%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Conium maculatum*, *Rumex acetosella*, and *Sonchus asper*.

Classification Comments

This association has been moved from its original placement in a Coffeeberry Alliance.

References: Keeler-Wolf et al. 2003a

Global Rarity Rank: G4 **State Rarity Rank:** S4 **State Rare:** N

Surveys Used for Description

Total: N=14; San Mateo County (n=14): GGNRA326, GGNRA357, GGNRA372, PGA1011A, PGA1014, PGA1828, PGA991, PWNMC01, SMAT0010, SMAT0114, SMAT0140, SMAT0149, SMAT0153, WRBL111

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Frangula californica</i>	100.0	58.5	45.4	25	70		Y		Y
	<i>Baccharis pilularis</i>	100.0	23.3	21.0	0.2	45				Y
	<i>Toxicodendron diversilobum</i>	78.6	9.3	8.2	0.2	35				Y
	<i>Rubus ursinus</i>	78.6	5.6	5.0	0.2	20				Y
	<i>Diplacus aurantiacus</i>	28.6	0.8	0.7	0.2	5				
	<i>Rubus parviflorus</i>	28.6	0.7	0.9	0.2	10				
	<i>Ribes sanguineum</i>	21.4	0.1	0.1	0.2	0.4				
Herb	<i>Scrophularia californica</i>	78.6	22.1	7.3	0.2	35				Y
	<i>Pteridium aquilinum</i>	64.3	8.1	1.9	0.2	10				Y
	<i>Stachys ajugoides</i>	42.9	8.0	2.7	0.2	30				
	<i>Urtica dioica</i>	42.9	7.9	2.8	0.2	15				
	<i>Marah fabaceus</i>	42.9	2.2	0.8	0.2	5				
	<i>Clinopodium douglasii</i>	42.9	1.1	0.3	0.2	3				
	<i>Heracleum</i>	35.7	5.2	1.1	0.2	8				

Frangula californica ssp. *californica* – *Baccharis pilularis* / *Scrophularia californica* Association
Baccharis pilularis Shrubland Alliance

<i>maximum</i>					
<i>Dryopteris arguta</i>	35.7	2.6	0.9	0.2	10
<i>Anagallis arvensis</i>	35.7	0.4	0.1	0.2	1
<i>Conium maculatum</i>	21.4	3.5	1.2	0.2	15
<i>Rumex acetosella</i>	21.4	1.8	1.5	0.2	20
<i>Polystichum munitum</i>	21.4	1.6	0.5	0.2	5
<i>Phacelia californica</i>	21.4	0.6	0.1	0.2	1
<i>Artemisia douglasiana</i>	21.4	0.3	0.1	0.2	1
<i>Marah spp.</i>	21.4	0.2	0.0	0.2	0.2
<i>Sonchus asper</i>	21.4	0.2	0.0	0.2	0.2
<i>Galium aparine</i>	21.4	0.1	0.0	0.2	0.2

***Garrya elliptica* Provisional Association**

Common Name: Coast silk tassel Shrubland

Alliance: *Baccharis pilularis* Shrubland Alliance

Local Vegetation Description

The Coast silk tassel Association forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is open to intermittent. Dominant and characteristic shrubs include *Garrya elliptica*, *Baccharis pilularis*, and *Toxicodendron diversilobum*, and those that are often present include *Artemisia californica*, *Frangula californica*, and *Holodiscus discolor*. The herbaceous layer typically includes *Polystichum munitum* and *Pteridium aquilinum*, and herbs that are sometimes present include *Monardella villosa*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	1.0	0 – 5	12.5	10 – 15
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	70.0	55.0 – 85.0	3.5	2 – 5
Herb	18.0	5 – 45	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 177 m, Range 18 – 543 m

Aspect: NW (1), SE (1)

Slope: Mean 33 degrees, Range 30 – 35 degrees

Macro Topography: Middle to Upper 1/3 of slope (1), Upper 1/3 of slope (1)

Large Rock: Mean 3.1%, Range 1.2 – 5.0%

Small Rock: Mean 9.1%, Range 8.0 – 10.2%

Fines Cover: Mean 38.5%, Range 10.0 – 67.0%

Litter Cover: Mean 47.5%, Range 15.0 – 80%

Soil Texture (field assessed): Coarse, loamy sand (1), Medium sand (1)

Geology (field or map data): Granitic (3), Granitic (generic) (2)

San Mateo County Watersheds: Pacifica (2)

Other Watersheds, Marin Co.: Inverness (3)

Site Impacts

This association has very low non-native plant cover (average 0.2%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Hypochaeris radicata*, and *Plantago lanceolata*.

Classification Comments

Garrya elliptica Provisional Association
Baccharis pilularis Shrubland Alliance

This association was originally placed in it's own provisional alliance in Point Reyes (Keeler-Wolf et al. 2003a). It is considered provisional since it is under-sampled in its expected range. Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Buck-Diaz et al. 2020, Keeler-Wolf et al. 2003a

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=5; San Mateo County (n=2): SMAT0017, SMAT0073

Marin County (n=3): PGA41, PGA51A, PGA98

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Garrya elliptica</i>	100.0	56.3	40.6	15	70		Y		Y
	<i>Baccharis pilularis</i>	100.0	17.6	11.6	0.2	22				Y
	<i>Toxicodendron diversilobum</i>	100.0	6.4	4.9	0.2	15				Y
	<i>Frangula californica</i>	60.0	3.4	2.4	0.2	7				Y
	<i>Artemisia californica</i>	60.0	2.9	2.0	0.2	5				Y
	<i>Holodiscus discolor</i>	60.0	2.1	1.2	0.2	4				Y
	<i>Rubus parviflorus</i>	40.0	7.2	4.8	9	15				
	<i>Diplacus aurantiacus</i>	40.0	0.4	0.2	0.2	1				
	Herb	<i>Polystichum munitum</i>	80.0	36.1	5.6	2	12			Y
<i>Pteridium aquilinum</i>		80.0	25.9	5.0	0.2	12				Y

***Ceanothus cuneatus* Shrubland Alliance**



Common Name: Wedge leaf ceanothus chaparral, Buck brush chaparral

NVC Alliance Code: A3869. *Ceanothus cuneatus* Chaparral Alliance

Statewide Description

Ceanothus cuneatus is dominant or co-dominant in the shrub canopy with *Adenostoma fasciculatum*, *Arctostaphylos glauca*, *Arctostaphylos manzanita*, *Arctostaphylos patula*, *Arctostaphylos tomentosa*, *Ceanothus integerrimus*, *Cercocarpus montanus*, *Eriogonum fasciculatum*, *Garrya fremontii*, *Hesperoyucca whipplei*, *Heteromeles arbutifolia*, *Quercus berberidifolia*, *Quercus john-tuckeri*, *Rhus ovata*, and *Salvia mellifera*. Emergent trees may be present at low cover, including *Calocedrus decurrens*, *Juniperus californica*, *Pinus jeffreyi*, *Pinus ponderosa*, *Pinus sabiniana*, *Quercus douglasii*, or *Quercus wislizeni*.

Ceanothus cuneatus occurs as an understory shrub in various forest and woodland types in northern California, and it is present as a secondary species in many chaparral alliances in California. Self-perpetuating stands are typically restricted to rocky, harsh exposures or substrates. Many stands establish after fire, and they form an important part of the chaparral in northern and central California. *Ceanothus cuneatus* stands are often dense, with interlocking crowns that may contain abundant deadwood. *Ceanothus cuneatus* may also form open stands with much bare ground.

Mixed stands with co-dominant *Adenostoma fasciculatum* are common in the central coast and inner North Coast Ranges, and occur more sporadically in the Sierra Nevada

Ceanothus cuneatus Shrubland Alliance

and in southern California. These mixed stands occur on a variety of exposures along steep lower to upper slopes. Substrates are usually sedimentary and metamorphic. Because of ecological overlap between mixed and pure *Ceanothus cuneatus* stands, the former practice of segregating them into separate series or alliances has been discontinued. There are five varieties of *Ceanothus cuneatus* (Fross and Wilken 2006); *Ceanothus cuneatus* var. *cuneatus* and *C. cuneatus* var. *ramulosus* are included in this alliance.

Local Vegetation Description

The Wedge leaf ceanothus chaparral, Buck brush chaparral Alliance forms an intermittent to continuous shrub layer. The herbaceous layer is sparse. Dominant and characteristic shrubs include *Ceanothus cuneatus*, *Adenostoma fasciculatum*, *Baccharis pilularis*, *Diplacus aurantiacus*, *Heteromeles arbutifolia*, *Lepechinia calycina*, and *Toxicodendron diversilobum*, and those that are often present include *Arctostaphylos crustacea* and *Lotus scoparius*. Herbs that are often present include *Anagallis arvensis*, *Chlorogalum pomeridianum*, *Marah fabaceus*, *Sanicula crassicaulis*, *Scrophularia californica*, and *Zigadenus fremontii*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.5	0 – 2	3.5	2 – 5
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	1.3	0.0 – 5.0	3.5	2 – 5
Shrub	71.5	42.0 – 90.0	3.0	1 – 5
Herb	2.3	0 – 3	0.3	0 – 0.5

Local Membership Rule

Ceanothus cuneatus dominates or co-dominates with *Adenostoma fasciculatum*, often on convexities with westerly exposures. A variety of shrubs may intermix, including *Arctostaphylos*, *Baccharis*, *Eriodictyon*, *Heteromeles*, *Quercus durata*, and others.

Local Environmental Description

Elevation: Mean 180 m, Range 115 – 222 m

Aspect: NE (1), SE (1), SW (1)

Slope: Mean 15 degrees, Range 8 – 24 degrees

Macro Topography: Lower to Middle 1/3 of slope (1), Middle 1/3 of slope (1), Ridge top (1)

Large Rock: Mean 2.4%, Range 0.0 – 7.0%

Small Rock: Mean 4.4%, Range 3.0 – 7.2%

Fines Cover: Mean 65.7%, Range 47.0 – 80.0%

Litter Cover: Mean 25.0%, Range 10.0 – 40%

Soil Texture (field assessed): Coarse, loamy sand (1), Moderately fine clay loam (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Franciscan melange (1), Serpentine (1), Mixed sedimentary (1), Sandstone (1)

San Mateo County Watersheds: San Mateo Bayside (3), Palo Alto (1)

Site Impacts

This alliance has very low non-native plant cover (average 0.6%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira caryophyllea*, *Anagallis arvensis*, *Brachypodium distachyon*, *Capsella bursa-pastoris*, *Centaurea melitensis*, and *Gastroidium phleoides*.

Associations in San Mateo County

- *Ceanothus cuneatus* – *Adenostoma fasciculatum*
- *Ceanothus cuneatus* Alliance

Classification Comments

None.

References: Borchert et al. 2004, Buck and Evens 2010, Buck-Diaz and Evens 2011b, Buck-Diaz et al. 2012, Evens et al. 2004, Gordon and White 1994, Keeler-Wolf et al. 2003b, Kittel et al. 2012, Klein and Evens 2005, Klein et al. 2007, Klein et al. 2015, Reyes et al. 2020a, Taylor and Teare 1979a, VegCAMP 2015a

Global Rarity Rank: G4

State Rarity Rank: S4

Surveys Used for Description

Total: N=4; San Mateo County (n=4): PGA937, SMAT0021, SMAT0076, SMAT0245

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Regenerating or Shrubby Trees	<i>Quercus agrifolia</i>	25.0	15.0	0.8	3	3				
	<i>Pseudotsuga menziesii</i>	25.0	10.0	0.5	2	2				
Shrub	<i>Ceanothus cuneatus</i>	100.0	50.1	35.5	22	50	Y	Y		Y
	<i>Adenostoma fasciculatum</i>	75.0	24.6	20.0	10	40	Y			Y
	<i>Baccharis pilularis</i>	75.0	7.7	4.5	3	8	Y			Y
	<i>Heteromeles arbutifolia</i>	75.0	3.4	2.6	0.2	10	Y			Y
	<i>Diplacus aurantiacus</i>	75.0	5.4	2.6	0.2	8	Y			Y
	<i>Toxicodendron diversilobum</i>	75.0	3.4	1.8	0.2	4	Y			Y

Ceanothus cuneatus Shrubland Alliance

	<i>Lepechinia calycina</i>	75.0	0.2	0.2	0.2	0.2	Y	Y
	<i>Arctostaphylos crustacea</i>	50.0	3.8	3.0	2	10		Y
	<i>Lotus scoparius</i>	50.0	0.2	0.1	0.2	0.2		Y
	<i>Ceanothus thyrsiflorus</i>	25.0	0.6	0.5	2	2		
	<i>Clematis lasiantha</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Rhamnus crocea</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Ribes californicum</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Ribes malvaceum</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Sambucus nigra</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Eriodictyon californicum</i>	25.0	0.1	0.1	0.2	0.2		
	<i>Eriophyllum confertiflorum</i>	25.0	0.1	0.1	0.2	0.2		
Herb								
	<i>Chlorogalum pomeridianum</i>	50.0	15.2	0.5	1	1		Y
	<i>Marah fabaceus</i>	50.0	10.1	0.3	0.2	1		Y
	<i>Scrophularia californica</i>	50.0	15.3	0.1	0.2	0.2		Y
	<i>Zigadenus fremontii</i>	50.0	4.2	0.1	0.2	0.2		Y
	<i>Sanicula crassicaulis</i>	50.0	3.0	0.1	0.2	0.2		Y
	<i>Anagallis arvensis</i>	50.0	4.3	0.1	0.2	0.2		Y
	<i>Pseudognaphalium californicum</i>	25.0	1.6	0.1	0.2	0.2		
	<i>Pentagramma triangularis</i>	25.0	2.8	0.1	0.2	0.2		
	<i>Solanum umbelliferum</i>	25.0	1.6	0.1	0.2	0.2		
	<i>Pedicularis densiflora</i>	25.0	1.5	0.1	0.2	0.2		
	<i>Nassella lepida</i>	25.0	1.6	0.1	0.2	0.2		
	<i>Navarretia heterodoxa</i>	25.0	1.6	0.1	0.2	0.2		
	<i>Galium porrigens</i>	25.0	2.8	0.1	0.2	0.2		
	<i>Brachypodium distachyon</i>	25.0	1.6	0.1	0.2	0.2		
	<i>Capsella bursa-pastoris</i>	25.0	12.5	0.1	0.2	0.2		
	<i>Gastridium phleoides</i>	25.0	1.6	0.1	0.2	0.2		
	<i>Cardamine oligosperma</i>	25.0	2.8	0.1	0.2	0.2		
	<i>Aira caryophyllea</i>	25.0	1.5	0.1	0.2	0.2		
	<i>Centaurea melitensis</i>	25.0	1.6	0.1	0.2	0.2		
	<i>Centaureum muehlenbergii</i>	25.0	1.6	0.1	0.2	0.2		
	<i>Claytonia perfoliata</i>	25.0	2.8	0.1	0.2	0.2		
	<i>Cynoglossum grande</i>	25.0	1.5	0.1	0.2	0.2		
	<i>Daucus pusillus</i>	25.0	1.6	0.1	0.2	0.2		
	<i>Dryopteris arguta</i>	25.0	1.5	0.1	0.2	0.2		
	<i>Galium aparine</i>	25.0	1.5	0.1	0.2	0.2		
	<i>Achillea millefolium</i>	25.0	2.8	0.1	0.2	0.2		

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
	<i>Cynoglossum grande</i>	25	1.5	0.1	0.2	0.2				
	<i>Dryopteris arguta</i>	25	1.5	0.1	0.2	0.2				
	<i>Aira caryophylla</i>	25	1.5	0.1	0.2	0.2				
	<i>Pedicularis densiflora</i>	25	1.5	0.1	0.2	0.2				
	<i>Galium aparine</i>	25	1.5	0.1	0.2	0.2				
	<i>Nassella lepida</i>	25	1.6	0.1	0.2	0.2				
	<i>Daucus pusillus</i>	25	1.6	0.1	0.2	0.2				
	<i>Navarretia heterodoxa</i>	25	1.6	0.1	0.2	0.2				
	<i>Achillea millefolium</i>	25	2.8	0.1	0.2	0.2				
	<i>Pentagramma triangularis</i>	25	2.8	0.1	0.2	0.2				
	<i>Solanum umbelliferum</i>	25	1.6	0.1	0.2	0.2				
	<i>Claytonia perfoliata</i>	25	2.8	0.1	0.2	0.2				
	<i>Galium porrigens</i>	25	2.8	0.1	0.2	0.2				
	<i>Capsella bursa-pastoris</i>	25	12.5	0.1	0.2	0.2				
	<i>Pseudognaphalium californicum</i>	25	1.6	0.1	0.2	0.2				

***Ceanothus cuneatus* – *Adenostoma fasciculatum* Association**

Common Name: Wedgeleaf Ceanothus – Chamise Shrubland

Alliance: *Ceanothus cuneatus* Shrubland Alliance

Local Vegetation Description

The Wedgeleaf Ceanothus – Chamise Association forms a continuous shrub layer. The emergent tree layer is typically sparse, and the herbaceous layer is sparse to continuous. Dominant and characteristic shrubs include *Adenostoma fasciculatum*, *Ceanothus cuneatus*, and *Diplacus aurantiacus*, and those that are often present include *Baccharis pilularis*, *Heteromeles arbutifolia*, *Lepechinia calycina*, and *Toxicodendron diversilobum*. Herbs that are sometimes present include *Chlorogalum pomeridianum*, *Galium porrigens*, *Marah fabaceus*, *Pentagramma triangularis*, and *Zigadenus fremontii*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.7	0 – 2	3.5	2 – 5
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	1.7	0 – 5.0	3.5	2 – 5
Shrub	81.3	77.0 – 90.0	2.8	1 – 5
Herb	2.0	0 – 3	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 175 m, Range 115 – 222 m

Aspect: NE (1), SW (1)

Slope: Mean 19 degrees, Range 13 – 24 degrees

Macro Topography: Lower to Middle 1/3 of slope (1), Middle 1/3 of slope (1)

Large Rock: Mean 3.6%, Range 0.2 – 7.0%

Small Rock: Mean 5.1%, Range 3.0 – 7.2%

Fines Cover: Mean 63.5%, Range 47.0 – 80.0%

Litter Cover: Mean 25.0%, Range 10.0 – 40%

Soil Texture (field assessed): Moderately fine clay loam (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Serpentine (1), Franciscan melange (1), Mixed sedimentary (1)

San Mateo County Watersheds: San Mateo Bayside (3)

Site Impacts

This association has very low non-native plant cover (average 0.2%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira caryophylla*, *Anagallis arvensis*, and *Capsella bursa-pastoris*.

Ceanothus cuneatus – *Adenostoma fasciculatum* Association
Ceanothus cuneatus Shrubland Alliance

Classification Comments

None.

References: Borchert et al. 2004, Buck and Evens 2010, Buck-Diaz and Evens 2011b, Buck-Diaz et al. 2012, Gordon and White 1994, Keeler-Wolf et al. 2003b, Kittel et al. 2012, Klein et al. 2007, Klein et al. 2015

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: N

Surveys Used for Description

Total: N=3; San Mateo County (n=3): PGA937, SMAT0021, SMAT0076

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Regenerating or Shrubby Trees	<i>Quercus agrifolia</i>	33.3	20.0	1.0	3	3				
	<i>Pseudotsuga menziesii</i>	33.3	13.3	0.7	2	2				
Shrub	<i>Ceanothus cuneatus</i>	100.0	49.9	40.0	30	50			Y	Y
	<i>Adenostoma fasciculatum</i>	100.0	32.8	26.7	10	40			Y	Y
	<i>Heteromeles arbutifolia</i>	100.0	4.6	3.5	0.2	10				Y
	<i>Arctostaphylos crustacea</i>	66.7	5.0	4.0	2	10				Y
	<i>Baccharis pilularis</i>	66.7	4.1	3.3	3	7				Y
	<i>Toxicodendron diversilobum</i>	66.7	1.4	1.1	0.2	3				Y
	<i>Diplacus aurantiacus</i>	66.7	1.0	0.7	0.2	2				Y
	<i>Lepechinia calycina</i>	66.7	0.2	0.1	0.2	0.2				Y
	<i>Ceanothus thyrsiflorus</i>	33.3	0.8	0.7	2	2				
	<i>Sambucus nigra</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Eriodictyon californicum</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Ribes californicum</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Lotus scoparius</i>	33.3	0.1	0.1	0.2	0.2				
Herb	<i>Scrophularia californica</i>	66.7	20.4	0.1	0.2	0.2				Y
	<i>Marah fabaceus</i>	66.7	13.5	0.4	0.2	1				Y

Ceanothus cuneatus – *Adenostoma fasciculatum* Association
Ceanothus cuneatus Shrubland Alliance

<i>Zigadenus fremontii</i>	66.7	5.7	0.1	0.2	0.2	Y
<i>Capsella bursa-pastoris</i>	33.3	16.7	0.1	0.2	0.2	
<i>Chlorogalum pomeridianum</i>	33.3	9.8	0.3	1	1	
<i>Cardamine oligosperma</i>	33.3	3.7	0.1	0.2	0.2	
<i>Pentagramma triangularis</i>	33.3	3.7	0.1	0.2	0.2	
<i>Claytonia perfoliata</i>	33.3	3.7	0.1	0.2	0.2	
<i>Achillea millefolium</i>	33.3	3.7	0.1	0.2	0.2	
<i>Galium porrigens</i>	33.3	3.7	0.1	0.2	0.2	
<i>Anagallis arvensis</i>	33.3	3.7	0.1	0.2	0.2	
<i>Galium aparine</i>	33.3	2.0	0.1	0.2	0.2	
<i>Cynoglossum grande</i>	33.3	2.0	0.1	0.2	0.2	
<i>Aira caryophylla</i>	33.3	2.0	0.1	0.2	0.2	
<i>Sanicula crassicaulis</i>	33.3	2.0	0.1	0.2	0.2	
<i>Pedicularis densiflora</i>	33.3	2.0	0.1	0.2	0.2	
<i>Dryopteris arguta</i>	33.3	2.0	0.1	0.2	0.2	

***Ceanothus thyrsiflorus* Shrubland Alliance**



Common Name: Blue blossom chaparral

NVC Alliance Code: A0741. *Ceanothus thyrsiflorus* Scrub Alliance

Statewide Description

Ceanothus thyrsiflorus is dominant or co-dominant in the shrub canopy with *Adenostoma fasciculatum*, *Arctostaphylos manzanita*, *Baccharis pilularis*, *Ceanothus incanus*, *Ceanothus integerrimus*, *Ceanothus velutinus*, *Gaultheria shallon*, *Heteromeles arbutifolia*, *Lupinus arboreus*, *Quercus berberidifolia*, *Rubus ursinus*, *Toxicodendron diversilobum*, and *Vaccinium ovatum*. Emergent conifer trees may be present at low cover.

The most extensive *Ceanothus thyrsiflorus* stands establish after logging or burning in the outer Coast Ranges of central and northern California. These stands persist for a few decades and are seral to stands of the *Pinus muricata*, *Pseudotsuga menziesii* – *Notholithocarpus densiflorus*, and *Sequoia sempervirens* Alliances. Stands on exposed coastal headlands persist for long periods and are frequently associated with *Baccharis pilularis* and *Lupinus arboreus* Alliance shrublands.

Local Vegetation Description

The Blue blossom chaparral Alliance forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is sparse to intermittent. Dominant and characteristic shrubs include *Ceanothus thyrsiflorus* and

Rubus ursinus, and those that are often present include *Baccharis pilularis* and *Diplacus aurantiacus*. Commonly associated emergent trees at sparse cover include *Pinus muricata*, *Pseudotsuga menziesii* and *Umbellularia californica*. The herbs that are often present include *Polystichum munitum* and *Pteridium aquilinum*, and herbs that are sometimes present include *Holcus lanatus*.

Local Vegetation Description

The Blue blossom chaparral Alliance forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is open. Dominant and characteristic shrubs include *Ceanothus thyrsiflorus*, *Baccharis pilularis*, *Rubus ursinus*, and *Toxicodendron diversilobum*, and those that are often present include *Frangula californica* and *Heteromeles arbutifolia*. Commonly associated emergent trees at sparse cover include *Quercus agrifolia*. *Clinopodium douglasii* is often present in the herbaceous layer, and herbs that are sometimes present include *Chlorogalum pomeridianum*, *Dryopteris arguta*, *Heracleum maximum*, *Iris douglasiana*, *Marah fabaceus*, *Pteridium aquilinum*, *Sanicula crassicaulis*, *Scrophularia californica*, and *Stachys ajugoides*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.3	0 – 2	no data	no data
Hardwood	0.9	0 – 5	5.5	2 – 10
Regenerating or Shrubby Tree	0.7	0.0 – 7.0	no data	no data
Shrub	83.7	37.5 – 99.0	3.1	1 – 5
Herb	7.9	0 – 34	0.3	0 – 0.5

Local Membership Rule

Ceanothus thyrsiflorus dominates in the overstory shrub layer, often with moderately dense cover. *Diplacus aurantiacus*, *Heteromeles*, *Pseudotsuga menziesii*, *Quercus wislizeni*, and other species may intermix as sub-dominants in the shrub and tree layers. If *Baccharis pilularis* is present, *Ceanothus thyrsiflorus* is greater in cover. Stands of *C. incanus* are included in the *C. thyrsiflorus* Alliance since they are more limited in distribution and are ecologically similar to *C. thyrsiflorus*.

Local Environmental Description

Elevation: Mean 253 m, Range 93 – 450 m

Aspect: NE (3), NW (3), SE (1)

Slope: Mean 13 degrees, Range 4 – 26 degrees

Macro Topography: Middle 1/3 of slope (3), Upper 1/3 of slope to Ridgetop (1), Ridge top (1), Other (1), Lower 1/3 of slope (1)

Large Rock: Mean 1.1%, Range 0.0 – 4.0%

Small Rock: Mean 3.9%, Range 0.0 – 12.0%

Fines Cover: Mean 34.0%, Range 3.0 – 50.0%

Litter Cover: Mean 30.3%, Range 0.0 – 94%

Soil Texture (field assessed): Medium loam (3), Medium to very fine, sandy loam

Ceanothus thyrsiflorus Shrubland Alliance

(1), Moderately coarse, sandy loam (1), Moderately fine clay loam (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Franciscan melange (7), Volcanic and metavolcanic rocks (3), Mixed metamorphic (2), Sandstone and other sedimentary (2), Granitic (1), Sandstone (1)

San Mateo County Watersheds: San Mateo Bayside (12), Pacifica (2), Half Moon Bay (1), Tunitas Creek (1)

Site Impacts

This alliance has low non-native plant cover (average 1.9%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Conium maculatum*, *Cortaderia jubata*, and *Plantago lanceolata*.

Associations in San Mateo County

- *Ceanothus thyrsiflorus* – (*Rubus ursinus*)
- *Ceanothus thyrsiflorus* – *Baccharis pilularis* – *Toxicodendron diversilobum*

Classification Comments

None.

References: Evens and Kentner 2006, Keeler-Wolf et al. 2003a

Global Rarity Rank: G4

State Rarity Rank: S4

Surveys Used for Description

Total: N=17; San Mateo County (n=17): GGNRA321, GGNRA340, GGNRA343, GGNRA382, PGA11710, PGA12034, PGA746, PGA747, PGA911, PGA917, PGA939, PGA944, PGA969, PWNCS02A, SMAT0036, SMAT0038, SMAT0042

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	29.4	17.4	1.1	1	10				
Shrub	<i>Ceanothus thyrsiflorus</i>	100.0	39.6	33.9	5	80	Y		Y	Y
	<i>Baccharis pilularis</i>	88.2	18.6	15.8	3	38	Y			Y
	<i>Rubus ursinus</i>	88.2	10.6	8.2	1	20	Y			Y
	<i>Toxicodendron diversilobum</i>	82.4	9.1	8.1	0.2	34	Y			Y
	<i>Frangula californica</i>	58.8	4.9	4.4	0.2	40				Y
	<i>Heteromeles arbutifolia</i>	52.9	5.7	4.6	0.2	25				Y

Ceanothus thyrsiflorus Shrubland Alliance

	<i>Diplacus aurantiacus</i>	41.2	0.4	0.3	0.2	2.2	
	<i>Prunus ilicifolia</i>	35.3	2.4	2.0	0.2	13	
	<i>Eriodictyon californicum</i>	35.3	2.7	1.8	0.2	11	
Herb							
	<i>Clinopodium douglasii</i>	52.9	12.2	1.8	0.2	15	Y
	<i>Scrophularia californica</i>	47.1	7.9	0.4	0.2	3	
	<i>Sanicula crassicaulis</i>	35.3	8.2	1.9	0.2	20	
	<i>Dryopteris arguta</i>	35.3	14.2	0.8	0.2	8	
	<i>Marah fabaceus</i>	35.3	1.3	0.1	0.2	1.2	
	<i>Chlorogalum pomeridianum</i>	29.4	2.1	0.2	0.2	3	
	<i>Heracleum maximum</i>	29.4	1.2	0.1	0.2	0.4	
	<i>Stachys ajugoides</i>	23.5	2.3	0.6	0.2	10	
	<i>Pteridium aquilinum</i>	23.5	1.1	0.1	0.2	0.4	
	<i>Iris douglasiana</i>	23.5	0.6	0.0	0.2	0.2	

***Ceanothus thyrsiflorus* – (*Rubus ursinus*) Association**

Common Name: Blue Blossom – California blackberry Shrubland

Alliance: *Ceanothus thyrsiflorus* Shrubland Alliance

Local Vegetation Description

The Blue Blossom – California blackberry Association forms a continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is sparse to open. Dominant and characteristic shrubs include *Ceanothus thyrsiflorus* and *Rubus ursinus*, and those that are often present include *Diplacus aurantiacus* and *Frangula californica*. Commonly associated emergent trees at sparse cover include *Pinus muricata*, *Pseudotsuga menziesii*, *Quercus agrifolia*, *Umbellularia californica*. Herbs that are often present include *Polystichum munitum* and *Pteridium aquilinum*, and herbs that are sometimes present include *Holcus lanatus*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.5	0 – 2	no data	no data
Hardwood	2.0	0 – 5	5.5	2 – 10
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	86.8	80.0 – 95.0	2.8	1 – 5
Herb	3.0	0 – 5	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 260 m, Range 141 – 450 m

Aspect: NW (2)

Slope: Mean 23 degrees, Range 20 – 26 degrees

Macro Topography: Middle 1/3 of slope (2)

Large Rock: Mean 0.7%, Range 0.2 – 1.2%

Small Rock: Mean 5.7%, Range 1.2 – 10.2%

Fines Cover: Mean 47.5%, Range 45.0 – 50.0%

Litter Cover: Mean 44.0%, Range 37.0 – 51%

Soil Texture (field assessed): Medium loam (2)

Geology (field or map data): Mixed metamorphic (2), Franciscan melange (1), Granitic (1)

San Mateo County Watersheds: San Mateo Bayside (3), Pacifica (1)

Site Impacts

This association has very low non-native plant cover (average 0.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Cortaderia jubata*.

Classification Comments

None.

References: Evens and Kentner 2006

Global Rarity Rank: G3

State Rarity Rank: S3?

State Rare: Y

Surveys Used for Description

Total: N=4; San Mateo County (n=4): PGA746, PGA939, SMAT0036, SMAT0038

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	75.0	52.1	1.8	1	5		Y		Y
	<i>Pseudotsuga menziesii</i>	25.0	12.5	0.5	2	2				
	<i>Umbellularia californica</i>	25.0	6.3	0.3	1	1				
	<i>Aesculus californica</i>	25.0	4.2	0.1	0.2	0.2				
Shrub	<i>Ceanothus thyrsiflorus</i>	100.0	52.0	40.0	5	80		Y		Y
	<i>Rubus ursinus</i>	75.0	14.4	9.0	1	20				Y
	<i>Frangula californica</i>	75.0	11.2	10.8	0.2	40				Y
	<i>Heteromeles arbutifolia</i>	75.0	3.8	2.1	0.2	5				Y
	<i>Toxicodendron diversilobum</i>	75.0	0.8	0.6	0.2	1				Y
	<i>Baccharis pilularis</i>	50.0	7.7	5.0	10	10				Y
	<i>Eriodictyon californicum</i>	50.0	6.9	3.8	5	10				Y
	<i>Prunus ilicifolia</i>	50.0	1.0	0.6	0.2	2				Y
	<i>Corylus cornuta</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Holodiscus discolor</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Sambucus racemosa</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Rubus parviflorus</i>	25.0	1.2	1.3	5	5				
	<i>Diplacus aurantiacus</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Lepechinia calycina</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Lonicera involucrata</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Symphoricarpos mollis</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Oemleria cerasiformis</i>	25.0	0.1	0.1	0.2	0.2				
<i>Rosa gymnocarpa</i>	25.0	0.1	0.1	0.2	0.2					
<i>Symphoricarpos albus</i>	25.0	0.1	0.1	0.2	0.2					
Herb	<i>Scrophularia californica</i>	100.0	24.4	1.1	0.2	3				Y
	<i>Dryopteris arguta</i>	50.0	16.2	0.5	1	1				Y

Ceanothus thyrsiflorus – (*Rubus ursinus*) Association
Ceanothus thyrsiflorus Shrubland Alliance

<i>Heracleum maximum</i>	50.0	4.0	0.2	0.2	0.4	Y
<i>Stachys bullata</i>	50.0	3.2	0.1	0.2	0.2	Y
<i>Cynoglossum grande</i>	50.0	3.2	0.1	0.2	0.2	Y
<i>Salvia spathacea</i>	50.0	3.2	0.1	0.2	0.2	Y
<i>Claytonia perfoliata</i>	50.0	3.2	0.1	0.2	0.2	Y
<i>Marah oreganus</i>	50.0	3.2	0.1	0.2	0.2	Y
<i>Clinopodium douglasii</i>	50.0	2.4	0.2	0.2	0.4	Y
<i>Pteridium aquilinum</i>	50.0	2.4	0.2	0.2	0.4	Y
<i>Pentagramma triangularis</i>	50.0	2.2	0.1	0.2	0.2	Y
<i>Eriophyllum stoechadifolium</i>	25.0	22.1	3.8	15	15	
<i>Polystichum munitum</i>	25.0	2.1	0.1	0.4	0.4	
<i>Chlorogalum pomeridianum</i>	25.0	1.3	0.1	0.2	0.2	
<i>Barbarea orthoceras</i>	25.0	1.3	0.1	0.2	0.2	
<i>Pseudognaphalium spp.</i>	25.0	1.3	0.1	0.2	0.2	
<i>Cardamine oligosperma</i>	25.0	1.3	0.1	0.2	0.2	
<i>Marah spp.</i>	25.0	1.0	0.1	0.2	0.2	
<i>Stachys ajugoides</i>	25.0	0.3	0.1	0.2	0.2	
<i>Plantago erecta</i>	25.0	0.3	0.1	0.2	0.2	
<i>Sanicula crassicaulis</i>	25.0	0.3	0.1	0.2	0.2	
<i>Galium spp.</i>	25.0	0.3	0.1	0.2	0.2	
<i>Cortaderia jubata</i>	25.0	0.3	0.1	0.2	0.2	
<i>Fragaria vesca</i>	25.0	0.3	0.1	0.2	0.2	

***Ceanothus thyrsiflorus* – *Baccharis pilularis* – *Toxicodendron diversilobum* Association**

Common Name: Blue Blossom Ceanothus – Coyote Brush – Poison Oak Shrubland

Alliance: *Ceanothus thyrsiflorus* Shrubland Alliance

Local Vegetation Description

The Blue Blossom Ceanothus – Coyote Brush – Poison Oak Association forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is sparse to open. Dominant and characteristic shrubs include *Ceanothus thyrsiflorus*, *Baccharis pilularis*, *Rubus ursinus*, and *Toxicodendron diversilobum*, and those that are often present include *Frangula californica*. Herbs that are often present include *Clinopodium douglasii*, and herbs that are sometimes present include *Aira caryophyllea*, *Anagallis arvensis*, *Chlorogalum pomeridianum*, *Dryopteris arguta*, *Heracleum maximum*, *Iris douglasiana*, *Marah fabaceus*, *Nassella pulchra*, *Sanicula crassicaulis*, *Scrophularia californica*, and *Stachys ajugoides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.2	0 – 1	no data	no data
Hardwood	0.4	0 – 4	no data	no data
Regenerating or Shrubby Tree	0.9	0 – 7.0	no data	no data
Shrub	82.4	37.5 – 99.0	3.3	1 – 5
Herb	4.6	0 – 15	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 251 m, Range 93 – 354 m

Aspect: NE (3), NW (1), SE (1)

Slope: Mean 9 degrees, Range 4 – 15 degrees

Macro Topography: Middle 1/3 of slope (1), Upper 1/3 of slope to Ridgetop (1), Other (1), Lower 1/3 of slope (1), Ridge top (1)

Large Rock: Mean 1.2%, Range 0.0 – 4.0%

Small Rock: Mean 3.3%, Range 0.0 – 12.0%

Fines Cover: Mean 20.5%, Range 3.0 – 38.0%

Litter Cover: Mean 25.7%, Range 0.0 – 94%

Soil Texture (field assessed): Medium loam (1), Medium to very fine, sandy loam (1), Moderately coarse, sandy loam (1), Moderately fine clay loam (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Franciscan melange (6), Volcanic and metavolcanic rocks (3), Sandstone and other sedimentary (2), Sandstone (1)

San Mateo County Watersheds: San Mateo Bayside (9), Half Moon Bay (1), Pacifica

Ceanothus thyrsiflorus – *Baccharis pilularis* – *Toxicodendron diversilobum* Association
Ceanothus thyrsiflorus Shrubland Alliance

(1), Tunitas Creek (1)

Site Impacts

This association has low non-native plant cover (average 2.4%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira caryophyllea* and *Anagallis arvensis*.

Classification Comments

None.

References: Keeler-Wolf et al. 2003a

Global Rarity Rank: G4?

State Rarity Rank: SNR

State Rare: N

Surveys Used for Description

Total: N=13; San Mateo County (n=13): GGNRA321, GGNRA340, GGNRA343, GGNRA382, PGA11710, PGA12034, PGA747, PGA911, PGA917, PGA944, PGA969, PWNCS02A, SMAT0042

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	75.0	52.1	1.8	1	5		Y		Y
	<i>Pseudotsuga menziesii</i>	25.0	12.5	0.5	2	2				
	<i>Umbellularia californica</i>	25.0	6.3	0.3	1	1				
	<i>Aesculus californica</i>	25.0	4.2	0.1	0.2	0.2				
Shrub	<i>Ceanothus thyrsiflorus</i>	100.0	35.8	32.0	10	80			Y	Y
	<i>Baccharis pilularis</i>	100.0	22.0	19.1	3	38				Y
	<i>Rubus ursinus</i>	92.3	9.4	7.9	1	20				Y
	<i>Toxicodendron diversilobum</i>	84.6	11.6	10.4	3	34				Y
	<i>Frangula californica</i>	53.8	3.0	2.5	1.2	10				Y
	<i>Heteromeles arbutifolia</i>	46.2	6.3	5.3	1	25				
	<i>Diplacus aurantiacus</i>	46.2	0.5	0.4	0.2	2.2				
	<i>Prunus ilicifolia</i>	30.8	2.8	2.5	4	13				
	<i>Eriodictyon californicum</i>	30.8	1.3	1.3	0.2	11				
	<i>Artemisia californica</i>	23.1	1.8	0.9	1	10				
	<i>Lonicera spp.</i>	23.1	0.1	0.1	0.2	1				
Herb	<i>Clinopodium douglasii</i>	53.8	15.3	2.4	0.2	15				Y

Ceanothus thyrsiflorus – *Baccharis pilularis* – *Toxicodendron diversilobum* Association
Ceanothus thyrsiflorus Shrubland Alliance

<i>Marah fabaceus</i>	46.2	1.6	0.2	0.2	1.2
<i>Sanicula crassicaulis</i>	38.5	10.6	2.5	0.2	20
<i>Dryopteris arguta</i>	30.8	13.6	1.0	0.2	8
<i>Scrophularia californica</i>	30.8	2.8	0.1	0.2	1
<i>Chlorogalum pomeridianum</i>	30.8	2.3	0.3	0.2	3
<i>Iris douglasiana</i>	30.8	0.8	0.1	0.2	0.2
<i>Stachys ajugoides</i>	23.1	2.9	0.8	0.2	10
<i>Nassella pulchra</i>	23.1	1.3	0.8	0.2	10
<i>Heracleum maximum</i>	23.1	0.4	0.1	0.2	0.4
<i>Anagallis arvensis</i>	23.1	0.3	0.1	0.2	1
<i>Aira caryophyllea</i>	23.1	0.2	0.0	0.2	0.2

***Cercocarpus montanus* Shrubland Alliance**



Common Name: Birch leaf mountain mahogany chaparral

NVC Alliance Code: A0587. *Cercocarpus montanus* var. *glaber* Mesic Chaparral Alliance

Statewide Description

Cercocarpus montanus is dominant or co-dominant in the shrub or small tree canopy with *Adenostoma fasciculatum*, *Adenostoma sparsifolium*, *Arctostaphylos glandulosa*, *Arctostaphylos glauca*, *Artemisia californica*, *Ceanothus crassifolius*, *Ceanothus cuneatus*, *Ceanothus megacarpus*, *Ceanothus spinosus*, *Eriogonum fasciculatum*, *Eriogonum wrightii*, *Fremontodendron californicum*, *Garrya flavescens*, *Hesperoyucca whipplei*, *Heteromeles arbutifolia*, *Malosma laurina*, *Prunus ilicifolia*, *Quercus berberidifolia*, *Quercus john-tuckeri*, *Rhamnus ilicifolia*, *Salvia apiana*, and *Salvia mellifera*. Emergent trees may be present at low cover, including *Juglans californica*, *Juniperus californica*, *Pinus monophylla*, *Pinus sabiniana*, *Platanus racemosa*, *Quercus agrifolia*, *Quercus chrysolepis*, *Quercus douglasii*, or *Umbellularia californica*.

Most *Cercocarpus montanus* stands are open and they frequently occur on steep, north-facing slopes, where the plant dominates on rocky ridges and steep slopes with thin soil (Uchytel 1991b). They typically occupy rockier sites than do denser *Ceanothus*- and *Quercus*-dominated chaparral types. In many recent taxonomic treatments, *Cercocarpus montanus* is considered to be a widespread polymorphic species throughout the western United States, with several varieties occurring in California. Since the varieties have similar ecology, all are included in this alliance. The most

Cercocarpus montanus Shrubland Alliance

recent California reference (UCB 2004- 2013) uses the names *Cercocarpus betuloides* for *C. montanus* and *Cercocarpus minutiflorus* for *C. montanus* var. *minutiflorus*.

Local Vegetation Description

The Birch leaf mountain mahogany chaparral Alliance forms an open to intermittent shrub layer. The emergent tree layer is typically sparse, and the herbaceous layer is open to intermittent. Dominant and characteristic shrubs include *Cercocarpus betuloides*, *Artemisia californica*, *Prunus ilicifolia*, and *Ribes californicum*, and those that are often present include *Ceanothus cuneatus*, *Clematis lasiantha*, *Heteromeles arbutifolia*, *Oemleria cerasiformis*, *Rhamnus crocea*, *Sambucus nigra*, *Symphoricarpos albus*, and *Toxicodendron diversilobum*. Regenerating or shrubby trees that are often present include *Quercus agrifolia* and *Umbellularia californica*. Commonly associated emergent trees at sparse cover include *Quercus agrifolia*. The herbaceous layer typically includes *Thalictrum fendleri*, *Chlorogalum pomeridianum*, *Delphinium californicum*, *Dichelostemma* spp., and *Marah fabaceus*, and herbs that are often present include *Adiantum jordanii*, *Claytonia perfoliata*, *Cynoglossum grande*, *Dryopteris arguta*, *Galium porrigens*, *Helenium puberulum*, *Melica torreyana*, *Pentagramma triangularis*, *Torilis arvensis*, and *Zigadenus fremontii*. Commonly associated non-vascular plants include Moss and Lichen.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.1	0 – 0.2	7.5	5 – 10
Regenerating or Shrubby Tree	0.2	0.0 – 0.4	3.5	2 – 5
Shrub	42.0	26 – 58	2.5	1 – 5
Herb	26.0	2 – 50	0.5	0 – 1

Local Membership Rule

Cercocarpus montanus (= *C. betuloides*) dominates with *Prunus ilicifolia*, *Artemisia californica* and/or *Ribes californicum* often present.

Local Environmental Description

Elevation: Mean 115 m, Range 114 – 116 m

Aspect: NW (1), Variable (1)

Slope: Mean 18 degrees, Range 15 – 21 degrees

Macro Topography: Lower to Upper 1/3 of slope (1), Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 1.0%

Fines Cover: Mean 48.5%, Range 20.0 – 77.0%

Litter Cover: Mean 21.0%, Range 20.0 – 22%

Soil Texture (field assessed): Coarse, loamy sand (1), Moderately coarse, sandy loam (1)

Geology (field or map data): Greenstone (2)

San Mateo County Watersheds: Palo Alto (2)

Site Impacts

This alliance has very low non-native plant cover (average 0.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Torilis arvensis*.

Associations in San Mateo County

- *Cercocarpus montanus* – *Prunus ilicifolia*

Classification Comments

None.

References: Borchert et al. 2004

Global Rarity Rank: G5

State Rarity Rank: S4

Surveys Used for Description

Total: N=2; San Mateo County (n=2): SCLAR126, SMAT0252

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree										
	<i>Quercus agrifolia</i>	50.0	50.0	0.1	0.2	0.2				Y
Regenerating or Shrubby Trees										
	<i>Quercus agrifolia</i>	50.0	25.0	0.1	0.2	0.2				Y
	<i>Umbellularia californica</i>	50.0	25.0	0.1	0.2	0.2				Y
Shrub										
	<i>Cercocarpus betuloides</i>	100.0	78.4	31.5	23	40	Y	Y		Y
	<i>Prunus ilicifolia</i>	100.0	8.7	4.5	1	8	Y			Y
	<i>Artemisia californica</i>	100.0	5.5	3.1	0.2	6	Y			Y
	<i>Ribes californicum</i>	100.0	2.1	0.6	0.2	1	Y			Y
	<i>Toxicodendron diversilobum</i>	50.0	1.7	1.0	2	2				Y
	<i>Sambucus nigra</i>	50.0	1.7	1.0	2	2				Y
	<i>Symphoricarpos albus</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Oemleria cerasiformis</i>	50.0	0.4	0.1	0.2	0.2				Y
	<i>Heteromeles arbutifolia</i>	50.0	0.4	0.1	0.2	0.2				Y

Cercocarpus montanus Shrubland Alliance

	<i>Clematis lasiantha</i>	50.0	0.4	0.1	0.2	0.2			Y
	<i>Ceanothus cuneatus</i>	50.0	0.2	0.1	0.2	0.2			Y
	<i>Rhamnus crocea</i>	50.0	0.4	0.1	0.2	0.2			Y
Herb									
	<i>Thalictrum fendleri</i>	100.0	31.9	20.1	0.2	40	Y	Y	Y
	<i>Delphinium californicum</i>	100.0	5.2	0.6	0.2	1	Y		Y
	<i>Marah fabaceus</i>	100.0	5.2	0.6	0.2	1	Y		Y
	<i>Dichelostemma spp.</i>	100.0	4.7	0.2	0.2	0.2	Y		Y
	<i>Chlorogalum pomeridianum</i>	100.0	4.7	0.2	0.2	0.2	Y		Y
	<i>Claytonia perfoliata</i>	50.0	20.5	15.0	30	30			Y
	<i>Cynoglossum grande</i>	50.0	0.1	0.1	0.2	0.2			Y
	<i>Adiantum jordanii</i>	50.0	4.5	0.1	0.2	0.2			Y
	<i>Galium porrigens</i>	50.0	4.5	0.1	0.2	0.2			Y
	<i>Helenium puberulum</i>	50.0	4.5	0.1	0.2	0.2			Y
	<i>Melica torreyana</i>	50.0	4.5	0.1	0.2	0.2			Y
	<i>Pentagramma triangularis</i>	50.0	4.5	0.1	0.2	0.2			Y
	<i>Torilis arvensis</i>	50.0	0.1	0.1	0.2	0.2			Y
	<i>Zigadenus fremontii</i>	50.0	0.1	0.1	0.2	0.2			Y
	<i>Dryopteris arguta</i>	50.0	4.5	0.1	0.2	0.2			Y
Non-Vascular									
	Moss	100.0	75.0	7.6	0.2	15	Y	Y	Y
	Lichen	50.0	25.0	0.1	0.2	0.2			Y

***Cercocarpus montanus* – *Prunus ilicifolia* Association**

Common Name: Birch Leaf Mountain Mahogany – Holly Leaf Cherry

Shrubland Alliance: *Cercocarpus montanus* Shrubland Alliance

Classification Comments

The association circumscription is the same as that of the alliance for the county. See above for detailed description.

References: Borchert et al. 2004

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: N

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree										
	<i>Quercus agrifolia</i>	50.0	50.0	0.1	0.2	0.2				Y
Regenerating or Shrubby Trees										
	<i>Quercus agrifolia</i>	50.0	25.0	0.1	0.2	0.2				Y
	<i>Umbellularia californica</i>	50.0	25.0	0.1	0.2	0.2				Y
Shrub										
	<i>Cercocarpus betuloides</i>	100.0	78.4	31.5	23	40		Y		Y
	<i>Prunus ilicifolia</i>	100.0	8.7	4.5	1	8				Y
	<i>Artemisia californica</i>	100.0	5.5	3.1	0.2	6				Y
	<i>Ribes californicum</i>	100.0	2.1	0.6	0.2	1				Y
	<i>Toxicodendron diversilobum</i>	50.0	1.7	1.0	2	2				Y
	<i>Sambucus nigra</i>	50.0	1.7	1.0	2	2				Y
	<i>Oemleria cerasiformis</i>	50.0	0.4	0.1	0.2	0.2				Y
	<i>Heteromeles arbutifolia</i>	50.0	0.4	0.1	0.2	0.2				Y
	<i>Clematis lasiantha</i>	50.0	0.4	0.1	0.2	0.2				Y
	<i>Rhamnus crocea</i>	50.0	0.4	0.1	0.2	0.2				Y
	<i>Symphoricarpos albus</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Ceanothus cuneatus</i>	50.0	0.2	0.1	0.2	0.2				Y
Herb										
	<i>Thalictrum fendleri</i>	100.0	31.9	20.1	0.2	40			Y	Y
	<i>Marah fabaceus</i>	100.0	5.2	0.6	0.2	1				Y

Cercocarpus montanus Shrubland Alliance

	<i>Delphinium californicum</i>	100.0	5.2	0.6	0.2	1		Y
	<i>Chlorogalum pomeridianum</i>	100.0	4.7	0.2	0.2	0.2		Y
	<i>Dichelostemma spp.</i>	100.0	4.7	0.2	0.2	0.2		Y
	<i>Claytonia perfoliata</i>	50.0	20.5	15.0	30	30		Y
	<i>Dryopteris arguta</i>	50.0	4.5	0.1	0.2	0.2		Y
	<i>Pentagramma triangularis</i>	50.0	4.5	0.1	0.2	0.2		Y
	<i>Galium porrigens</i>	50.0	4.5	0.1	0.2	0.2		Y
	<i>Helenium puberulum</i>	50.0	4.5	0.1	0.2	0.2		Y
	<i>Melica torreyana</i>	50.0	4.5	0.1	0.2	0.2		Y
	<i>Adiantum jordanii</i>	50.0	4.5	0.1	0.2	0.2		Y
	<i>Cynoglossum grande</i>	50.0	0.1	0.1	0.2	0.2		Y
	<i>Torilis arvensis</i>	50.0	0.1	0.1	0.2	0.2		Y
	<i>Zigadenus fremontii</i>	50.0	0.1	0.1	0.2	0.2		Y
Non-Vascular								
	Moss	100.0	75.0	7.6	0.2	15	Y	Y
	Lichen	50.0	25.0	0.1	0.2	0.2		Y

***Cornus sericea* Shrubland Alliance**



Common Name: Red osier thickets

NVC Alliance Code: A3834. *Cornus sericea* Pacific Slope Shrub Swamp Alliance

Statewide Description

Cornus sericea is dominant or co-dominant in the shrub canopy with *Cephalanthus occidentalis*, *Rubus armeniacus*, *Rubus parviflorus*, *Salix exigua* and *Salix lasiolepis*. Emergent trees may be present at low cover, including *Alnus rhombifolia* or *Quercus lobata*.

Hickson and Keeler-Wolf (2007) and Buck-Diaz et al. (2012) recognized two associations in the Central Valley; *S. lasiolepis* occurred as the more common association, and the other appeared to be rarer or was undersampled. Other stands with *Cornus sericea* exist closer to the coast, but more sampling and analysis is needed to determine their relationships. Other stands in the foothills and montane Sierra Nevada to eastern California with *Cornus sericea* are now placed in a separate mixed riparian alliance with *Rosa woodsii* and other shrubs.

Local Vegetation Description

The Red osier thickets Alliance forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is sparse to open. Dominant and characteristic shrubs include *Cornus sericea* and *Rubus ursinus*, and those that are often present include *Baccharis pilularis*, *Salix lasiolepis*, *Sambucus*

racemosa, and *Toxicodendron diversilobum*. Commonly associated emergent trees at sparse cover include *Acer macrophyllum* and *Alnus rubra*. The herbaceous layer typically includes *Scrophularia californica*, and herbs that are often present include *Heracleum maximum*, *Marah fabaceus*, *Myosotis latifolia*, *Polystichum munitum*, *Stachys bullata*, and *Urtica dioica*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	5.0	0 – 25	9.5	1 – 20
Hardwood	0.2	0 – 1	8.0	2 – 15
Regenerating or Shrubby Tree	0.5	0.0 – 2.7	2.1	0.5 – 5
Shrub	78.6	60 – 90	3.1	1 – 5
Herb	4.1	0.2 – 10	0.3	0 – 0.5

Local Membership Rule

Cornus sericea is dominant in the shrub layer. Emergent riparian trees and shrubs such as *Rubus ursinus* and *Toxicodendron diversilobum* are often present.

Local Environmental Description

Elevation: Mean 170 m, Range 70 – 496 m

Aspect: Flat (2), SW (2), NE (1)

Slope: Mean 12 degrees, Range 0 – 33 degrees

Macro Topography: Bottom (2), Lower to Middle 1/3 of slope (2), Middle 1/3 of slope (1)

Large Rock: Mean 0.0%, Range 0.0 – 0.0%

Small Rock: Mean 0.0%, Range 0.0 – 0.2%

Fines Cover: Mean 13.6%, Range 5.0 – 40.0%

Litter Cover: Mean 82.6%, Range 52.0 – 92%

Soil Texture (field assessed): Fine silty clay (1), Moderately fine clay loam (1), Moderately fine sandy clay loam (1), Muck (1), Unknown (1)

Geology (field or map data): Sandstone and other sedimentary (2), Mixed sedimentary (1), Mixed alluvium (1), Franciscan melange (1), Sandstone (1)

San Mateo County Watersheds: Tunitas Creek (2), Ano Nuevo (1), Half Moon Bay (1), Pescadero Creek (1), San Mateo Bayside (1)

Site Impacts

This alliance has low non-native plant cover (average 1.2%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Conium maculatum*, *Holcus lanatus*, *Myosotis latifolia*, and *Rumex crispus*.

Associations in San Mateo County

- *Cornus sericea* – *Salix (lasiolepis, exigua)*

Classification Comments

None.

References: Buck-Diaz et al. 2020

Global Rarity Rank: G4

State Rarity Rank: S3?

Surveys Used for Description

Total: N=6; San Mateo County (n=6): PWAWF01A, SMAT0040, SMAT0080, SMAT0183, SMAT0212, SMAT0295

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree										
	<i>Alnus rubra</i>	33.3	17.3	0.3	0.5	1				
	<i>Acer macrophyllum</i>	33.3	16.8	0.1	0.2	0.2				
Regenerating or Shrubby Trees										
	<i>Acer macrophyllum</i>	33.3	22.8	0.2	0.2	1				
Shrub										
	<i>Cornus sericea</i>	100.0	84.4	73.8	60	90	Y	Y		Y
	<i>Rubus ursinus</i>	100.0	2.9	2.6	0.2	8	Y			Y
	<i>Toxicodendron diversilobum</i>	66.7	2.0	1.7	0.2	5				Y
	<i>Salix lasiolepis</i>	50.0	4.7	4.0	2	12				Y
	<i>Sambucus racemosa</i>	50.0	2.0	1.7	0.2	10				Y
	<i>Baccharis pilularis</i>	50.0	0.5	0.4	0.2	2				Y
	<i>Lonicera involucrata</i>	33.3	1.0	0.8	2	3				
Herb										
	<i>Scrophularia californica</i>	83.3	7.7	0.5	0.2	2	Y			Y
	<i>Urtica dioica</i>	66.7	11.6	0.9	0.2	3				Y
	<i>Polystichum munitum</i>	66.7	4.7	0.1	0.2	0.2				Y
	<i>Marah fabaceus</i>	50.0	12.1	1.2	0.2	5				Y
	<i>Stachys bullata</i>	50.0	4.8	0.6	0.2	3				Y
	<i>Myosotis latifolia</i>	50.0	2.8	0.2	0.2	1				Y
	<i>Heracleum maximum</i>	50.0	2.0	0.1	0.2	0.2				Y
	<i>Holcus lanatus</i>	33.3	5.0	0.5	1	2				
	<i>Oenanthe sarmentosa</i>	33.3	5.4	0.2	0.2	1				
	<i>Rumex crispus</i>	33.3	3.0	0.1	0.2	0.2				
	<i>Conium maculatum</i>	33.3	0.8	0.1	0.2	0.2				
Non-Vascular										

Moss

33.3 25.0 0.4 0.2 2

***Cornus sericea* – *Salix (lasiolepis, exigua)* Association**

Common Name: Red Osier – Willow Shrubland

Alliance: *Cornus sericea* Shrubland Alliance

Classification Comments

The association circumscription is the same as that of the alliance for the county. See above for detailed description. This association is newly merged from the previous *Cornus sericea* – *Salix lasiolepis* and *Cornus sericea* – *Salix exigua* Associations.

References: Buck-Diaz et al. 2012, Hickson and Keeler-Wolf 2007

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Alnus rubra</i>	33.3	17.3	0.3	0.5	1				
	<i>Acer macrophyllum</i>	33.3	16.8	0.1	0.2	0.2				
Regenerating or Shrubby Trees	<i>Acer macrophyllum</i>	33.3	22.8	0.2	0.2	1				
Shrub	<i>Cornus sericea</i>	100.0	84.4	73.8	60	90		Y		Y
	<i>Rubus ursinus</i>	100.0	2.9	2.6	0.2	8				Y
	<i>Toxicodendron diversilobum</i>	66.7	2.0	1.7	0.2	5				Y
	<i>Salix lasiolepis</i>	50.0	4.7	4.0	2	12				Y
	<i>Sambucus racemosa</i>	50.0	2.0	1.7	0.2	10				Y
	<i>Baccharis pilularis</i>	50.0	0.5	0.4	0.2	2				Y
	<i>Lonicera involucrata</i>	33.3	1.0	0.8	2	3				
Herb	<i>Scrophularia californica</i>	83.3	7.7	0.5	0.2	2				Y
	<i>Urtica dioica</i>	66.7	11.6	0.9	0.2	3				Y
	<i>Polystichum munitum</i>	66.7	4.7	0.1	0.2	0.2				Y
	<i>Marah fabaceus</i>	50.0	12.1	1.2	0.2	5				Y
	<i>Stachys bullata</i>	50.0	4.8	0.6	0.2	3				Y
	<i>Myosotis latifolia</i>	50.0	2.8	0.2	0.2	1				Y
	<i>Heracleum maximum</i>	50.0	2.0	0.1	0.2	0.2				Y
	<i>Oenanthe sarmentosa</i>	33.3	5.4	0.2	0.2	1				

	<i>Holcus lanatus</i>	33.3	5.0	0.5	1	2
	<i>Rumex crispus</i>	33.3	3.0	0.1	0.2	0.2
	<i>Conium maculatum</i>	33.3	0.8	0.1	0.2	0.2
Non-Vascular						
	Moss	33.3	25.0	0.4	0.2	2

***Corylus cornuta* var. *californica* Shrubland Alliance**



Common Name: Hazelnut scrub

NVC Alliance Code: A4089. *Corylus cornuta* var. *californica* Scrub Alliance

Statewide Description

Corylus cornuta is dominant in the shrub canopy with *Holodiscus discolor*, *Marah fabaceus*, *Ribes sanguineum*, *R. parviflorus*, *R. ursinus*, *Toxicodendron diversilobum* and *Vaccinium ovatum*.

Corylus cornuta is a common understory shrub in many forest types because of its extensive range in the United States. The western form, var. *californica*, grows along the Pacific coast; the eastern form, var. *cornuta*, occurs in and east of the Rocky Mountains. NatureServe (2007a) suggests very different environmental conditions for the eastern form, so we include only the western subspecies in this alliance. The western form sprouts only from the root crown and not from lateral root suckers, as in var. *cornuta* (Zimmerman 1991b). Plants grow in moist, well-drained soils and cool, shaded sites on north-facing slopes; along stream banks; in moist, wooded canyons and slopes; and as understory species in woodlands and forests. They also are abundant on stony soils of slopes, on dry and rocky islands, and along stream banks (Zimmerman 1991b). Shrubland stands occur in the coastal fog zone adjacent to stands of the *Pseudotsuga menziesii* and *Pseudotsuga menziesii*-*Notholithocarpus densiflorus* alliances. The range of the plant is more extensive than is the alliance.

Local Vegetation Description

The Hazelnut scrub Alliance forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is open. Dominant and characteristic shrubs include *Corylus cornuta*, *Holodiscus discolor*, *Rubus ursinus*, *Sambucus racemosa*, and *Toxicodendron diversilobum*, and those that are often present include *Baccharis pilularis*, *Frangula californica*, and *Rubus parviflorus*. Commonly associated emergent trees at sparse cover include *Quercus agrifolia* and *Umbellularia californica*. The herbaceous layer typically includes *Polystichum munitum*, and herbs that are often present include *Heracleum maximum*, *Marah fabaceus*, *Pteridium aquilinum*, *Sanicula crassicaulis*, *Stachys bullata*, and *Urtica dioica*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	2.0	0 – 6	10.0	5 – 15
Regenerating or Shrubby Tree	0.2	0.0 – 1.0	3.9	0.5 – 10
Shrub	77.0	60.0 – 90.0	3.5	2 – 5
Herb	8.5	3 – 23	0.4	0 – 1

Local Membership Rule

Corylus cornuta dominates or co-dominates with *Baccharis pilularis* and other shrubs as a medium-tall scrub on steep concave slopes with northern to eastern exposures surrounded by *Pseudotsuga menziesii*. Other shrubs may include *Baccharis pilularis*, *Frangula californica*, *Rubus ursinus*, *Vaccinium ovatum*, and *Toxicodendron diversilobum*. Stands occur in the southern portion of Inverness Ridge.

Local Environmental Description

Elevation: Mean 355 m, Range 110 – 509 m

Aspect: NE (3), NW (1)

Slope: Mean 27 degrees, Range 22 – 35 degrees

Macro Topography: Middle to Upper 1/3 of slope (2), Upper 1/3 of slope (1), Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: Mean 0.7%, Range 0.0 – 2.2%

Fines Cover: Mean 6.7%, Range 0.0 – 10.0%

Litter Cover: Mean 89.0%, Range 85.0 – 97%

Soil Texture (field assessed): Moderately fine silty clay loam (1), Unknown (1), Moderately coarse, sandy loam (1), Coarse, loamy sand (1)

Geology (field or map data): Granitic (2), Granitic (generic) (2), Mixed metamorphic (1), Sandstone (1)

San Mateo County Watersheds: Pacifica (4), Half Moon Bay (2)

Site Impacts

This alliance has very low non-native plant cover (average 0.7%) relative to native cover.

Non-native species that occur with highest frequency and abundance include *Hypochaeris radicata*, *Myosotis latifolia*, and *Plantago lanceolata*.

Associations in San Mateo County

- *Corylus cornuta* / *Polystichum munitum*

Classification Comments

None.

References: Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: G3 **State Rarity Rank:** S2?

Surveys Used for Description

Total: N=6; San Mateo County (n=6): PGA751, PWNMC03A, SMAT0016, SMAT0067, SMAT0087, SMAT0671

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	33.3	19.4	0.8	1	4				
	<i>Umbellularia californica</i>	33.3	19.4	0.5	1	2				
Shrub	<i>Corylus cornuta</i>	100.0	40.1	32.1	15	50	Y		Y	Y
	<i>Rubus ursinus</i>	100.0	4.5	4.4	0.2	15	Y			Y
	<i>Holodiscus discolor</i>	83.3	18.3	14.2	0.2	40	Y			Y
	<i>Toxicodendron diversilobum</i>	83.3	14.2	11.4	0.2	30	Y			Y
	<i>Sambucus racemosa</i>	83.3	7.4	5.7	0.2	20	Y			Y
	<i>Frangula californica</i>	66.7	4.1	4.0	1	20				Y
	<i>Rubus parviflorus</i>	66.7	0.5	0.3	0.2	1				Y
	<i>Baccharis pilularis</i>	50.0	1.5	1.2	0.2	5				Y
	<i>Vaccinium ovatum</i>	33.3	1.8	1.0	3	3				
	<i>Ribes sanguineum</i>	33.3	0.9	0.7	1	3				
	<i>Diplacus aurantiacus</i>	33.3	0.1	0.1	0.2	0.2				
Herb	<i>Polystichum munitum</i>	100.0	34.3	5.2	0.2	20	Y		Y	Y
	<i>Pteridium aquilinum</i>	66.7	15.9	1.5	1	3				Y
	<i>Heracleum maximum</i>	66.7	6.0	0.6	0.2	2				Y
	<i>Marah fabaceus</i>	66.7	3.3	0.3	0.2	1				Y
	<i>Urtica dioica</i>	50.0	4.8	0.4	0.2	2				Y
	<i>Stachys bullata</i>	50.0	1.8	0.1	0.2	0.2				Y

Corylus cornuta var. *californica* Shrubland Alliance

<i>Sanicula crassicaulis</i>	50.0	1.8	0.1	0.2	0.2		Y
<i>Dryopteris arguta</i>	33.3	4.1	0.3	1	1		
<i>Maianthemum racemosum</i>	33.3	3.3	0.2	0.2	1		
<i>Scoliopus bigelovii</i>	33.3	1.1	0.1	0.2	0.2		
<i>Iris douglasiana</i>	33.3	1.1	0.1	0.2	0.2		
<i>Scrophularia californica</i>	33.3	1.6	0.1	0.2	0.2		
<i>Vicia gigantea</i>	33.3	0.8	0.1	0.2	0.2		
<i>Maianthemum stellatum</i>	33.3	1.1	0.1	0.2	0.2		
Non-Vascular							
Lichen	33.3	32.3	1.3	3	5		

***Corylus cornuta* / *Polystichum munitum* Association**

Common Name: Hazel / Western Sword Fern Shrubland

Alliance: *Corylus cornuta* var. *californica* Shrubland Alliance

Classification Comments

The association circumscription is the same as that of the alliance for the county. See above for detailed description.

References: Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: G2

State Rarity Rank: S2?

State Rare: Y

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	33.3	19.4	0.8	1	4				
	<i>Umbellularia californica</i>	33.3	19.4	0.5	1	2				
Shrub	<i>Corylus cornuta</i>	100.0	40.1	32.1	15	50			Y	Y
	<i>Rubus ursinus</i>	100.0	4.5	4.4	0.2	15				Y
	<i>Holodiscus discolor</i>	83.3	18.3	14.2	0.2	40				Y
	<i>Toxicodendron diversilobum</i>	83.3	14.2	11.4	0.2	30				Y
	<i>Sambucus racemosa</i>	83.3	7.4	5.7	0.2	20				Y
	<i>Frangula californica</i>	66.7	4.1	4.0	1	20				Y
	<i>Rubus parviflorus</i>	66.7	0.5	0.3	0.2	1				Y
	<i>Baccharis pilularis</i>	50.0	1.5	1.2	0.2	5				Y
	<i>Vaccinium ovatum</i>	33.3	1.8	1.0	3	3				
	<i>Ribes sanguineum</i>	33.3	0.9	0.7	1	3				
	<i>Diplacus aurantiacus</i>	33.3	0.1	0.1	0.2	0.2				
Herb	<i>Polystichum munitum</i>	100.0	34.3	5.2	0.2	20			Y	Y
	<i>Pteridium aquilinum</i>	66.7	15.9	1.5	1	3				Y
	<i>Heracleum maximum</i>	66.7	6.0	0.6	0.2	2				Y
	<i>Marah fabaceus</i>	66.7	3.3	0.3	0.2	1				Y
	<i>Urtica dioica</i>	50.0	4.8	0.4	0.2	2				Y
	<i>Sanicula crassicaulis</i>	50.0	1.8	0.1	0.2	0.2				Y
	<i>Stachys bullata</i>	50.0	1.8	0.1	0.2	0.2				Y
	<i>Dryopteris arguta</i>	33.3	4.1	0.3	1	1				
	<i>Maianthemum racemosum</i>	33.3	3.3	0.2	0.2	1				

Corylus cornuta var. *californica* Shrubland Alliance

	<i>Scrophularia californica</i>	33.3	1.6	0.1	0.2	0.2
	<i>Maianthemum stellatum</i>	33.3	1.1	0.1	0.2	0.2
	<i>Iris douglasiana</i>	33.3	1.1	0.1	0.2	0.2
	<i>Scoliopus bigelovii</i>	33.3	1.1	0.1	0.2	0.2
	<i>Vicia gigantea</i>	33.3	0.8	0.1	0.2	0.2
Non-Vascular						
	Lichen	33.3	32.3	1.3	3	5

***Cytisus scoparius* – *Genista monspessulana* – *Cotoneaster* spp. Shrubland Semi- Natural Alliance**



Common Name: Broom patches

NVC Alliance Code: A2062. *Cytisus scoparius* - *Ulex europaeus* Coastal Ruderal Scrub Alliance

Statewide Description

Cytisus scoparius, *Genista monspessulana*, *Spartium junceum*, *Ulex europaeus* or other broom species are dominant in the shrub canopy. Additionally, stands of *Cotoneaster lacteus*, *Cotoneaster pannosus*, *Pyracantha*, or other Mediterranean shrubs may be dominant and are also placed in this alliance. Emergent trees may be present at low cover.

Cytisus scoparius, Scotch broom, has a Cal-IPC rank of High and a CDFA list of C. It has 5-angled stems, few leaves, and bright yellow to maroon flowers. Stands occur throughout northern cismontane California. The typical variety with yellow flowers (var. *scoparius*) is joined along the Northern California Coast (263A) with var. *andreas*, with brownish-red wing petals and yellow standard (DiTomaso and Healy 2007).

Genista monspessulana, French broom, has a Cal-IPC rank of High and a CDFA list of C. It has 8-10- ridged stems, leafy branches, and small clusters of yellow flowers. Stands occur throughout cismontane California. Many stands on the Central California Coast (261A) are hybrids with *G. canariensis* or *G. stenopetala* (DiTomaso and Healy 2007).

Local Vegetation Description

The Broom patches Alliance forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is sparse to open. Dominant shrubs may include *Genista monspessulana*, *Hypericum canariense*, and *Ulex europaeus*. and characteristic shrubs include *Baccharis pilularis*, *Rubus ursinus*, and *Toxicodendron diversilobum*. Commonly associated emergent trees at sparse cover include *Hesperocyparis macrocarpa*, *Eucalyptus globulus*, *Pinus radiata*, *Pseudotsuga menziesii*, and *Quercus wislizeni*. Herbs that are sometimes present include *Achillea millefolium*, *Aira caryophyllea*, *Anagallis arvensis*, *Carduus pycnocephalus*, *Centaureum muehlenbergii*, *Chlorogalum pomeridianum*, *Clinopodium douglasii*, *Conium maculatum*, *Cortaderia jubata*, *Delairea odorata*, *Dryopteris arguta*, *Eriophyllum stoechadifolium*, *Heracleum maximum*, *Iris douglasiana*, *Juncus patens*, *Marah fabaceus*, *Sanicula crassicaulis*, *Scrophularia californica*, *Sonchus asper*, *Stachys bullata*, and *Symphotrichum chilense*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	2.0	0 – 7	7.5	5 – 10
Hardwood	0.6	0 – 3	3.5	2 – 5
Regenerating or Shrubby Tree	0.0	0.0 – 0.2	1.5	1 – 2
Shrub	80.0	65.0 – 85.0	2.0	1 – 5
Herb	2.8	0 – 5	0.3	0 – 0.5

Local Membership Rule

Cistus spp., *Cotoneaster* spp., *Cytisus scoparius*, *Genista monspessulana*, *Ulex europaeus*, or other broom plants dominate in the shrub overstory. Fire promotes invasions in woodland settings; however, broom or other non-native Mediterranean scrub may invade coastal grasslands without fire.

Local Environmental Description

Elevation: Mean 166 m, Range 18 – 466 m

Aspect: SW (3), SE (1)

Slope: Mean 8 degrees, Range 0 – 15 degrees

Macro Topography: Lower 1/3 of slope (1), Middle 1/3 of slope (1), Ridge top (1), Upper 1/3 of slope to Ridgetop (1)

Large Rock: Mean 1.3%, Range 0.0 – 5.0%

Small Rock: Mean 1.4%, Range 0.0 – 5.0%

Fines Cover: Mean 18.0%, Range 3.0 – 57.0%

Litter Cover: Mean 74.0%, Range 40.0 – 94%

Soil Texture (field assessed): Medium loam (1), Medium sand (1), Medium to very fine, sandy loam (1), Coarse, loamy sand (1)

Geology (field or map data): Sandstone (1), Sandstone and other sedimentary (1), Mixed metamorphic (1), Metamorphic (type unknown) (1), Franciscan melange (1)

San Mateo County Watersheds: Ano Nuevo (2), Half Moon Bay (1), San Francisco

Coastal (1), San Mateo Bayside (1)

Site Impacts

This alliance has greater cover of exotics than natives, non-native plant cover averages 83.5% relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira caryophyllea*, *Anagallis arvensis*, *Carduus pycnocephalus*, *Conium maculatum*, *Cortaderia jubata*, *Delairea odorata*, *Eucalyptus globulus*, *Genista monspessulana*, *Hypericum canariense*, *Rubus armeniacus*, *Sonchus asper*, and *Ulex europaeus*.

Associations in San Mateo County

- *Genista monspessulana*
- *Hypericum canariens*
- *Ulex europaeus*

Classification Comments

None.

References: Evens and Kentner 2006

Global Rarity Rank: GNA **State Rarity Rank:** SNA

Surveys Used for Description

Total: N=5; San Mateo County (n=5): PGA1763, SMAT0030, SMAT0044, SMAT0054, SMAT0322

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Hesperocyparis macrocarpa</i>	60.0	39.4	1.8	1	7				Y
	<i>Pinus radiata</i>	40.0	20.0	0.4	1	1				
	<i>Pseudotsuga menziesii</i>	20.0	10.0	0.0	0.2	0.2				
	<i>Eucalyptus globulus</i>	20.0	0.6	0.0	0.2	0.2				
	<i>Quercus wislizeni</i>	20.0	10.0	0.0	0.2	0.2				
	Regenerating or Shrubby Trees	<i>Pseudotsuga menziesii</i>	20.0	20.0	0.0	0.2	0.2			
Shrub										

	<i>Baccharis pilularis</i>	100.0	8.3	6.0	2	20	Y	Y
	<i>Rubus ursinus</i>	80.0	2.5	1.8	0.2	5	Y	Y
	<i>Toxicodendron diversilobum</i>	80.0	0.8	0.6	0.2	1	Y	Y
	<i>Frangula californica</i>	60.0	0.7	0.6	0.2	2		Y
	<i>Hypericum canariense</i>	40.0	37.4	32.0	80	80		
	<i>Genista monspessulana</i>	40.0	30.2	24.0	40	80		
	<i>Heteromeles arbutifolia</i>	40.0	0.5	0.4	0.2	2		
	<i>Ulex europaeus</i>	20.0	18.2	16.6	83	83		
	<i>Acacia spp.</i>	20.0	0.7	0.6	3	3		
	<i>Rubus armeniacus</i>	20.0	0.2	0.2	1	1		
	<i>Sambucus racemosa</i>	20.0	0.2	0.2	1	1		
	<i>Lonicera involucrata</i>	20.0	0.1	0.0	0.2	0.2		
	<i>Oemleria cerasiformis</i>	20.0	0.0	0.0	0.2	0.2		
	<i>Lonicera hispidula</i>	20.0	0.1	0.0	0.2	0.2		
Herb								
	<i>Heracleum maximum</i>	40.0	8.2	0.2	0.2	1		
	<i>Sanicula crassicaulis</i>	40.0	16.7	0.2	0.2	1		
	<i>Dryopteris arguta</i>	40.0	12.9	0.1	0.2	0.2		
	<i>Chlorogalum pomeridianum</i>	40.0	2.9	0.1	0.2	0.2		
	<i>Delairea odorata</i>	20.0	7.7	0.2	1	1		
	<i>Stachys bullata</i>	20.0	1.3	0.0	0.2	0.2		
	<i>Iris douglasiana</i>	20.0	1.5	0.0	0.2	0.2		
	<i>Marah fabaceus</i>	20.0	1.3	0.0	0.2	0.2		
	<i>Sonchus asper</i>	20.0	1.5	0.0	0.2	0.2		
	<i>Symphotrichum chilense</i>	20.0	2.9	0.0	0.2	0.2		
	<i>Scrophularia californica</i>	20.0	1.5	0.0	0.2	0.2		
	<i>Juncus patens</i>	20.0	2.9	0.0	0.2	0.2		
	<i>Conium maculatum</i>	20.0	1.5	0.0	0.2	0.2		
	<i>Cortaderia jubata</i>	20.0	2.9	0.0	0.2	0.2		
	<i>Clinopodium douglasii</i>	20.0	1.3	0.0	0.2	0.2		
	<i>Centaurium muehlenbergii</i>	20.0	2.9	0.0	0.2	0.2		
	<i>Carduus pycnocephalus</i>	20.0	1.5	0.0	0.2	0.2		
	<i>Anagallis arvensis</i>	20.0	2.9	0.0	0.2	0.2		
	<i>Aira caryophyllea</i>	20.0	2.9	0.0	0.2	0.2		
	<i>Achillea millefolium</i>	20.0	1.3	0.0	0.2	0.2		
	<i>Eriophyllum stoechadifolium</i>	20.0	1.5	0.0	0.2	0.2		

***Genista monspessulana* Semi-natural Association**

Common Name: French Broom Shrubland

Alliance: *Cytisus scoparius* – *Genista monspessulana* – *Cotoneaster* spp. Shrubland
Semi-Natural Alliance

Local Vegetation Description

The French Broom Association forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is sparse to open. Dominant and characteristic shrubs include *Genista monspessulana* and *Baccharis pilularis*, and those that are often present include *Toxicodendron diversilobum*.

Commonly associated emergent trees at sparse cover include *Quercus agrifolia*. Herbs that are sometimes present include *Briza maxima*, *Chlorogalum pomeridianum*, *Cirsium vulgare*, *Cynosurus echinatus*, and *Holcus lanatus*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	3.5	0 – 7	no data	no data
Hardwood	1.5	0 – 3	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	75.0	65.0 – 85.0	1.5	1 – 2
Herb	2.5	0 – 5	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 251 m, Range 36 – 466 m

Aspect: SE (1)

Slope: 5 degrees (1)

Macro Topography: Upper 1/3 of slope to Ridgetop (1)

Large Rock: 5.0%

Small Rock: 5.0%

Fines Cover: 5.0%

Litter Cover: 72%

Soil Texture (field assessed): Coarse, loamy sand (1)

Geology (field or map data): Franciscan melange (1), Mixed metamorphic (1)

San Mateo County Watersheds: Half Moon Bay (1), San Francisco Coastal (1)

Site Impacts

This association has greater cover of exotics (average 72.5%) than natives. Non-native species that occur with highest frequency and abundance include *Briza maxima*, *Cirsium vulgare*, *Cynosurus echinatus*, *Genista monspessulana*, and *Holcus lanatus*.

Classification Comments

Genista monspessulana Semi-natural Association
Cytisus scoparius – *Genista monspessulana* – *Cotoneaster* spp. Shrubland Semi-Natural Alliance

None.

References: Evens and Kentner 2006

Global Rarity Rank: GNA

State Rarity Rank: SNA

State Rare: N

Surveys Used for Description

Total: N=2; San Mateo County (n=2): PGA1763, SMAT0054

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Hesperocyparis macrocarpa</i>	50.0	48.6	3.5	7	7				Y
	<i>Eucalyptus globulus</i>	50.0	1.4	0.1	0.2	0.2				Y
Regenerating or Shrubby Trees	<i>Quercus agrifolia</i> *	50	16.7	0.1	0.2	0.2				Y
	<i>Quercus kelloggii</i> *	50	16.7	0.1	0.2	0.2				Y
	<i>Umbellularia californica</i> *50		16.7	0.1	0.2	0.2				Y
Shrub	<i>Genista monspessulana</i>	100.0	75.6	60.0	40	80		Y		Y
	<i>Baccharis pilularis</i>	100.0	16.8	11.5	3	20				Y
	<i>Rubus ursinus</i>	50.0	3.8	2.5	5	5				Y
	<i>Acacia spp.</i>	50.0	1.7	1.5	3	3				Y
	<i>Heteromeles arbutifolia</i>	50.0	1.1	1.0	2	2				Y
	<i>Toxicodendron diversilobum</i>	50.0	0.8	0.5	1	1				Y
	<i>Lonicera hispidula</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Lonicera involucrata</i>	50.0	0.2	0.1	0.2	0.2				Y
Herb	<i>Sanicula crassicaulis</i>	50.0	16.7	0.5	1	1				Y
	<i>Heracleum maximum</i>	50.0	16.7	0.5	1	1				Y
	<i>Marah fabaceus</i>	50.0	3.3	0.1	0.2	0.2				Y
	<i>Clinopodium douglasii</i>	50.0	3.3	0.1	0.2	0.2				Y
	<i>Stachys bullata</i>	50.0	3.3	0.1	0.2	0.2				Y
	<i>Achillea millefolium</i>	50.0	3.3	0.1	0.2	0.2				Y
	<i>Chlorogalum</i>	50.0	3.3	0.1	0.2	0.2				Y

Genista monspessulana Semi-natural Association

Cytisus scoparius – *Genista monspessulana* – *Cotoneaster* spp. Shrubland Semi-Natural Alliance

pomeridianum

***Hypericum canariense* Provisional Semi-natural Association**

Common Name: Canary Island St. Johnswort Shrubland

Alliance: *Cytisus scoparius* – *Genista monspessulana* – *Cotoneaster* spp. Shrubland
Semi-Natural Alliance

Local Vegetation Description

The Canary Island St. Johnswort Association forms a continuous shrub layer. The emergent tree layer is typically sparse, and the herbaceous layer is sparse to open. *Hypericum canariense* is the dominant shrub. Other characteristic shrubs include *Baccharis pilularis*, *Frangula californica*, *Rubus ursinus*, and *Toxicodendron diversilobum*. Commonly associated emergent trees at sparse cover include *Hesperocyparis macrocarpa* and *Pinus radiata*. Herbs contribute little cover, but *Dryopteris arguta* is present in both stands.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	1.1	0.2 – 2	7.5	5 – 10
Hardwood	0.1	0 – .2	3.5	2 – 5
Regenerating or Shrubby Tree	0.1	0 – 0.2	1.5	1 – 2
Shrub	82.5	80 – 85	2.5	1 – 5
Herb	2.6	0.2 – 5	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 46 m, Range 18 – 76 m

Aspect: SW (2)

Slope: Mean 6 degrees, Range 0 – 12 degrees

Macro Topography: Middle 1/3 of slope (1), Lower 1/3 of slope (1)

Large Rock: Mean 0%, Range 0 – 0%

Small Rock: Mean 0.1%, Range 0 – 0.2%

Fines Cover: Mean 5.0%, Range 3 – 7%

Litter Cover: Mean 92.0%, Range 90 – 94%

Soil Texture (field assessed): Medium loam (1), Medium sand (1)

Geology (field or map data): Sandstone and other sedimentary (2)

San Mateo County Watersheds: Ano Nuevo (2)

Site Impacts

This association has greater cover of exotics (average 91.6%) than natives. Non-native species that occur with highest frequency and abundance include *Hesperocyparis macrocarpa*, *Hypericum canariense*, and *Pinus radiata*.

Classification Comments

Hypericum canariense Provisional Semi-natural Association
Cytisus scoparius – *Genista monspessulana* – *Cotoneaster* spp. Shrubland Semi-Natural Alliance

This association is newly described here and is considered provisional since it is under-sampled in its expected range.

References: none

Global Rarity Rank: GNA

State Rarity Rank: SNA

State Rare: N

Surveys Used for Description

Total: N=2; San Mateo County (n=2): SMAT0044, SMAT0322

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus wislizeni</i>	50.0	25.0	0.1	0.2	0.2				Y
	<i>Hesperocyparis macrocarpa</i>	50.0	25.0	0.5	1	1				Y
	<i>Pseudotsuga menziesii</i>	50.0	25.0	0.1	0.2	0.2				Y
	<i>Pinus radiata</i>	50.0	25.0	0.5	1	1				Y
	Regenerating or Shrubby Trees	<i>Pseudotsuga menziesii</i>	50.0	50.0	0.1	0.2	0.2			
Shrub	<i>Hypericum canariense</i>	100.0	93.6	80.0	80	80		Y		Y
	<i>Baccharis pilularis</i>	100.0	2.9	2.5	2	3				Y
	<i>Rubus ursinus</i>	100.0	1.9	1.6	0.2	3				Y
	<i>Frangula californica</i>	100.0	0.7	0.6	0.2	1				Y
	<i>Toxicodendron diversilobum</i>	100.0	0.7	0.6	0.2	1				Y
	<i>Oemleria cerasiformis</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Heteromeles arbutifolia</i>	50.0	0.1	0.1	0.2	0.2				Y
Herb	<i>Dryopteris arguta</i>	100.0	32.1	0.2	0.2	0.2			Y	Y
	<i>Sanicula crassicaulis</i>	50.0	25.0	0.1	0.2	0.2				Y
	<i>Juncus patens</i>	50.0	7.1	0.1	0.2	0.2				Y
	<i>Anagallis arvensis</i>	50.0	7.1	0.1	0.2	0.2				Y
	<i>Cortaderia jubata</i>	50.0	7.1	0.1	0.2	0.2				Y
	<i>Symphotrichum chilense</i>	50.0	7.1	0.1	0.2	0.2				Y
	<i>Aira caryophyllea</i>	50.0	7.1	0.1	0.2	0.2				Y
	<i>Centaurium</i>	50.0	7.1	0.1	0.2	0.2				Y

Hypericum canariense Provisional Semi-natural Association

Cytisus scoparius – *Genista monspessulana* – *Cotoneaster* spp. Shrubland Semi-Natural Alliance

muehlenbergii

***Ulex europaeus* Provisional Semi-natural Association**

Common Name: Common Gorse Ruderal Shrubland

Alliance: *Cytisus scoparius* – *Genista monspessulana* – *Cotoneaster* spp. Shrubland
Semi-Natural Alliance

Local Vegetation Description

The Common Gorse Ruderal Shrubland Association forms a continuous shrub layer in the single sample available. The emergent tree layer is typically sparse to open, and the herbaceous layer is open.

Dominant and characteristic shrubs include *Ulex europaeus*, and those that are often present include *Baccharis pilularis* and *Rubus ursinus*. Herbs that are often present include *Conium maculatum* and *Holcus lanatus*, and herbs that are sometimes present include *Carex* spp., *Chlorogalum pomeridianum*, *Hypochaeris radicata*, *Iris douglasiana*, *Juncus patens*, *Plantago lanceolata*, and *Scrophularia californica*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	1.0	NA	7.5	5 – 10
Hardwood	0.0	NA	no data	no data
Regenerating or Shrubby Tree	0.0	NA	no data	no data
Shrub	85.0	NA	1.5	1 – 2
Herb	4.0	NA	0.3	0 – 0.5

Local Environmental Description

Elevation: 237 m

Aspect: SW (1)

Slope: 15 degrees

Macro Topography: Ridge top (1)

Large Rock: 0.0%

Small Rock: 0.2%

Fines Cover: 57.0%

Litter Cover: 40%

Soil Texture (field assessed): Medium to very fine, sandy loam (1)

Geology (field or map data): Metamorphic (type unknown) (1)

San Mateo County Watersheds: San Mateo Bayside (1)

Site Impacts

This association has greater cover of exotics (average 89.5%) than natives. Non-native species that occur with highest frequency and abundance include *Conium maculatum*, *Holcus lanatus*, *Hypochaeris radicata*, *Plantago lanceolata*, and *Ulex europaeus*.

Ulex europaeus Provisional Semi-natural Association

Cytisus scoparius – *Genista monspessulana* – *Cotoneaster* spp. Shrubland Semi-Natural Alliance

Classification Comments

This association has been newly placed in this alliance. It originally was described in a Gorse Alliance in Point Reyes (Keeler-Wolf et al. 2003a). The association is considered provisional since it is under- sampled in its expected range.

References: Keeler-Wolf et al. 2003a

Global Rarity Rank: GNA

State Rarity Rank: SNA

State Rare: N

Surveys Used for Description

Total: N=1; San Mateo County (n=1): SMAT0030

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree										
	<i>Hesperocyparis macrocarpa</i>	100.0	50.0	1.0	1	1		Y		Y
	<i>Pinus radiata</i>	100.0	50.0	1.0	1	1		Y		Y
Regenerating or Shrubby Trees										
	<i>Quercus agrifolia</i> *	50	16.7	0.1	0.2	0.2				Y
	<i>Quercus kelloggii</i> *	50	16.7	0.1	0.2	0.2				Y
	<i>Umbellularia californica</i> *50	50	16.7	0.1	0.2	0.2				Y
Shrub										
	<i>Ulex europaeus</i>	100.0	91.2	83.0	83	83		Y		Y
	<i>Frangula californica</i>	100.0	2.2	2.0	2	2				Y
	<i>Baccharis pilularis</i>	100.0	2.2	2.0	2	2				Y
	<i>Sambucus racemosa</i>	100.0	1.1	1.0	1	1				Y
	<i>Rubus ursinus</i>	100.0	1.1	1.0	1	1				Y
	<i>Toxicodendron diversilobum</i>	100.0	1.1	1.0	1	1				Y
	<i>Rubus armeniacus</i>	100.0	1.1	1.0	1	1				Y
Herb										
	<i>Delairea odorata</i>	100.0	38.5	1.0	1	1			Y	Y
	<i>Iris douglasiana</i>	100.0	7.7	0.2	0.2	0.2				Y
	<i>Carduus pycnocephalus</i>	100.0	7.7	0.2	0.2	0.2				Y
	<i>Eriophyllum</i>	100.0	7.7	0.2	0.2	0.2				Y

Ulex europaeus Provisional Semi-natural Association

Cytisus scoparius – *Genista monspessulana* – *Cotoneaster* spp. Shrubland Semi-Natural Alliance

<i>stoechadifolium</i>					
<i>Heracleum maximum</i>	100.07.7	0.2	0.2	0.2	Y
<i>Conium maculatum</i>	100.07.7	0.2	0.2	0.2	Y
<i>Sonchus asper</i>	100.07.7	0.2	0.2	0.2	Y
<i>Scrophularia californica</i>	100.07.7	0.2	0.2	0.2	Y
<i>Chlorogalum pomeridianum</i>	100.07.7	0.2	0.2	0.2	Y

***Diplacus aurantiacus* Shrubland Alliance**



Common Name: Bush monkeyflower scrub

NVC Alliance Code: A2672. *Dendromecon rigida* - *Diplacus aurantiacus* - *Eriodictyon californicum* Scrub Alliance

Statewide Description

Diplacus aurantiacus or *Diplacus parviflorus* is dominant in the shrub canopy with *Artemisia californica*, *Baccharis pilularis*, *Ceanothus megacarpus*, *Ceanothus spinosus*, *Eriogonum cinereum*, *Heteromeles arbutifolia*, *Malosma laurina*, *Salvia leucophylla*, *Salvia mellifera*, *Sambucus nigra* and *Toxicodendron diversilobum*. Emergent trees may be present at low cover, including *Juglans californica*, *Platanus racemosa* or *Quercus agrifolia*.

Diplacus aurantiacus is a widespread plant in many coastal scrub, chaparral, and woodland alliances (Rundel 2007), but the presence of stands primarily dominated by this species leaves little doubt that this is a distinct type. The alliance appears on generally steep, often somewhat unstable slopes in relatively mesic settings within the general vicinity of recent burns and stands of *Artemisia californica*, *Quercus agrifolia*, or *Salvia leucophylla* alliances. In some cases, this type also appears to be associated with natural ground disturbances, such as rockslides (Keeler-Wolf and Evens 2006) and road cuts.

Local Vegetation Description

The Bush monkeyflower scrub Alliance forms an intermittent shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is open to intermittent. Dominant and characteristic shrubs include *Diplacus aurantiacus* and *Baccharis pilularis*, and those that are often present include *Toxicodendron diversilobum*. Commonly associated emergent trees at sparse cover include *Pseudotsuga menziesii*. Herbs that are often present include *Anagallis arvensis*, *Logfia gallica*, *Pteridium aquilinum*, and *Vulpia myuros*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	5.0	5 – 5	12.5	10 – 15
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.1	0.0 – 0.4	3.5	2 – 5
Shrub	52.5	45 – 60	0.9	0 – 2
Herb	34.0	10 – 62	0.3	0 – 0.5

Local Membership Rule

Diplacus aurantiacus dominates often on steep slopes and ridgetops. Other coastal scrub may be present at lower cover. If *D. aurantiacus* is co-dominant with *Adenostoma fasciculatum* or *Artemisia californica*, see those respective alliances.

Local Environmental Description

Elevation: Mean 246 m, Range 80 – 530 m

Aspect: SW (2), W (1)

Slope: Mean 17 degrees, Range 15 – 18 degrees

Macro Topography: Ridge top (2), Upper 1/3 of slope (1)

Large Rock: Mean 2.1%, Range 0.2 – 4.0%

Small Rock: Mean 35.5%, Range 1.0 – 70.0%

Fines Cover: 10.0%

Litter Cover: Mean 46.0%, Range 6.0 – 86%

Soil Texture (field assessed): Coarse, loamy sand (1), Medium to very fine, sandy loam (1)

Geology (field or map data): Franciscan melange (1), Granitic (generic) (1), Sandstone and other sedimentary (1)

San Mateo County Watersheds: Pacifica (1)

Other Watersheds, Marin Co.: Bolinas (2)

Site Impacts

This alliance has low non-native plant cover (average 4.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Brassica nigra*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Cortaderia jubata*, *Foeniculum vulgare*, *Holcus lanatus*, *Hypochaeris radicata*, *Logfia gallica*, *Plantago lanceolata*, *Rumex acetosella*, *Sonchus asper*, and *Vulpia myuros*.

Ulex europaeus Provisional Semi-natural Association

Cytisus scoparius – *Genista monspessulana* – *Cotoneaster* spp. Shrubland Semi-Natural Alliance

Associations in San Mateo County

- *Diplacus (aurantiacus, puniceus)*

Classification Comments

Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: Buck-Diaz et al. 2012, Keeler-Wolf and Evens 2006, Kittel et al. 2012

Global Rarity Rank: G3

State Rarity Rank: S3?

Surveys Used for Description

Total: N=3; San Mateo County (n=1): SMAT0088

Marin County (n=2): MARINSP18, WRBL014

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft	
Tree	<i>Pseudotsuga menziesii</i>	33.3	33.3	1.7	5	5					
	<i>Pseudotsuga menziesii</i>	33.3	16.7	0.1	0.2	0.2					
Regenerating or Shrubby Trees	<i>Quercus agrifolia</i>	33.3	16.7	0.1	0.2	0.2					
	<i>Quercus agrifolia</i>	33.3	16.7	0.1	0.2	0.2					
Shrub	<i>Diplacus aurantiacus</i>	100.0	62.4	38.7	28	50	Y	Y		Y	
	<i>Baccharis pilularis</i>	100.0	24.7	15.3	10	20	Y			Y	
	<i>Toxicodendron diversilobum</i>	66.7	6.2	4.7	4.2	10				Y	
	<i>Frangula californica</i>	33.3	5.0	5.0	15	15					
	<i>Rubus ursinus</i>	33.3	1.7	1.7	5	5					
	<i>Rubus ursinus</i>	33.3	1.7	1.7	5	5					
Herb	<i>Logfia gallica</i>	66.7	3.0	1.1	0.2	3				Y	
	<i>Pteridium aquilinum</i>	66.7	9.3	1.0	1	2				Y	
	<i>Vulpia myuros</i>	66.7	4.3	0.4	0.2	1				Y	
	<i>Anagallis arvensis</i>	66.7	0.9	0.1	0.2	0.2				Y	
	<i>Artemisia pycnocephala</i>	33.3	29.4	18.7	56	56					
	<i>Festuca idahoensis</i>	33.3	19.3	6.7	20	20					
	<i>Agrostis hallii</i>	33.3	2.9	1.0	3	3					
	<i>Ulex europaeus</i>										
	<i>Cytisus scoparius</i>										

Ulex europaeus Provisional Semi-natural Association

Cytisus scoparius – *Genista monspessulana* – *Cotoneaster* spp. Shrubland Semi-Natural Alliance

<i>Eriogonum latifolium</i>	33.3	2.9	1.0	3	3
<i>Dipsacus</i> spp.	33.3	1.6	1.0	3	3
<i>Eriophyllum</i> <i>stoechadifolium</i>	33.3	2.9	1.0	3	3
<i>Scrophularia californica</i>	33.3	8.3	0.7	2	2
<i>Foeniculum vulgare</i>	33.3	0.6	0.4	1.2	1.2
<i>Bromus hordeaceus</i>	33.3	4.2	0.3	1	1
<i>Eschscholzia californica</i>	33.3	0.5	0.2	0.5	0.5
<i>Dudleya farinosa</i>	33.3	0.5	0.2	0.5	0.5
<i>Hypochaeris radicata</i>	33.3	0.5	0.2	0.5	0.5
<i>Viola</i> spp.	33.3	0.1	0.1	0.2	0.2
<i>Melilotus</i> spp.	33.3	0.1	0.1	0.2	0.2
<i>Phacelia californica</i>	33.3	0.8	0.1	0.2	0.2
<i>Stachys ajugoides</i>	33.3	0.1	0.1	0.2	0.2
<i>Madia sativa</i>	33.3	0.1	0.1	0.2	0.2
<i>Solanum umbelliferum</i>	33.3	0.8	0.1	0.2	0.2
<i>Sonchus asper</i>	33.3	0.1	0.1	0.2	0.2
<i>Rumex acetosella</i>	33.3	0.8	0.1	0.2	0.2
<i>Plantago lanceolata</i>	33.3	0.1	0.1	0.2	0.2
<i>Marah fabaceus</i>	33.3	0.8	0.1	0.2	0.2
<i>Lolium perenne</i>	33.3	0.1	0.1	0.2	0.2
<i>Anaphalis margaritacea</i>	33.3	0.8	0.1	0.2	0.2
<i>Grindelia stricta</i>	33.3	0.1	0.1	0.2	0.2
<i>Festuca occidentalis</i>	33.3	0.1	0.1	0.2	0.2
<i>Elymus glaucus</i>	33.3	0.1	0.1	0.2	0.2
<i>Cortaderia</i> spp.	33.3	0.1	0.1	0.2	0.2
<i>Cortaderia jubata</i>	33.3	0.8	0.1	0.2	0.2
<i>Clinopodium douglasii</i>	33.3	0.8	0.1	0.2	0.2
<i>Carduus pycnocephalus</i>	33.3	0.1	0.1	0.2	0.2
<i>Cardamine oligosperma</i>	33.3	0.8	0.1	0.2	0.2
<i>Brassica nigra</i>	33.3	0.1	0.1	0.2	0.2
<i>Holcus lanatus</i>	33.3	0.8	0.1	0.2	0.2

Diplacus (aurantiacus, puniceus) Association

Common Name: Bush Monkeyflower Shrubland

Alliance: *Diplacus aurantiacus* Shrubland Alliance

Classification Comments

The association circumscription is the same as that of the alliance for the county. See above for detailed description.

References: Buck-Diaz et al. 2012, Keeler-Wolf and Evens 2006, Kittel et al. 2012

Global Rarity Rank: G3

State Rarity Rank: S3

State Rare: Y

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree										
	<i>Pseudotsuga menziesii</i>	33.3	33.3	1.7	5	5				
Regenerating or Shrubby Trees										
	<i>Quercus agrifolia</i>	33.3	16.7	0.1	0.2	0.2				
	<i>Pseudotsuga menziesii</i>	33.3	16.7	0.1	0.2	0.2				
Shrub										
	<i>Diplacus aurantiacus</i>	100.0	62.4	38.7	28	50		Y		Y
	<i>Baccharis pilularis</i>	100.0	24.7	15.3	10	20				Y
	<i>Toxicodendron diversilobum</i>	66.7	6.2	4.7	4.2	10				Y
	<i>Frangula californica</i>	33.3	5.0	5.0	15	15				
	<i>Rubus ursinus</i>	33.3	1.7	1.7	5	5				
Herb										
	<i>Pteridium aquilinum</i>	66.7	9.3	1.0	1	2				Y
	<i>Vulpia myuros</i>	66.7	4.3	0.4	0.2	1				Y
	<i>Logfia gallica</i>	66.7	3.0	1.1	0.2	3				Y
	<i>Anagallis arvensis</i>	66.7	0.9	0.1	0.2	0.2				Y
	<i>Artemisia pycnocephala</i>	33.3	29.4	18.7	56	56				
	<i>Festuca idahoensis</i>	33.3	19.3	6.7	20	20				
	<i>Scrophularia californica</i>	33.3	8.3	0.7	2	2				
	<i>Bromus hordeaceus</i>	33.3	4.2	0.3	1	1				
	<i>Agrostis hallii</i>	33.3	2.9	1.0	3	3				

Ulex europaeus Provisional Semi-natural Association

Cytisus scoparius – *Genista monspessulana* – *Cotoneaster* spp. Shrubland Semi-Natural Alliance

<i>Eriophyllum</i>					
<i>stoechadifolium</i>	33.3	2.9	1.0	3	3
<i>Eriogonum latifolium</i>	33.3	2.9	1.0	3	3
<i>Dipsacus spp.</i>	33.3	1.6	1.0	3	3
<i>Solanum umbelliferum</i>	33.3	0.8	0.1	0.2	0.2
<i>Phacelia californica</i>	33.3	0.8	0.1	0.2	0.2
<i>Holcus lanatus</i>	33.3	0.8	0.1	0.2	0.2
<i>Marah fabaceus</i>	33.3	0.8	0.1	0.2	0.2
<i>Cortaderia jubata</i>	33.3	0.8	0.1	0.2	0.2
<i>Rumex acetosella</i>	33.3	0.8	0.1	0.2	0.2
<i>Clinopodium douglasii</i>	33.3	0.8	0.1	0.2	0.2
<i>Anaphalis margaritacea</i>	33.3	0.8	0.1	0.2	0.2
<i>Cardamine oligosperma</i>	33.3	0.8	0.1	0.2	0.2
<i>Foeniculum vulgare</i>	33.3	0.6	0.4	1.2	1.2
<i>Dudleya farinosa</i>	33.3	0.5	0.2	0.5	0.5
<i>Hypochaeris radicata</i>	33.3	0.5	0.2	0.5	0.5
<i>Eschscholzia californica</i>	33.3	0.5	0.2	0.5	0.5
<i>Sonchus asper</i>	33.3	0.1	0.1	0.2	0.2
<i>Festuca occidentalis</i>	33.3	0.1	0.1	0.2	0.2
<i>Brassica nigra</i>	33.3	0.1	0.1	0.2	0.2
<i>Lolium perenne</i>	33.3	0.1	0.1	0.2	0.2
<i>Madia sativa</i>	33.3	0.1	0.1	0.2	0.2
<i>Stachys ajugoides</i>	33.3	0.1	0.1	0.2	0.2
<i>Grindelia stricta</i>	33.3	0.1	0.1	0.2	0.2
<i>Plantago lanceolata</i>	33.3	0.1	0.1	0.2	0.2
<i>Carduus pycnocephalus</i>	33.3	0.1	0.1	0.2	0.2
<i>Melilotus spp.</i>	33.3	0.1	0.1	0.2	0.2
<i>Cortaderia spp.</i>	33.3	0.1	0.1	0.2	0.2
<i>Elymus glaucus</i>	33.3	0.1	0.1	0.2	0.2
<i>Viola spp.</i>	33.3	0.1	0.1	0.2	0.2

***Frangula californica* – *Rhododendron occidentale* – *Salix breweri* Shrubland Alliance**



Common Name: California coffee berry – western azalea – Brewer's willow scrub
NVC Alliance Code: N/A.

Statewide Description

The nominate species of the alliance were given separate alliance status in Sawyer et al. (2009). Recent peer reviewers of the NVC merged them into a single alliance; the new convention is followed here.

Frangula californica, *Rhododendron occidentale*, and/or *Salix breweri* dominates or co-dominates in the shrub canopy with *Baccharis pilularis*, *Calycanthus occidentalis*, *Corylus cornuta*, *Ericameria pinifolia*, *Eriogonum wrightii*, *Frangula purshiana*, *Garrya veitchii*, *Hoita macrostachya*, *Malus fusca*, *Oemleria cerasiformis*, *Prunus virginiana*, *Ribes roezlii*, *Rubus parviflorus*, *Sambucus nigra*, and *Toxicodendron diversilobum*. Emergent trees may be present at low cover, including *Abies grandis*, *Alnus rubra*, *Picea sitchensis*, *Pseudotsuga menziesii*, *Quercus agrifolia*, *Quercus chrysolepis*, or *Tsuga heterophylla*.

Frangula californica is a morphologically variable and widespread species. It has six subspecies, which have somewhat different ranges but similar ecologies. While upland stands of *Frangula californica* occur on both north- and south-facing slopes along the coast from Big Sur to Point Reyes (Ford and Hayes 2007), only those riparian stands are included in this alliance. Similarly, *Rhododendron occidentale* is a common shrub along streams, seeps, and moist slopes at low to montane elevations throughout most of

cismontane California. Those riparian and spring stands are included in this alliance. More narrowly distributed is *Salix breweri*, where it is restricted to streams and seeps. These three indicator species typically dominate or co-dominate on ultramafic (e.g., serpentine) substrates.

Local Vegetation Description

The California coffee berry – western azalea – Brewer's willow scrub Alliance forms an open to intermittent shrub layer. The emergent tree layer is typically sparse, and the herbaceous layer is open to intermittent. Dominant and characteristic shrubs include *Frangula californica*. Commonly associated emergent trees at sparse cover include *Quercus agrifolia*. The herbaceous layer typically includes *Lolium perenne*, *Cirsium fontinale*, *Juncus* spp., and *Juncus xiphioides*, and herbs that are often present include *Achillea millefolium*, *Eschscholzia californica*, *Hemizonia congesta*, *Mimulus guttatus*, and *Polypogon monspeliensis*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.3	0 – 1	7.5	5 – 10
Regenerating or Shrubby Tree	0.0	0.0 – 0.0	no data	no data
Shrub	27.3	12.0 – 40.0	3.5	2 – 5
Herb	43.8	25 – 60	0.8	0.5 – 1

Local Membership Rule

Frangula californica and/or *Rhododendron occidentale* dominate or co-dominate with *Rubus*. Stands are found along springs, seeps, and ravines in wetland and riparian settings, often on sedimentary and serpentine substrates that retain water much of the year. If *Frangula californica* is dominant in upland settings along with *Baccharis pilularis* or other upland plants, key to the *Baccharis* alliance.

Local Environmental Description

Elevation: Mean 312 m, Range 167 – 605 m

Aspect: SW (2), Variable (1), Flat (1)

Slope: Mean 12 degrees, Range 0 – 20 degrees

Macro Topography: Bottom (3), Lower to Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 1.7%, Range 0.0 – 5.0%

Litter Cover: Mean 1.5%, Range 0.0 – 6%

Soil Texture (field assessed): Muck (1), Unknown (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Serpentine (3), Franciscan melange (1)

San Mateo County Watersheds: None.

Other Watersheds, Marin Co.: Lagunitas Creek (1); **Santa Clara Co.:** Coyote Creek (3)

Site Impacts

Frangula californica – *Rhododendron occidentale* – *Salix breweri* Shrubland Alliance

This alliance has moderate non-native plant cover (average 23.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aegilops triuncialis*, *Bromus hordeaceus*, *Centaurea solstitialis*, *Cirsium vulgare*, *Lactuca saligna*, *Polypogon monspeliensis*, *Polypogon viridis*, and *Rumex pulcher*.

Associations in San Mateo County

None determined

Classification Comments

Though no samples were surveyed in San Mateo County, this alliance is known from nearby counties and is likely to occur here. This sensitive alliance would benefit from more sampling along springs and seeps.

References: Klein et al. 2015

Global Rarity Rank: G3

State Rarity Rank: S3

Surveys Used for Description

Total: N=4; San Mateo County (n=0): n/a Marin County (n=1): MMWD0109

Santa Clara County (n=3): SCLAR054, SCLAR068, SCLAR083

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

***Gaultheria shallon* – *Rubus (ursinus)* Shrubland Alliance**



Common Name: Salal – berry brambles

NVC Alliance Code: N/A (new).

Statewide Description

Rubus parviflorus, *Rubus ursinus*, *Holodiscus discolor*, or *Gaultheria shallon* dominates solely or co- dominate, forming various mixtures in the shrub canopy with *Baccharis pilularis*, *Garrya elliptica*, *Gaultheria shallon*, *Heracleum maximum*, *Lonicera involucrata*, *Marah oreganus*, *Morella californica*, *Ribes menziesii*, *Sambucus racemosa*, *Toxicodendron diversilobum*, and *Vaccinium ovatum*. Emergent trees may be present at low cover, including *Picea sitchensis*, *Pinus muricata*, or *Pseudotsuga menziesii*.

The nominate species of this alliance were segregated from the previous *Rubus* spp. Alliance in Sawyer et al. (2009) based on peer review of the NVC and interpretation of California data. The new convention is followed here: Stands, which were previously thought to be part of a mixed *Rubus* Alliance (Sawyer et al. 2009), have recently been reconsidered as two different alliances (*Morella californica* – *Rubus spectabilis* and *Gaultheria shallon* – *Rubus (ursinus)* Provisional Alliances). *Holodiscus discolor*, *Rubus ursinus* and *Gaultheria shallon* are widespread shrubs found in mesic woodlands and forests in the coastal areas of central and northern California. These species tend to emerge from forest or woodland cover on exposed coastal bluffs or in coastal grasslands.

Local Vegetation Description

The Salal – berry brambles Alliance forms an open to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is sparse to continuous. Dominant and characteristic shrubs include *Rubus ursinus*, *Baccharis pilularis*, and *Toxicodendron diversilobum*, and those that are often present include *Frangula californica*. Herbs that are often present include *Heracleum maximum*, *Polystichum munitum*, *Scrophularia californica*, and herbs that are sometimes present include *Dryopteris arguta*, *Eriophyllum stoechadifolium*, *Iris douglasiana*, *Marah fabaceus*, *Pteridium aquilinum*, *Stachys bullata*, *Symphotrichum chilense*, and *Urtica dioica*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.8	0 – 10	no data	no data
Regenerating or Shrubby Tree	0.3	0.0 – 5.0	no data	no data
Shrub	80.4	20 – 100	1.6	0 – 5
Herb	15.2	1 – 70	0.6	0 – 2

Local Membership Rule

Gaultheria shallon, *Rubus parviflorus*, and/or *Rubus ursinus* dominate or co-dominate with *Anthoxanthum odoratum*, *Baccharis pilularis*, *Holcus lanatus*, or *Toxicodendron diversilobum* on hillslopes, rock outcrops, coastal bluffs, or flats.

Local Environmental Description

Elevation: Mean 216 m, Range 9 – 543 m

Aspect: NW (5), NE (4), SE (3), SW (2), Flat (1), Variable (1)

Slope: Mean 21 degrees, Range 0 – 70 degrees

Macro Topography: Upper 1/3 of slope (5), Middle 1/3 of slope (5), Bench (2), Bottom (1), Bottom to Lower 1/3 of slope (1), Middle to Upper 1/3 of slope (1), Ridge top (1)

Large Rock: Mean 0.0%, Range 0.0 – 0.0%

Small Rock: Mean 0.5%, Range 0.0 – 5.0%

Fines Cover: Mean 18.2%, Range 5.0 – 57.0%

Litter Cover: Mean 73.5%, Range 30.0 – 91%

Soil Texture (field assessed): Moderately coarse, sandy loam (4), Loam, (class unknown) (3), Coarse, loamy sand (2), Medium loam (2), Not recorded (1), Clay, (class unknown) (1), Coarse sand (1), Medium to very fine, loamy sand (1), Muck (1)

Geology (field or map data): Sandstone and other sedimentary (4), Franciscan melange (3), Sandstone, shale, and conglomerate (3), Granitic (generic) (3), Mixed metamorphic (1), Mixed sedimentary (1), Sandstone (1), Alluvium (1), Sandy alluvium (most alluvial fans and washes) (1), Volcanic and metavolcanic rocks (1), Granitic (1)

San Mateo County Watersheds: Pacifica (5), Pescadero Creek (5), Ano Nuevo (3), Half Moon Bay (3), San Mateo Bayside (3), San Francisco Bayside (1)

Gaultheria shallon – *Rubus (ursinus)* Shrubland Alliance

<i>Marah fabaceus</i>	40.0	4.9	0.5	0.2	3
<i>Urtica dioica</i>	30.0	2.4	0.4	0.2	3
<i>Symphyotrichum chilense</i>	30.0	1.3	0.1	0.2	1
<i>Dryopteris arguta</i>	25.0	8.4	0.6	0.2	5
<i>Pteridium aquilinum</i>	25.0	0.9	0.1	0.2	1
<i>Stachys bullata</i>	20.0	2.0	0.3	0.2	6
<i>Iris douglasiana</i>	20.0	0.4	0.1	0.2	0.5

***Holodiscus discolor* – *Baccharis pilularis* – *Rubus ursinus* Association**

Common Name: Ocean Spray – Coyote Brush – California Blackberry Shrubland

Alliance: *Gaultheria shallon* – *Rubus (ursinus)* Shrubland Alliance

Local Vegetation Description

The Ocean Spray – Coyote Brush – California Blackberry Association forms a continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is open. Dominant and characteristic shrubs include *Holodiscus discolor*, *Baccharis pilularis*, *Rubus ursinus*, and *Toxicodendron diversilobum*, and those that are often present include *Frangula californica*, *Oemleria cerasiformis*, and *Sambucus racemosa*. Commonly associated emergent trees at sparse cover include *Umbellularia californica*. Herbs that are often present include *Dryopteris arguta*, *Heracleum maximum*, *Stachys bullata*, and *Scrophularia californica*, and herbs that are sometimes present include *Eriophyllum stoechadifolium*, *Maianthemum racemosum*, *Marah fabaceus*, and *Polystichum munitum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	3.3	0 – 10	no data	no data
Regenerating or Shrubby Tree	1.2	0 – 5.0	no data	no data
Shrub	82.3	75.0 – 90.0	2.8	1 – 5
Herb	7.3	3 – 16	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 316 m, Range 256 – 393 m

Aspect: NE (1), NW (1), SE (1)

Slope: Mean 25 degrees, Range 21 – 29 degrees

Macro Topography: Ridge top (1), Middle 1/3 of slope (1), Middle to Upper 1/3 of slope (1)

Large Rock: Mean 0.0%, Range 0.0 – 0.0%

Small Rock: Mean 0.5%, Range 0.2 – 1.0%

Fines Cover: Mean 7.5%, Range 5.0 – 10.0%

Litter Cover: Mean 68.3%, Range 30 – 90%

Soil Texture (field assessed): Moderately coarse, sandy loam (2), Coarse, loamy sand (1)

Geology (field or map data): Granitic (generic) (1), Mixed metamorphic (1), Franciscan melange (1), Sandstone, shale, and conglomerate (1)

San Mateo County Watersheds: Half Moon Bay (2), Pacifica (1), San Mateo Bayside (1)

Holodiscus discolor – *Baccharis pilularis* – *Rubus ursinus* Association
Gaultheria shallon – *Rubus (ursinus)* Shrubland Alliance

Site Impacts

This association has very low non-native plant cover (average 0.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Cerastium glomeratum* and *Sonchus asper*.

Classification Comments

The association name *Baccharis pilularis* – *Holodiscus discolor* was used in the 2003 classification for Point Reyes, and placed in the *Baccharis pilularis* Alliance. Additional data and analysis have led us to lump that concept into this new association.

References: Keeler-Wolf et al. 2003a

Global Rarity Rank: G3

State Rarity Rank: S3?

State Rare: Y

Surveys Used for Description

Total: N=4; San Mateo County (n=4): GGNRA337, PGA996, SMAT0066, SMAT0072

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Umbellularia californica</i>	50.0	30.0	0.8	1	2				Y
	<i>Quercus agrifolia</i>	25.0	20.0	2.0	8	8				
Regenerating or Shrubby Trees	<i>Umbellularia californica</i>	25.0	20.0	1.0	4	4				
	<i>Quercus agrifolia</i>	25.0	5.0	0.3	1	1				
Shrub	<i>Holodiscus discolor</i>	100.0	55.6	46.3	20	70		Y		Y
	<i>Rubus ursinus</i>	75.0	9.6	16.8	0.2	65				Y
	<i>Baccharis pilularis</i>	75.0	8.7	12.8	5	41				Y
	<i>Toxicodendron diversilobum</i>	75.0	7.9	8.8	2	23				Y
	<i>Oemleria cerasiformis</i>	50.0	8.4	5.1	0.2	20				Y
	<i>Frangula californica</i>	50.0	2.5	4.3	1	16				Y
	<i>Sambucus racemosa</i>	50.0	1.5	1.3	2	3				Y
	<i>Diplacus aurantiacus</i>	25.0	1.9	3.5	14	14				
	<i>Corylus cornuta</i>	25.0	1.5	1.3	5	5				
	<i>Vaccinium ovatum</i>	25.0	1.5	1.3	5	5				

Holodiscus discolor – *Baccharis pilularis* – *Rubus ursinus* Association
Gaultheria shallon – *Rubus (ursinus)* Shrubland Alliance

	<i>Rubus parviflorus</i>	25.0	0.3	0.3	1	1	
	<i>Ceanothus thyrsiflorus</i>	25.0	0.3	0.3	1	1	
	<i>Lonicera hispidula</i>	25.0	0.3	0.5	2	2	
Herb							
	<i>Dryopteris arguta</i>	50.0	33.2	2.0	3	5	Y
	<i>Heracleum maximum</i>	50.0	11.8	1.8	1	6	Y
	<i>Stachys bullata</i>	50.0	9.0	1.6	0.2	6	Y
	<i>Scrophularia californica</i>	50.0	6.2	0.5	1	1	Y
	<i>Polystichum munitum</i>	25.0	10.4	0.8	3	3	
	<i>Eriophyllum stoechadifolium</i>	25.0	8.3	1.5	6	6	
	<i>Maianthemum racemosum</i>	25.0	8.2	0.8	3	3	
	<i>Marah fabaceus</i>	25.0	2.7	0.3	1	1	
	<i>Sonchus asper</i>	25.0	0.7	0.1	0.2	0.2	
	<i>Anaphalis margaritacea</i>	25.0	0.7	0.1	0.2	0.2	
	<i>Juncus spp.</i>	25.0	0.7	0.1	0.2	0.2	
	<i>Maianthemum spp.</i>	25.0	0.7	0.1	0.2	0.2	
	<i>Barbarea orthoceras</i>	25.0	0.7	0.1	0.2	0.2	
	<i>Cardamine oligosperma</i>	25.0	0.7	0.1	0.2	0.2	
	<i>Iris douglasiana</i>	25.0	0.7	0.1	0.2	0.2	
	<i>Marah oreganus</i>	25.0	0.7	0.1	0.2	0.2	
	<i>Sanicula crassicaulis</i>	25.0	0.7	0.1	0.2	0.2	
	<i>Cerastium glomeratum</i>	25.0	0.7	0.1	0.2	0.2	
	<i>Maianthemum stellatum</i>	25.0	0.5	0.1	0.2	0.2	
	<i>Actaea rubra</i>	25.0	0.5	0.1	0.2	0.2	
	<i>Pteridium aquilinum</i>	25.0	0.5	0.1	0.2	0.2	
	<i>Urtica dioica</i>	25.0	0.5	0.1	0.2	0.2	
	<i>Thalictrum fendleri</i>	25.0	0.5	0.1	0.2	0.2	
	<i>Galium aparine</i>	25.0	0.5	0.1	0.2	0.2	
Non-Vascular							
	Lichen	50.0	41.7	0.8	1	2	Y
	Moss	25.0	8.3	0.3	1	1	

***Rubus parviflorus* Association**

Common Name: Western Thimbleberry Shrubland

Alliance: *Gaultheria shallon* – *Rubus (ursinus)* Shrubland Alliance

Local Vegetation Description

The Western Thimbleberry Association forms an intermittent to continuous shrub layer. The emergent tree layer is typically absent, and the herbaceous layer is open. Dominant and characteristic shrubs include *Rubus parviflorus*, *Baccharis pilularis*, and *Toxicodendron diversilobum*, and those that are often present include *Frangula californica*. The herbaceous layer typically includes *Heracleum maximum*, *Marah fabaceus*, *Scrophularia californica*, and *Urtica dioica*, and herbs that are often present include *Polystichum munitum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	78.0	60.0 – 92.0	1.6	0 – 5
Herb	8.8	3 – 21	0.7	0 – 2

Local Environmental Description

Elevation: Mean 303 m, Range 20 – 535 m

Aspect: NE (2), NW (2), Variable (1)

Slope: Mean 22 degrees, Range 5 – 43 degrees

Macro Topography: Upper 1/3 of slope (3), Middle 1/3 of slope (1), Bottom to Lower 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: Mean 1.0%, Range 0.0 – 5.0%

Fines Cover: Mean 16.4%, Range 5.0 – 50.0%

Litter Cover: Mean 78.8%, Range 40.0 – 91%

Soil Texture (field assessed): Medium loam (2), Moderately coarse, sandy loam (2), Medium to very fine, loamy sand (1)

Geology (field or map data): Granitic (generic) (2), Mixed sedimentary (1), Volcanic and metavolcanic rocks (1), Sandstone, shale, and conglomerate (1)

San Mateo County Watersheds: Pacifica (3), Half Moon Bay (1), Pescadero Creek (1)

Site Impacts

This association has low non-native plant cover (average 1.5%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Delairea*

odorata.

Classification Comments

This association was previously placed in the *Rubus (parviflorus, spectabilis, ursinus)* Alliance (Sawyer et al. 2009) and in the *Morella californica – Rubus spectabilis* Alliance (Klein et al. 2015) but is now being placed here since it primarily occurs in upland forest edges and coastal scrub situations.

References: Belsher 1999, Klein et al. 2015

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=5; San Mateo County (n=5): SMAT0065, SMAT0074, SMAT0106, SMAT0176, SMAT0673

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Rubus parviflorus</i>	100.0	62.2	52.0	30	65		Y		Y
	<i>Toxicodendron diversilobum</i>	100.0	16.4	12.6	0.2	20				Y
	<i>Baccharis pilularis</i>	100.0	8.5	6.2	0.2	10				Y
	<i>Frangula californica</i>	60.0	0.8	0.5	0.2	2				Y
	<i>Rubus ursinus</i>	40.0	4.9	5.0	10	15				
	<i>Sambucus racemosa</i>	40.0	4.6	5.0	5	20				
	<i>Salix lasiolepis</i>	40.0	1.8	2.0	0.2	10				
Herb	<i>Heracleum maximum</i>	100.0	36.3	4.8	0.2	15			Y	Y
	<i>Scrophularia californica</i>	100.0	12.7	1.2	1	2				Y
	<i>Marah fabaceus</i>	100.0	10.0	1.3	0.2	3				Y
	<i>Urtica dioica</i>	80.0	8.5	1.1	0.2	3				Y
	<i>Polystichum munitum</i>	60.0	2.5	0.3	0.2	1				Y
	<i>Dryopteris arguta</i>	40.0	6.6	0.6	0.2	3				
	<i>Maianthemum stellatum</i>	40.0	3.9	0.6	0.2	3				
	<i>Pteridium aquilinum</i>	40.0	2.3	0.2	0.2	1				
	<i>Eriophyllum stoechadifolium</i>	40.0	1.5	0.2	0.2	1				
	<i>Galium aparine</i>	40.0	0.7	0.1	0.2	0.2				
	<i>Stachys bullata</i>	40.0	0.6	0.1	0.2	0.2				
	<i>Symphotrichum chilense</i>	40.0	0.6	0.1	0.2	0.2				

Rubus parviflorus Association
Gaultheria shallon – Rubus (ursinus) Shrubland Alliance

***Rubus ursinus* Association**

Common Name: California Blackberry Shrubland

Alliance: *Gaultheria shallon* – *Rubus (ursinus)* Shrubland Alliance

Local Vegetation Description

The California Blackberry Association forms an open to continuous shrub layer. The emergent tree layer is typically absent, and the herbaceous layer is sparse to continuous. Dominant and characteristic shrubs include *Rubus ursinus*, *Baccharis pilularis*, and *Toxicodendron diversilobum*, and those that are often present include *Frangula californica*. Herbs that are often present include *Polystichum munitum*, and herbs that are sometimes present include *Carex barbarae*, *Cirsium vulgare*, *Clinopodium douglasii*, *Eriophyllum stoechadifolium*, *Heracleum maximum*, *Iris douglasiana*, *Scrophularia californica*, *Symphotrichum chilense*, and *Vulpia bromoides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	81.1	20.0 – 100.0	1.1	0 – 2
Herb	22.3	1 – 70	0.8	0 – 2

Local Environmental Description

Elevation: Mean 141 m, Range 9 – 543 m

Aspect: NW (2), SW (2), SE (2), Flat (1), NE (1)

Slope: Mean 19 degrees, Range 0 – 70 degrees

Macro Topography: Middle 1/3 of slope (3), Upper 1/3 of slope (2), Bench (2), Bottom (1)

Large Rock: 0.0%

Small Rock: Mean 0.0%, Range 0.0 – 0.2%

Fines Cover: Mean 24.3%, Range 5.0 – 57.0%

Litter Cover: Mean 71.7%, Range 40.0 – 91%

Soil Texture (field assessed): Loam, (class unknown) (3), Not recorded (1), Coarse, loamy sand (1), Coarse sand (1), Clay, (class unknown) (1), Muck (1)

Geology (field or map data): Sandstone and other sedimentary (4), Franciscan melange (2), Sandstone, shale, and conglomerate (1), Sandy alluvium (most alluvial fans and washes) (1), Sandstone (1), Granitic (1), Alluvium (1)

San Mateo County Watersheds: Pescadero Creek (4), Ano Nuevo (3), San Mateo Bayside (2), Pacifica (1)

Rubus ursinus Association
Gaultheria shallon – *Rubus (ursinus)* Shrubland Alliance

Other Watersheds, San Francisco Co.: San Francisco Bayside (1)

Site Impacts

This association has low non-native plant cover (average 6.9%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Cirsium vulgare* and *Vulpia bromoides*.

Classification Comments

This association was previously placed in the *Rubus (parviflorus, spectabilis, ursinus)* Alliance (Sawyer et al. 2009).

References: Duebendorfer 1989, Klein et al. 2015

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=11; San Mateo County (n=10): BOPO145, PGA724, PWNMC01A, SMAT0147, SMAT0318, WRBL063, WRBL065, WRBL069, WRBL071, WRBL117
 San Francisco County (n=1): SMAT0230

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Rubus ursinus</i>	100.0	67.3	50.6	20	87.5		Y		Y
	<i>Toxicodendron diversilobum</i>	90.9	14.4	11.6	0.5	40				Y
	<i>Baccharis pilularis</i>	81.8	9.6	7.1	1	20				Y
	<i>Frangula californica</i>	54.5	6.2	4.9	0.2	20				Y
Herb	<i>Polystichum munitum</i>	54.5	9.0	0.7	0.2	4				Y
	<i>Eriophyllum stoechadifolium</i>	45.5	9.6	1.7	0.2	10				
	<i>Scrophularia californica</i>	45.5	7.3	1.2	0.2	10.9				
	<i>Heracleum maximum</i>	36.4	4.4	0.5	0.2	5.4				
	<i>Symphotrichum chilense</i>	36.4	2.0	0.2	0.2	1				
	<i>Carex barbarae</i>	27.3	18.9	5.5	0.5	40				
	<i>Clinopodium douglasii</i>	27.3	4.9	0.6	0.5	3				
	<i>Vulpia bromoides</i>	27.3	1.9	0.2	0.2	1				
	<i>Iris douglasiana</i>	27.3	0.5	0.1	0.2	0.5				
	<i>Cirsium vulgare</i>	27.3	0.4	0.1	0.2	0.5				

***Lotus scoparius* – *Lupinus albifrons* – *Eriodictyon* spp. Shrubland Alliance**



Common Name: Deer weed – silver bush lupine – yerba santa scrub

NVC Alliance Code: A3886. *Lotus scoparius* - *Lupinus albifrons* Scrub Alliance

Statewide Description

Lotus scoparius or *Lupinus albifrons*, *Eriodictyon californicum* or another *Eriodictyon* sp. is dominant or co-dominant in the shrub canopy with *Adenostoma fasciculatum*, *Artemisia californica*, *Baccharis pilularis*, *Ephedra californica*, *Ericameria linearifolia*, *Eriodictyon californicum*, *Eriogonum fasciculatum*, *Hazardia squarrosa*, *Malacothamnus densiflorus*, *Prunus fremontii*, *Rhus ovata*, *Ribes quercetorum* and *Salvia apiana*.

Lotus scoparius, *Lupinus albifrons*, and *Eriodictyon californicum* are early colonizing shrubs of disturbed sites throughout much of central and southern California. Stands of the alliance dominate recently burned patches of chaparral and coastal scrub (e.g., *Adenostoma fasciculatum*, *Artemisia californica*, and *Eriogonum fasciculatum* alliances).

Local Vegetation Description

The Deer weed – silver bush lupine – yerba santa scrub Alliance forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse, and the herbaceous layer is sparse to open. Dominant and characteristic shrubs include *Lotus scoparius*, *Baccharis pilularis*, and *Rubus ursinus*, and those that are often present include *Ceanothus thyrsiflorus*, *Diplacus aurantiacus*, *Eriodictyon californicum*,

Lotus scoparius – *Lupinus albifrons* – *Eriodictyon* spp. Shrubland Alliance

Frangula californica, and *Toxicodendron diversilobum*. Commonly associated emergent trees at sparse cover include *Quercus agrifolia* and *Umbellularia californica*. The herbs that are often present include *Avena* spp., *Bromus diandrus*, *Heracleum maximum*, *Marah fabaceus*, *Pseudognaphalium* spp., *Rumex acetosella*, *Scrophularia californica*, *Silene gallica*, *Stachys bullata*, and *Vulpia myuros*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.1	0 – 0.2	3.5	2 – 5
Regenerating or Shrubby Tree	0.1	0.0 – 0.2	1.5	1 – 2
Shrub	70.0	55.0 – 80.0	1.3	0.5 – 2
Herb	5.3	1 – 10	0.4	0 – 1

Local Membership Rule

Eriodictyon californicum, *Lotus scoparius*, *Pickeringia montana*, or *Lupinus albifrons* dominates or co-dominates with other seral scrub, often in stands that are open and/or display recent evidence of fire or other disturbance such as road cuts. Other coastal scrub may be present at lower cover, including *Artemisia californica*, *Baccharis pilularis*, and *Toxicodendron diversilobum*. The understory may be composed of mixed native and non-natives that sometimes have higher cover than the overstory shrubs.

Local Environmental Description

Elevation: Mean 369 m, Range 114 – 598 m

Aspect: NE (1), NW (1), SW (1)

Slope: Mean 20 degrees, Range 6 – 45 degrees

Macro Topography: Ridge top (2), Upper 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: Mean 2.4%, Range 0.2 – 5.0%

Fines Cover: Mean 18.3%, Range 5.0 – 45.0%

Litter Cover: Mean 72.3%, Range 31.0 – 92%

Soil Texture (field assessed): Moderately coarse, sandy loam (3)

Geology (field or map data): Sedimentary (type unknown) (1), Sandstone, shale, and conglomerate (1), Granitic (generic) (1), Sandstone (1)

San Mateo County Watersheds: San Mateo Bayside (2), Pacifica (1), Pescadero Creek (1)

Site Impacts

This alliance has low non-native plant cover (average 7.2%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Brassica nigra*, *Bromus diandrus*, *Centaurea melitensis*, *Cortaderia jubata*, *Cynosurus echinatus*, *Gastroidium phleoides*, *Hypochaeris glabra*, *Logfia gallica*, *Polygonum aviculare*, *Rumex acetosella*, *Silene gallica*, *Sonchus asper*, *Spergularia rubra*, *Vulpia bromoides*, and *Vulpia myuros*.

Lotus scoparius – *Lupinus albifrons* – *Eriodictyon* spp. Shrubland Alliance

Associations in San Mateo County

- *Eriodictyon californicum* / herbaceous
- *Lotus scoparius*

Classification Comments

None.

References: AECOM 2013, Buck-Diaz and Evens 2011a, Buck-Diaz and Evens 2011b, Buck-Diaz et al. 2011, Buck-Diaz et al. 2012, Buck-Diaz et al. 2013, CNPS Vegetation Program 2015, Evens and San 2005, Evens et al. 2004, Evens et al. 2006, Keeler-Wolf and Evens 2006, Keeler-Wolf et al. 2003b, Kittel et al. 2012, Klein et al. 2007, Klein et al. 2015, Sproul et al. 2011

Global Rarity Rank: G5

State Rarity Rank: S5

Surveys Used for Description

Total: N=4; San Mateo County (n=4): SMAT0064, SMAT0156, SMAT0259, YERBA06

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	25.0	12.5	0.1	0.2	0.2				
	<i>Umbellularia californica</i>	25.0	12.5	0.1	0.2	0.2				
Regenerating or Shrubby Trees	<i>Quercus parvula</i> var. <i>shrevei</i>	25.0	25.0	0.1	0.2	0.2				
Shrub	<i>Lotus scoparius</i>	75.0	47.7	14.6	0.2	50	Y		Y	Y
	<i>Baccharis pilularis</i>	75.0	13.2	11.3	0.2	25	Y			Y
	<i>Rubus ursinus</i>	75.0	1.0	0.8	0.2	2	Y			Y
	<i>Eriodictyon californicum</i>	50.0	30.5	26.3	45	60				Y
	<i>Frangula californica</i>	50.0	2.3	2.0	3	5				Y
	<i>Ceanothus thyrsiflorus</i>	50.0	1.5	1.3	0.2	5				Y
	<i>Diplacus aurantiacus</i>	50.0	0.7	0.6	0.2	2				Y
	<i>Toxicodendron diversilobum</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Arctostaphylos crustacea</i>	25.0	1.4	0.8	3	3				
	<i>Ribes malvaceum</i>	25.0	0.3	0.3	1	1				

Lotus scoparius – *Lupinus albifrons* – *Eriodictyon* spp. Shrubland Alliance

	<i>Rubus parviflorus</i>	25.0	0.3	0.3	1	1	
	<i>Adenostoma fasciculatum</i>	25.0	0.1	0.1	0.2	0.2	
	<i>Sambucus spp.</i>	25.0	0.1	0.1	0.2	0.2	
	<i>Salix lasiolepis</i>	25.0	0.6	0.1	0.2	0.2	
	<i>Ribes spp.</i>	25.0	0.1	0.1	0.2	0.2	
	<i>Lepechinia calycina</i>	25.0	0.1	0.1	0.2	0.2	
	<i>Vaccinium ovatum</i>	25.0	0.1	0.1	0.2	0.2	
Herb							
	<i>Rumex acetosella</i>	50.0	5.2	0.8	0.2	3	Y
	<i>Stachys bullata</i>	50.0	12.8	0.5	1	1	Y
	<i>Vulpia myuros</i>	50.0	4.8	0.3	0.2	1	Y
	<i>Avena spp.</i>	50.0	2.4	0.3	0.2	1	Y
	<i>Scrophularia californica</i>	50.0	5.7	0.3	0.2	1	Y
	<i>Heracleum maximum</i>	50.0	2.6	0.1	0.2	0.2	Y
	<i>Silene gallica</i>	50.0	1.2	0.1	0.2	0.2	Y
	<i>Pseudognaphalium spp.</i>	50.0	2.6	0.1	0.2	0.2	Y
	<i>Marah fabaceus</i>	50.0	2.6	0.1	0.2	0.2	Y
	<i>Bromus diandrus</i>	50.0	1.2	0.1	0.2	0.2	Y
	<i>Lessingia germanorum</i>	25.0	11.9	2.0	8	8	
	<i>Pteridium aquilinum</i>	25.0	11.7	0.8	3	3	
	<i>Chorizanthe cuspidata</i>	25.0	4.5	0.8	3	3	
	<i>Vulpia bromoides</i>	25.0	4.5	0.3	1	1	
	<i>Polygonum aviculare</i>	25.0	0.9	0.1	0.2	0.2	
	<i>Pseudognaphalium californicum</i>	25.0	0.9	0.1	0.2	0.2	
	<i>Camissonia spp.</i>	25.0	0.3	0.1	0.2	0.2	
	<i>Conyza canadensis</i>	25.0	0.3	0.1	0.2	0.2	
	<i>unknown Poaceae</i>	25.0	1.8	0.1	0.2	0.2	
	<i>Brassica nigra</i>	25.0	0.3	0.1	0.2	0.2	
	<i>Centaurea melitensis</i>	25.0	0.9	0.1	0.2	0.2	
	<i>Sonchus asper</i>	25.0	1.8	0.1	0.2	0.2	
	<i>Spergularia rubra</i>	25.0	0.9	0.1	0.2	0.2	
	<i>Artemisia douglasiana</i>	25.0	1.8	0.1	0.2	0.2	
	<i>Stephanomeria spp.</i>	25.0	0.9	0.1	0.2	0.2	
	<i>Anagallis arvensis</i>	25.0	0.9	0.1	0.2	0.2	
	<i>Sanicula crassicaulis</i>	25.0	1.8	0.1	0.2	0.2	
	<i>Erodium spp.</i>	25.0	0.3	0.1	0.2	0.2	
	<i>Cortaderia jubata</i>	25.0	0.3	0.1	0.2	0.2	
	<i>Dryopteris arguta</i>	25.0	1.8	0.1	0.2	0.2	
	<i>Phacelia californica</i>	25.0	0.8	0.1	0.2	0.2	
	<i>Eschscholzia californica</i>	25.0	0.3	0.1	0.2	0.2	
	<i>Eurybia radulina</i>	25.0	0.9	0.1	0.2	0.2	
	<i>Gastroidium phleoides</i>	25.0	0.9	0.1	0.2	0.2	
	<i>Clinopodium douglasii</i>	25.0	0.8	0.1	0.2	0.2	
	<i>Iris douglasiana</i>	25.0	0.8	0.1	0.2	0.2	
	<i>Logfia gallica</i>	25.0	0.9	0.1	0.2	0.2	
	<i>Lolium perenne</i>	25.0	0.9	0.1	0.2	0.2	

Lotus scoparius – *Lupinus albifrons* – *Eriodictyon* spp. Shrubland Alliance

	<i>Navarretia squarrosa</i>	25.0	0.9	0.1	0.2	0.2
	<i>Madia gracilis</i>	25.0	0.9	0.1	0.2	0.2
	<i>Nassella lepida</i>	25.0	0.9	0.1	0.2	0.2
	<i>Cynosurus echinatus</i>	25.0	0.9	0.1	0.2	0.2
	<i>Hypochaeris glabra</i>	25.0	0.9	0.1	0.2	0.2
Non-Vascular						
	Moss	25.0	25.0	0.1	0.2	0.2
	Lichen	25.0	25.0	0.1	0.2	0.2

***Eriodictyon californicum* / Herbaceous Association**

Common Name: California Yerba Santa Shrubland

Alliance: *Lotus scoparius* – *Lupinus albifrons* – *Eriodictyon* spp. Shrubland Alliance

Local Vegetation Description

The California Yerba Santa Association forms an intermittent to continuous shrub layer. The emergent tree layer is typically absent, and the herbaceous layer is sparse to open. Dominant and characteristic shrubs include *Eriodictyon californicum*, *Baccharis pilularis*, and *Toxicodendron diversilobum*, and those that are often present include *Ceanothus thyrsiflorus*, *Diplacus aurantiacus*, *Frangula californica*, and *Rubus ursinus*. Commonly associated emergent trees at sparse cover include *Arbutus menziesii*, *Pseudotsuga menziesii*, *Quercus agrifolia*, and *Umbellularia californica*. The herbs that are often present include *Heracleum maximum*, *Iris douglasiana*, *Marah fabaceus*, *Pseudognaphalium* spp., *Pteridium aquilinum*, *Scrophularia californica*, and *Stachys bullata*, and herbs that are sometimes present include *Artemisia douglasiana*, *Briza maxima*, *Carex* spp., *Clinopodium douglasii*, *Dryopteris arguta*, *Elymus glaucus*, *Hypericum concinnum*, *Hypochaeris radicata*, *Juncus* spp., *Luzula comosa*, *Phacelia californica*, *Rumex acetosella*, *Sanicula crassicaulis*, *Sonchus asper*, and *Whipplea modesta*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.1	0 – 0.2	3.5	2 – 5
Regenerating or Shrubby Tree	0.0	0 – 0	0.3	0 – 0.5
Shrub	66.7	45.0 – 80.0	0.8	0 – 2
Herb	10.3	1 – 20	0.4	0 – 1

Local Environmental Description

Elevation: Mean 327 m, Range 218 – 487 m

Aspect: NW (2), NE (1)

Slope: Mean 10 degrees, Range 6 – 16 degrees

Macro Topography: Ridge top (3)

Large Rock: Mean 0.1%, Range 0.0 – 0.2%

Small Rock: Mean 17.4%, Range 0.2 – 50.0%

Fines Cover: Mean 14.3%, Range 5.0 – 25.0%

Litter Cover: Mean 65.0%, Range 20.0 – 92%

Soil Texture (field assessed): Moderately coarse, sandy loam (2), Medium to very fine, loamy sand (1)

Geology (field or map data): Granitic (generic) (1), Sandstone (1), Franciscan melange (1)

Eriodictyon californicum / Herbaceous Association
Lotus scoparius – *Lupinus albifrons* – *Eriodictyon* spp. Shrubland Alliance

San Mateo County Watersheds: Pacifica (1), San Mateo Bayside (1)
Other Watersheds, Marin Co.: San Rafael (1)

Site Impacts

This association has very low non-native plant cover (average 0.4%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Briza maxima*, *Hypochaeris radicata*, *Rumex acetosella*, and *Sonchus asper*.

Classification Comments

Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Buck-Diaz and Evens 2011a, Buck-Diaz et al. 2012, Evens et al. 2004, Klein et al. 2007, Klein et al. 2015

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** N

Surveys Used for Description

Total: N=3; San Mateo County (n=2): SMAT0064, SMAT0156

Marin County (n=1): MOSD0026

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Arbutus menziesii</i>	33.3	16.7	0.1	0.2	0.2				
	<i>Pseudotsuga menziesii</i>	33.3	16.7	0.1	0.2	0.2				
	<i>Quercus agrifolia</i>	33.3	16.7	0.1	0.2	0.2				
	<i>Umbellularia californica</i>	33.3	16.7	0.1	0.2	0.2				
Shrub	<i>Eriodictyon californicum</i>	100.0	48.8	38.3	10	60			Y	Y
	<i>Baccharis pilularis</i>	100.0	17.7	15.1	0.2	25				Y
	<i>Toxicodendron diversilobum</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Frangula californica</i>	66.7	3.1	2.7	3	5				Y
	<i>Ceanothus thyrsiflorus</i>	66.7	2.1	1.7	0.2	5				Y
	<i>Rubus ursinus</i>	66.7	1.2	1.0	1	2				Y
	<i>Diplacus aurantiacus</i>	66.7	1.0	0.7	0.2	2				Y
	<i>Pickeringia montana</i>	33.3	24.5	10.0	30	30				
	<i>Rubus parviflorus</i>	33.3	0.4	0.3	1	1				
	<i>Ribes malvaceum</i>	33.3	0.4	0.3	1	1				
	<i>Arctostaphylos spp.</i>	33.3	0.2	0.1	0.2	0.2				
	<i>Sambucus spp.</i>	33.3	0.1	0.1	0.2	0.2				

Eriodictyon californicum / Herbaceous Association
Lotus scoparius – *Lupinus albifrons* – *Eriodictyon* spp. Shrubland Alliance

	<i>Lepechinia calycina</i>	33.3	0.1	0.1	0.2	0.2	
	<i>Ribes spp.</i>	33.3	0.1	0.1	0.2	0.2	
	<i>Vaccinium ovatum</i>	33.3	0.1	0.1	0.2	0.2	
	<i>Lotus scoparius</i>	33.3	0.1	0.1	0.2	0.2	
Herb							
	<i>Pteridium aquilinum</i>	66.7	33.2	1.7	2	3	Y
	<i>Stachys bullata</i>	66.7	17.1	0.7	1	1	Y
	<i>Scrophularia californica</i>	66.7	7.6	0.4	0.2	1	Y
	<i>Heracleum maximum</i>	66.7	3.4	0.1	0.2	0.2	Y
	<i>Marah fabaceus</i>	66.7	3.4	0.1	0.2	0.2	Y
	<i>Pseudognaphalium spp.</i>	66.7	3.4	0.1	0.2	0.2	Y
	<i>Iris douglasiana</i>	66.7	2.8	0.1	0.2	0.2	Y
	<i>unknown Poaceae</i>	33.3	2.4	0.1	0.2	0.2	
	<i>Sonchus asper</i>	33.3	2.4	0.1	0.2	0.2	
	<i>Sanicula crassicaulis</i>	33.3	2.4	0.1	0.2	0.2	
	<i>Artemisia douglasiana</i>	33.3	2.4	0.1	0.2	0.2	
	<i>Dryopteris arguta</i>	33.3	2.4	0.1	0.2	0.2	
	<i>Hypochaeris radicata</i>	33.3	1.8	0.1	0.2	0.2	
	<i>Luzula comosa</i>	33.3	1.8	0.1	0.2	0.2	
	<i>Juncus spp.</i>	33.3	1.8	0.1	0.2	0.2	
	<i>Hypericum concinnum</i>	33.3	1.8	0.1	0.2	0.2	
	<i>Briza maxima</i>	33.3	1.8	0.1	0.2	0.2	
	<i>Carex spp.</i>	33.3	1.8	0.1	0.2	0.2	
	<i>Whipplea modesta</i>	33.3	1.8	0.1	0.2	0.2	
	<i>Elymus glaucus</i>	33.3	1.8	0.1	0.2	0.2	
	<i>Clinopodium douglasii</i>	33.3	1.0	0.1	0.2	0.2	
	<i>Phacelia californica</i>	33.3	1.0	0.1	0.2	0.2	
	<i>Rumex acetosella</i>	33.3	1.0	0.1	0.2	0.2	

***Lotus scoparius* Association**

Common Name: Deer Weed Shrubland

Alliance: *Lotus scoparius* – *Lupinus albifrons* – *Eriodictyon* spp. Shrubland Alliance

Local Vegetation Description

The Deer Weed Association forms an open to intermittent shrub layer. The emergent tree layer is typically absent, and the herbaceous layer is open. Dominant and characteristic shrubs include *Lotus scoparius*, and those that are often present include *Adenostoma fasciculatum*, *Arctostaphylos crustacea*, *Baccharis pilularis*, *Diplacus aurantiacus*, *Rubus ursinus*, and *Salix lasiolepis*. Regenerating or shrubby trees that are often present include *Quercus parvula* var. *shrevei*. The herbaceous layer typically includes *Avena* spp., *Bromus diandrus*, *Silene gallica*, and *Vulpia myuros*, and herbs that are often present include *Anagallis arvensis*, *Brassica nigra*, *Camissonia* spp., *Centaurea melitensis*, *Chorizanthe cuspidata*, *Conyza canadensis*, *Cortaderia jubata*, *Cynosurus echinatus*, *Erodium* spp., *Eschscholzia californica*, *Eurybia radulina*, *Gastridium phleoides*, *Hypochaeris glabra*, *Lessingia germanorum*, *Logfia gallica*, *Lolium perenne*, *Madia gracilis*, *Nassella lepida*, *Navarretia squarrosa*, *Polygonum aviculare*, *Pseudognaphalium californicum*, *Rumex acetosella*, *Spergularia rubra*, *Stephanomeria*, and *Vulpia bromoides*. Commonly associated non-vascular plants include Lichen and Moss.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.1	0 – 0.2	1.5	1 – 2
Shrub	31.6	8.2 – 55.0	1.5	1 – 2
Herb	10.0	5 – 15	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 356 m, Range 114 – 598 m

Aspect: SW(1)

Slope: Mean 29 degrees, Range 12 – 45 degrees

Macro Topography: Upper 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 5.0%

Fines Cover: Mean 27.5%, Range 10 – 45%%

Litter Cover: Mean 57.0%, Range 31 – 83%

Soil Texture (field assessed): Moderately coarse, sandy loam (1)

Geology (field or map data): Sandstone, shale, and conglomerate (1), Sedimentary (type unknown) (1)

San Mateo County Watersheds: Pescadero Creek (1), San Mateo Bayside (1)

Site Impacts

This association has low non-native plant cover (average 14.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Avena* spp., *Bromus diandrus*, *Rumex acetosella*, *Silene gallica*, *Vulpia bromoides*, and *Vulpia myuros*.

Classification Comments

None.

References: AECOM 2013, Buck-Diaz and Evens 2011a, Buck-Diaz et al. 2012, Evens and San 2005, Evens et al. 2006, Keeler-Wolf and Evens 2006, Kittel et al. 2012, Sproul et al. 2011

Global Rarity Rank: G5

State Rarity Rank: S5

State Rare: N

Surveys Used for Description

Total: N=2; San Mateo County (n=2): SMAT0259, YERBA06

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Regenerating or Shrubby Trees	<i>Quercus parvula</i> var. <i>shrevei</i>	50.0	50.0	0.1	0.2	0.2				Y
Shrub										

	<i>Lotus scoparius</i>	100.0	95.2	29.0	8	50	Y	Y
	<i>Arctostaphylos crustacea</i>	50.0	2.8	1.5	3	3		Y
	<i>Salix lasiolepis</i>	50.0	1.2	0.1	0.2	0.2		Y
	<i>Rubus ursinus</i>	50.0	0.2	0.1	0.2	0.2		Y
	<i>Diplacus aurantiacus</i>	50.0	0.2	0.1	0.2	0.2		Y
	<i>Adenostoma fasciculatum</i>	50.0	0.2	0.1	0.2	0.2		Y
	<i>Baccharis pilularis</i>	50.0	0.2	0.1	0.2	0.2		Y
Herb								
	<i>Vulpia myuros</i>	100.0	9.5	0.6	0.2	1		Y
	<i>Avena spp.</i>	100.0	4.8	0.6	0.2	1		Y
	<i>Silene gallica</i>	100.0	2.4	0.2	0.2	0.2		Y
	<i>Bromus diandrus</i>	100.0	2.4	0.2	0.2	0.2		Y
	<i>Lessingia germanorum</i>	50.0	23.8	4.0	8	8		Y
	<i>Chorizanthe cuspidata</i>	50.0	8.9	1.5	3	3		Y
	<i>Rumex acetosella</i>	50.0	8.9	1.5	3	3		Y
	<i>Vulpia bromoides</i>	50.0	8.9	0.5	1	1		Y
	<i>Stephanomeria spp.</i>	50.0	1.8	0.1	0.2	0.2		Y
	<i>Hypochaeris glabra</i>	50.0	1.8	0.1	0.2	0.2		Y
	<i>Spergularia rubra</i>	50.0	1.8	0.1	0.2	0.2		Y
	<i>Pseudognaphalium californicum</i>	50.0	1.8	0.1	0.2	0.2		Y
	<i>Polygonum aviculare</i>	50.0	1.8	0.1	0.2	0.2		Y
	<i>Navarretia squarrosa</i>	50.0	1.8	0.1	0.2	0.2		Y
	<i>Nassella lepida</i>	50.0	1.8	0.1	0.2	0.2		Y
	<i>Eurybia radulina</i>	50.0	1.8	0.1	0.2	0.2		Y
	<i>Lolium perenne</i>	50.0	1.8	0.1	0.2	0.2		Y
	<i>Logfia gallica</i>	50.0	1.8	0.1	0.2	0.2		Y
	<i>Cynosurus echinatus</i>	50.0	1.8	0.1	0.2	0.2		Y
	<i>Anagallis arvensis</i>	50.0	1.8	0.1	0.2	0.2		Y
	<i>Centaurea melitensis</i>	50.0	1.8	0.1	0.2	0.2		Y
	<i>Gastridium phleoides</i>	50.0	1.8	0.1	0.2	0.2		Y
	<i>Madia gracilis</i>	50.0	1.8	0.1	0.2	0.2		Y
	<i>Brassica nigra</i>	50.0	0.6	0.1	0.2	0.2		Y
	<i>Erodium spp.</i>	50.0	0.6	0.1	0.2	0.2		Y
	<i>Cortaderia jubata</i>	50.0	0.6	0.1	0.2	0.2		Y
	<i>Conyza canadensis</i>	50.0	0.6	0.1	0.2	0.2		Y
	<i>Eschscholzia californica</i>	50.0	0.6	0.1	0.2	0.2		Y
	<i>Camissonia spp.</i>	50.0	0.6	0.1	0.2	0.2		Y
Non-Vascular								
	Lichen	50.0	50.0	0.1	0.2	0.2		Y
	Moss	50.0	50.0	0.1	0.2	0.2		Y

***Lupinus arboreus* Shrubland Alliance**



Common Name: Yellow bush lupine scrub

NVC Alliance Code: A4120. *Lupinus arboreus* Dune Scrub Alliance

Statewide Description

Lupinus arboreus is dominant or co-dominant in the shrub canopy with *Ammophila arenaria*, *Baccharis pilularis*, *Ericameria ericoides*, and *Lupinus chamissonis*. Emergent trees or tall shrubs may be present at low cover, including *Alnus rubra* or *Morella californica*.

Stands of *Lupinus arboreus* occur natively in central and southern California from Sonoma to Ventura counties. They have become widely naturalized in northern California along the coast from Mendocino and Humboldt Counties to Vancouver, Canada. However, demarcation between native and naturalized populations is still disputed (Pickart 2000). Native stands often occupy stabilized dunes, coastal bluffs, and disturbed areas (e.g., pastures) near the coast, and they appear to have a short temporal nature (Keeler-Wolf et al. 2003a, Ross 2002b). Dune scrub, which includes stands of the native *Lupinus arboreus*, is characteristic of backdunes along the coast, south of Bodega Head in Sonoma County. Dune mat, a collection of annuals and perennials of the *Abronia latifolia* – *Ambrosia chamissonis* Alliance, exists on the northern California coast (Pickart and Barbour 2007) where it covers nearshore dune ridges. Dune mat is now rare. *Lupinus arboreus* aggressively invades dune mat and modifies environmental conditions to facilitate the invasion of non-native annual

grasses, other weeds, and long-lived natives that replaces the dune mat (Pickart 2000, Pickart and Sawyer 1998, Ross2002b).

Local Vegetation Description

The Yellow bush lupine scrub Alliance forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse, and the herbaceous layer is open to intermittent. Dominant and characteristic shrubs include *Lupinus arboreus* and *Baccharis pilularis*, and those that are often present include *Rubus ursinus*. Commonly associated emergent trees at sparse cover include *Hesperocyparis macrocarpa*. Herbs that are often present include *Bromus diandrus*, *Eriophyllum stoechadifolium*, *Sonchus asper*, and *Vulpia bromoides*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.5	0 – 2	3.5	2 – 5
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.2	0.0 – 1.2	0.8	0.5 – 1
Shrub	50.0	35.0 – 80.0	1.1	0.5 – 2
Herb	26.8	5 – 42	0.4	0 – 1

Local Membership Rule

Lupinus arboreus dominates or co-dominates with *Baccharis pilularis* and/or *Rubus ursinus*, often with high cover of grasses including *Bromus diandrus*, *Holcus lanatus*, *Lolium perenne*, *Vulpia bromoides*, and other non-native herbaceous species.

Local Environmental Description

Elevation: Mean 118 m, Range 13 – 484 m

Aspect: SW (1), SE (1), NW (1), Flat (1), Variable (1)

Slope: Mean 17 degrees, Range 0 – 41 degrees

Macro Topography: Middle 1/3 of slope (2), Bottom to Lower 1/3 of slope (1), Bottom (1), Upper 1/3 of slope to Ridgetop (1)

Large Rock: Mean 0.0%, Range 0.0 – 0.2%

Small Rock: Mean 1.3%, Range 0.0 – 5.2%

Fines Cover: Mean 29.5%, Range 15.0 – 60.0%

Litter Cover: Mean 52.8%, Range 0.0 – 82%

Soil Texture (field assessed): Medium silt (1), Moderately fine sandy clay loam (1), Sand, (class unknown) (1), Medium sand (1)

Geology (field or map data): Sand dunes (2), Granitic (generic) (1), Mixed sedimentary (1)

San Mateo County Watersheds: Ano Nuevo (1), Pacifica (1), San Francisco Bayside (1), San Francisco Coastal (1), Tunitas Creek (1)

Other Watersheds, San Francisco Co.: San Francisco Bayside (1)

Site Impacts

This alliance has moderate non-native plant cover (average 26.3%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Albizia lophantha*, *Ammophila arenaria*, *Anagallis arvensis*, *Brassica rapa*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Carpobrotus edulis*, *Cirsium vulgare*, *Cortaderia jubata*, *Crassula multicava*, *Delairea odorata*, *Hirschfeldia incana*, *Hypochaeris radicata*, *Lactuca virosa*, *Lobularia maritima*, *Picris echioides*, *Polypogon monspeliensis*, *Pseudognaphalium luteoalbum*, *Raphanus sativus*, *Rumex acetosella*, *Sonchus asper*, *Sonchus oleraceus*, and *Vulpia bromoides*.

Associations in San Mateo County

- *Baccharis pilularis* – *Lupinus arboreus**
- *Lupinus arboreus*

Classification Comments

Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Buck-Diaz et al. 2020, Duebendorfer 1989, Holton and Johnson 1979, Klein et al. 2015, LaBanca 1993

Global Rarity Rank: G4

State Rarity Rank: S4

Surveys Used for Description

Total: N=5; San Mateo County (n=4): SMAT0119, SMAT0155, SMAT0216, SMAT0323

San Francisco County (n=1): GGNRA392

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Hesperocyparis macrocarpa</i>	20.0	20.0	0.2	1	1				
	<i>Pinus radiata</i>	20.0	16.7	0.2	1	1				
Regenerating or Shrubby Trees	<i>Hesperocyparis macrocarpa</i>	20.0	3.3	0.0	0.2	0.2				
	<i>Lupinus arboreus</i>	100.0	59.8	28.4	7	60	Y	Y		Y
Shrub	<i>Baccharis pilularis</i>	100.0	18.9	9.0	2	21	Y			Y
	<i>Rubus ursinus</i>	60.0	8.5	3.2	0.2	15				Y

Lupinus arboreus Shrubland Alliance

	<i>Toxicodendron diversilobum</i>	40.0	4.1	2.0	1	9	
	<i>Lotus scoparius</i>	40.0	1.3	0.6	0.2	3	
	<i>Frangula californica</i>	20.0	2.3	2.0	10	10	
	<i>Lupinus chamissonis</i>	20.0	2.6	1.2	6	6	
	<i>Rubus parviflorus</i>	20.0	0.5	0.4	2	2	
	<i>Diplacus aurantiacus</i>	20.0	0.5	0.4	2	2	
	<i>Ceanothus thyrsiflorus</i>	20.0	0.2	0.2	1	1	
	<i>Albizia lophantha</i>	20.0	0.5	0.2	1	1	
	<i>Symphoricarpos albus</i>	20.0	0.2	0.2	1	1	
	<i>Morella californica</i>	20.0	0.5	0.2	1	1	
	<i>Vaccinium ovatum</i>	20.0	0.0	0.0	0.2	0.2	
Herb							
	<i>Vulpia bromoides</i>	60.0	12.6	4.8	2	15	Y
	<i>Bromus diandrus</i>	60.0	7.8	4.2	2	16	Y
	<i>Eriophyllum stoechadifolium</i>	60.0	5.9	2.2	1	5	Y
	<i>Sonchus asper</i>	60.0	0.6	0.1	0.2	0.2	Y
	<i>Carpobrotus edulis</i>	40.0	17.4	10.2	1	50	
	<i>Pteridium aquilinum</i>	40.0	12.3	3.2	4	12	
	<i>Scrophularia californica</i>	40.0	7.7	1.2	3	3	
	<i>Achillea millefolium</i>	40.0	1.1	0.6	0.2	3	
	<i>Dudleya farinosa</i>	40.0	0.7	0.4	0.2	2	
	<i>Chlorogalum pomeridianum</i>	40.0	0.4	0.2	0.2	1	
	<i>Rumex acetosella</i>	40.0	0.5	0.1	0.2	0.2	
	<i>Avena spp.</i>	40.0	0.5	0.1	0.2	0.2	
	<i>Symphyotrichum chilense</i>	20.0	7.0	3.0	15	15	
	<i>Delairea odorata</i>	20.0	4.7	2.0	10	10	
	<i>Polypodium californicum</i>	20.0	2.0	1.2	6	6	
	<i>Conyza canadensis</i>	20.0	3.2	1.0	5	5	
	<i>Elymus triticoides</i>	20.0	1.3	0.8	4	4	
	<i>Eriogonum latifolium</i>	20.0	1.0	0.6	3	3	
	<i>Crassula multicava</i>	20.0	1.4	0.6	3	3	
	<i>Claytonia perfoliata</i>	20.0	1.0	0.6	3	3	
	<i>Lotus wrangelianus</i>	20.0	0.9	0.4	2	2	
	<i>Melica imperfecta</i>	20.0	0.7	0.4	2	2	
	<i>Melilotus spp.</i>	20.0	0.7	0.4	2	2	
	<i>Eschscholzia californica</i>	20.0	0.3	0.2	1	1	
	<i>Clinopodium douglasii</i>	20.0	2.1	0.2	1	1	
	<i>Juncus arcticus</i>	20.0	0.6	0.2	1	1	
	<i>Angelica hendersonii</i>	20.0	0.5	0.2	1	1	
	<i>Marah fabaceus</i>	20.0	0.3	0.2	1	1	
	<i>Cortaderia jubata</i>	20.0	0.5	0.2	1	1	
	<i>Madia sativa</i>	20.0	0.1	0.0	0.2	0.2	

<i>Picris echioides</i>	20.0	0.1	0.0	0.2	0.2
<i>Pseudognaphalium luteoalbum</i>	20.0	0.1	0.0	0.2	0.2
<i>Pterostegia drymarioides</i>	20.0	0.1	0.0	0.2	0.2
<i>Sonchus oleraceus</i>	20.0	0.1	0.0	0.2	0.2
<i>Pseudognaphalium ramosissimum</i>	20.0	0.1	0.0	0.2	0.2
<i>Pseudognaphalium stramineum</i>	20.0	0.1	0.0	0.2	0.2
<i>Solanum americanum</i>	20.0	0.1	0.0	0.2	0.2
<i>Raphanus sativus</i>	20.0	0.1	0.0	0.2	0.2
<i>Polypogon monspeliensis</i>	20.0	0.1	0.0	0.2	0.2
<i>Anagallis arvensis</i>	20.0	0.1	0.0	0.2	0.2
<i>Lobularia maritima</i>	20.0	0.1	0.0	0.2	0.2
<i>Ammophila arenaria</i>	20.0	0.1	0.0	0.2	0.2
<i>Artemisia douglasiana</i>	20.0	0.4	0.0	0.2	0.2
<i>Artemisia pycnocephala</i>	20.0	0.1	0.0	0.2	0.2
<i>Bromus hordeaceus</i>	20.0	0.4	0.0	0.2	0.2
<i>Brassica rapa</i>	20.0	0.1	0.0	0.2	0.2
<i>Carduus pycnocephalus</i>	20.0	0.4	0.0	0.2	0.2
<i>Cirsium vulgare</i>	20.0	0.1	0.0	0.2	0.2
<i>Rumex salicifolius</i>	20.0	0.1	0.0	0.2	0.2
<i>Daucus pusillus</i>	20.0	0.1	0.0	0.2	0.2
<i>Elymus spp.</i>	20.0	0.4	0.0	0.2	0.2
<i>Equisetum spp.</i>	20.0	0.1	0.0	0.2	0.2
<i>Gamochaeta ustulata</i>	20.0	0.1	0.0	0.2	0.2
<i>Heracleum maximum</i>	20.0	0.4	0.0	0.2	0.2
<i>Hirschfeldia incana</i>	20.0	0.1	0.0	0.2	0.2
<i>Hypochaeris radicata</i>	20.0	0.1	0.0	0.2	0.2
<i>Juncus patens</i>	20.0	0.1	0.0	0.2	0.2
<i>Lactuca virosa</i>	20.0	0.1	0.0	0.2	0.2
<i>Cryptantha leiocarpa</i>	20.0	0.1	0.0	0.2	0.2
Non-Vascular					
Moss	20.0	20.0	0.0	0.2	0.2

***Baccharis pilularis* – *Lupinus arboreus* Association**

Common Name: Coyote Brush – Yellow Bush Lupine Shrubland

Alliance: *Lupinus arboreus* Shrubland Alliance

Local Vegetation Description

The Coyote Brush – Yellow Bush Lupine Association forms an intermittent shrub layer in the single sample available. The emergent tree layer is absent, and the herbaceous layer is intermittent. Dominant and characteristic shrubs include *Baccharis pilularis* and *Lupinus arboreus*, and those that are often present include *Lotus scoparius*, *Lupinus chamissonis*, and *Toxicodendron diversilobum*. The herbs that are sometimes present include *Achillea millefolium*, *Bromus diandrus*, *Chlorogalum pomeridianum*, *Claytonia perfoliata*, *Dudleya farinosa*, *Elymus triticoides*, *Eriogonum latifolium*, *Eschscholzia californica*, *Marah fabaceus*, *Melica imperfecta*, *Polypodium californicum*, *Pteridium aquilinum*, and *Vulpia bromoides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	NA	no data	no data
Hardwood	0.0	NA	no data	no data
Regenerating or Shrubby Tree	0.0	NA	no data	no data
Shrub	46.0	NA	no data	no data
Herb	60.0	NA	no data	no data

Local Environmental Description

Elevation: 49 m

Aspect: SW (1)

Slope: 21 degrees

Macro Topography: Middle 1/3 of slope (1)

Large Rock: no data

Small Rock: no data

Fines Cover: no data

Litter Cover: no data

Soil Texture (field assessed): no data

Geology (field or map data): no data

San Mateo County Watersheds: none

Other Watersheds, San Francisco Co.: San Francisco Bayside (1)

Site Impacts

This association has moderate non-native plant cover (average 21.6%) relative to native cover. Non- native species that occur with highest frequency and abundance include *Bromus diandrus* and *Vulpia bromoides*.

Classification Comments

This association was originally placed in the *Baccharis pilularis* Alliance.

References: Belsher 1999, Keeler-Wolf et al. 2003a, Parker 1974

Global Rarity Rank: G3 **State Rarity Rank:** S3? **State Rare:** N

Surveys Used for Description

Total: N=1; San Mateo County (n=0)

San Francisco County (n=1): GGNRA392

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	100.0	45.7	21.0	21	21			Y	Y
	<i>Toxicodendron diversilobum</i>	100.0	19.6	9.0	9	9				Y
	<i>Lupinus arboreus</i>	100.0	15.2	7.0	7	7				Y
	<i>Lupinus chamissonis</i>	100.0	13.0	6.0	6	6				Y
	<i>Lotus scoparius</i>	100.0	6.5	3.0	3	3				Y
	Herb	<i>Bromus diandrus</i>	100.0	26.1	16.0	16	16			
<i>Pteridium aquilinum</i>		100.0	19.6	12.0	12	12				Y
<i>Vulpia bromoides</i>		100.0	11.4	7.0	7	7				Y
<i>Polypodium californicum</i>		100.0	9.8	6.0	6	6				Y
<i>Elymus triticoides</i>		100.0	6.5	4.0	4	4				Y
<i>Claytonia perfoliata</i>		100.0	4.9	3.0	3	3				Y
<i>Achillea millefolium</i>		100.0	4.9	3.0	3	3				Y
<i>Eriogonum latifolium</i>		100.0	4.9	3.0	3	3				Y
<i>Dudleya farinosa</i>		100.0	3.3	2.0	2	2				Y
<i>Melica imperfecta</i>		100.0	3.3	2.0	2	2				Y
<i>Eschscholzia californica</i>		100.0	1.6	1.0	1	1				Y
<i>Marah fabaceus</i>		100.0	1.6	1.0	1	1				Y
<i>Chlorogalum pomeridianum</i>		100.0	1.6	1.0	1	1				Y
<i>Rumex acetosella</i>		100.0	0.3	0.2	0.2	0.2				Y
<i>Bromus diandrus</i>		100.0	26.1	16.0	16	16				Y

***Lupinus arboreus* Association**

Common Name: Yellow Bush Lupine Shrubland

Alliance: *Lupinus arboreus* Shrubland Alliance

Local Vegetation Description

The Yellow Bush Lupine Association forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse, and the herbaceous layer is open to intermittent. Dominant and characteristic shrubs include *Lupinus arboreus*, and those that are often present include *Baccharis pilularis*. The herbs that are often present include *Achillea millefolium* and *Lolium perenne*, and herbs that are sometimes present include *Bromus diandrus*, *Carpobrotus edulis*, *Eriophyllum stoechadifolium*, *Holcus lanatus*, *Plantago lanceolata*, *Pteridium aquilinum*, and *Rumex acetosella*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.5	0 – 2	3.5	2 – 5
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.3	0 – 1.2	0.8	0.5 – 1
Shrub	50.0	35.0 – 80.0	1.1	0.5 – 2
Herb	26.8	5 – 42	0.4	0 – 1

Local Environmental Description

Elevation: Mean 136 m, Range 13 – 484 m

Aspect: Flat (1), NW (1), SE (1), Variable (1)

Slope: Mean 16 degrees, Range 0 – 41 degrees

Macro Topography: Upper 1/3 of slope to Ridgetop (1), Bottom (1), Bottom to Lower 1/3 of slope (1), Middle 1/3 of slope (1)

Large Rock: Mean 0.1%, Range 0.0 – 0.2%

Small Rock: Mean 1.6%, Range 0.0 – 5.2%

Fines Cover: Mean 29.5%, Range 15.0 – 60.0%

Litter Cover: Mean 66.0%, Range 35.0 – 82%

Soil Texture (field assessed): Medium sand (1), Sand, (class unknown) (1), Moderately fine sandy clay loam (1), Medium silt (1)

Geology (field or map data): Sand dunes (2), Granitic (generic) (1), Mixed sedimentary (1)

San Mateo County Watersheds: Ano Nuevo (1), Pacifica (1), San Francisco Coastal (1), Tunitas Creek (1)

Site Impacts

This association has moderate non-native plant cover (average 27.5%) relative to native

cover. Non- native species that occur with highest frequency and abundance include *Bromus diandrus*, *Carpobrotus edulis*, *Holcus lanatus*, *Lolium perenne*, *Plantago lanceolata*, and *Rumex acetosella*.

Classification Comments

None.

References: Holton and Johnson 1979, Klein et al. 2015, LaBanca 1993

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** N

Surveys Used for Description

Total: N=4; San Mateo County (n=4): SMAT0119, SMAT0155, SMAT0216, SMAT0323

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree										
	<i>Hesperocyparis macrocarpa</i>	25.0	25.0	0.3	1	1				
Regenerating or Shrubby Trees										
	<i>Pinus radiata</i>	25.0	20.8	0.3	1	1				
	<i>Hesperocyparis macrocarpa</i>	25.0	4.2	0.1	0.2	0.2				
Shrub										
	<i>Lupinus arboreus</i>	100.0	71.0	33.8	20	60		Y		Y
	<i>Baccharis pilularis</i>	100.0	12.2	6.0	2	10				Y
	<i>Rubus ursinus</i>	75.0	10.6	4.1	0.2	15				Y
	<i>Frangula californica</i>	25.0	2.8	2.5	10	10				
	<i>Albizia lophantha</i>	25.0	0.6	0.3	1	1				
	<i>Morella californica</i>	25.0	0.6	0.3	1	1				
	<i>Diplacus aurantiacus</i>	25.0	0.6	0.5	2	2				
	<i>Rubus parviflorus</i>	25.0	0.6	0.5	2	2				
	<i>Ceanothus thyrsiflorus</i>	25.0	0.3	0.3	1	1				
	<i>Symphoricarpos albus</i>	25.0	0.3	0.3	1	1				
	<i>Toxicodendron diversilobum</i>	25.0	0.3	0.3	1	1				
	<i>Vaccinium ovatum</i>	25.0	0.1	0.1	0.2	0.2				

Lupinus arboreus Association
Lupinus arboreus Shrubland Alliance

Herb							
	<i>Lotus scoparius</i>	25.0	0.1	0.1	0.2	0.2	
	<i>Eriophyllum stoechadifolium</i>	75.0	7.3	2.8	1	5	Y
	<i>Sonchus asper</i>	75.0	0.7	0.2	0.2	0.2	Y
	<i>Carpobrotus edulis</i>	50.0	21.7	12.8	1	50	Y
	<i>Vulpia bromoides</i>	50.0	12.9	4.3	2	15	Y
	<i>Scrophularia californica</i>	50.0	9.6	1.5	3	3	Y
	<i>Bromus diandrus</i>	50.0	3.2	1.3	2	3	Y
	<i>Avena spp.</i>	50.0	0.6	0.1	0.2	0.2	Y
	<i>Pteridium aquilinum</i>	25.0	10.4	1.0	4	4	
	<i>Symphyotrichum chilense</i>	25.0	8.8	3.8	15	15	
	<i>Delairea odorata</i>	25.0	5.8	2.5	10	10	
	<i>Conyza canadensis</i>	25.0	4.0	1.3	5	5	
	<i>Clinopodium douglasii</i>	25.0	2.6	0.3	1	1	
	<i>Crassula multicava</i>	25.0	1.8	0.8	3	3	
	<i>Lotus wrangelianus</i>	25.0	1.2	0.5	2	2	
	<i>Melilotus spp.</i>	25.0	0.8	0.5	2	2	
	<i>Juncus arcticus</i>	25.0	0.8	0.3	1	1	
	<i>Cortaderia jubata</i>	25.0	0.6	0.3	1	1	
	<i>Angelica hendersonii</i>	25.0	0.6	0.3	1	1	
	<i>Bromus hordeaceus</i>	25.0	0.5	0.1	0.2	0.2	
	<i>Heracleum maximum</i>	25.0	0.5	0.1	0.2	0.2	
	<i>Rumex acetosella</i>	25.0	0.5	0.1	0.2	0.2	
	<i>Elymus spp.</i>	25.0	0.5	0.1	0.2	0.2	
	<i>Carduus pycnocephalus</i>	25.0	0.5	0.1	0.2	0.2	
	<i>Artemisia douglasiana</i>	25.0	0.5	0.1	0.2	0.2	
	<i>Hypochaeris radicata</i>	25.0	0.2	0.1	0.2	0.2	
	<i>Juncus patens</i>	25.0	0.2	0.1	0.2	0.2	
	<i>Lactuca virosa</i>	25.0	0.2	0.1	0.2	0.2	
	<i>Cryptantha leiocarpa</i>	25.0	0.2	0.1	0.2	0.2	
	<i>Pseudognaphalium ramosissimum</i>	25.0	0.2	0.1	0.2	0.2	
	<i>Pseudognaphalium stramineum</i>	25.0	0.2	0.1	0.2	0.2	
	<i>Cirsium vulgare</i>	25.0	0.2	0.1	0.2	0.2	
	<i>Solanum americanum</i>	25.0	0.2	0.1	0.2	0.2	
	<i>Artemisia pycnocephala</i>	25.0	0.2	0.1	0.2	0.2	
	<i>Pterostegia drymarioides</i>	25.0	0.2	0.1	0.2	0.2	
	<i>Ammophila arenaria</i>	25.0	0.2	0.1	0.2	0.2	
	<i>Brassica rapa</i>	25.0	0.1	0.1	0.2	0.2	
	<i>Picris echioides</i>	25.0	0.1	0.1	0.2	0.2	
	<i>Gamochaeta ustulata</i>	25.0	0.1	0.1	0.2	0.2	
	<i>Rumex salicifolius</i>	25.0	0.1	0.1	0.2	0.2	
	<i>Dudleya farinosa</i>	25.0	0.1	0.1	0.2	0.2	

Lupinus arboreus Association
Lupinus arboreus Shrubland Alliance

<i>Achillea millefolium</i>	25.0	0.1	0.1	0.2	0.2
<i>Hirschfeldia incana</i>	25.0	0.1	0.1	0.2	0.2
<i>Chlorogalum pomeridianum</i>	25.0	0.1	0.1	0.2	0.2
<i>Pseudognaphalium luteoalbum</i>	25.0	0.1	0.1	0.2	0.2
<i>Polypogon monspeliensis</i>	25.0	0.1	0.1	0.2	0.2
<i>Sonchus oleraceus</i>	25.0	0.1	0.1	0.2	0.2
<i>Madia sativa</i>	25.0	0.1	0.1	0.2	0.2
<i>Equisetum spp.</i>	25.0	0.1	0.1	0.2	0.2
<i>Anagallis arvensis</i>	25.0	0.1	0.1	0.2	0.2
<i>Daucus pusillus</i>	25.0	0.1	0.1	0.2	0.2
<i>Lobularia maritima</i>	25.0	0.1	0.1	0.2	0.2
<i>Raphanus sativus</i>	25.0	0.1	0.1	0.2	0.2
Non-Vascular					
Moss	25.0	25.0	0.1	0.2	0.2

***Lupinus chamissonis* – *Ericameria ericoides* Shrubland Alliance**



Common Name: Silver dune lupine – mock heather scrub

NVC Alliance Code: A0822. *Isocoma menziesii* - *Lupinus chamissonis* - *Ericameria ericoides* Shrubland Alliance

Statewide Description

Ericameria ericoides and *Lupinus chamissonis* occur together or alone in the shrub canopy with *Artemisia californica*, *Artemisia pycnocephala*, *Ephedra californica*, *Isocoma menziesii*, *Lupinus arboreus*, *Opuntia littoralis*, *Rhus integrifolia*, and *Toxicodendron diversilobum*.

This alliance occurs as isolated patches along the California coastline. It shares species with the *Abronia latifolia* – *Ambrosia chamissonis* Alliance and other coastal bluff scrub alliances. Stands tend to occupy settings on stabilized dunes and near-shore uplifted terraces that are more exposed than other coastal shrubby alliances such as *Lupinus arboreus* or *Baccharis pilularis*.

Local Vegetation Description

The Silver dune lupine – mock heather scrub Alliance forms an intermittent shrub layer. The emergent tree layer is typically absent, and the herbaceous layer is open to intermittent. Dominant and characteristic shrubs include *Ericameria ericoides*, *Lupinus*

chamissonis, and *Baccharis pilularis*, and those that are often present include *Lupinus arboreus*. The herbaceous layer typically includes *Achillea millefolium* and *Bromus diandrus*, and herbs that are often present include *Artemisia pycnocephala*, *Carpobrotus edulis*, *Elymus triticoides*, *Eriogonum latifolium*, *Eriophyllum stoechadifolium*, and *Eschscholzia californica*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0.0 – 0.0	no data	no data
Shrub	57.0	48.0 – 65.0	0.6	0 – 1
Herb	22.2	2 – 52	0.3	0 – 1

Local Membership Rule

Ericameria ericoides and/or *Lupinus chamissonis* dominate as individuals or in combination as co- dominants with *Baccharis pilularis* or *Lupinus arboreus*.

Local Environmental Description

Elevation: Mean 54 m, Range 9 – 112 m

Aspect: SW (2), Flat (1), NW (1)

Slope: Mean 9 degrees, Range 0 – 19 degrees

Macro Topography: Middle 1/3 of slope (2), Bottom to Lower 1/3 of slope (1), Middle to Upper 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 42.2%, Range 10.0 – 88.0%

Litter Cover: Mean 27.2%, Range 1.0 – 87%

Soil Texture (field assessed): Sand, (class unknown) (3), Medium sand (1)

Geology (field or map data): Sand dunes (3), Sandstone and other sedimentary (1), Volcanic and metavolcanic rocks (1)

San Mateo County Watersheds: San Francisco Coastal (4), San Francisco Bayside (3), Ano Nuevo (1)

Other Watersheds, San Francisco Co.: San Francisco Bayside (3), San Francisco Coastal (1)

Site Impacts

This alliance has low non-native plant cover (average 15.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Brassica nigra*, *Bromus diandrus*, *Bromus hordeaceus*, *Carpobrotus edulis*, *Cerastium glomeratum*, *Conicosia pugioniformis*, *Rumex acetosella*, and *Vulpia bromoides*.

Associations in San Mateo County

- *Lupinus chamissonis*
- *Lupinus chamissonis* – *Ericameria ericoides*

Classification Comments

None.

References: Bluestone 1981, Holton and Johnson 1979, Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: G3

State Rarity Rank: S3

Surveys Used for Description

Total: N=8; San Mateo County (n=4): PGA1747, PGA1750, SMAT0166, SMAT0219
San Francisco County (n=4): GGNRA391, SMAT0225, YERBA07, YERBA08

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Lupinus chamissonis</i>	87.5	41.0	20.2	0.2	60	Y		Y	Y
	<i>Ericameria ericoides</i>	75.0	36.8	27.8	1	55	Y		Y	Y
	<i>Baccharis pilularis</i>	75.0	11.0	7.2	1	20	Y			Y
	<i>Lupinus arboreus</i>	50.0	2.0	1.7	0.2	8				Y
	<i>Diplacus aurantiacus</i>	37.5	1.6	1.4	0.2	6				
	<i>Toxicodendron diversilobum</i>	25.0	5.3	4.9	18	21				
	<i>Frangula californica</i>	25.0	0.5	0.4	0.2	3				
	Herb	<i>Camissonia cheiranthifolia</i>	37.5	0.2	0.1	0.2	0.2			
unknown <i>Poaceae</i>		37.5	0.2	0.1	0.2	0.2				
<i>Polypodium californicum</i>		25.0	2.1	3.0	1	23				
<i>Vulpia bromoides</i>		25.0	9.3	2.5	10	10				
<i>Vulpia microstachys</i>		25.0	1.7	2.1	7	10				
<i>Conicosia pugioniformis</i>		25.0	0.5	0.7	0.2	5				
<i>Scrophularia californica</i>		25.0	1.6	0.4	0.2	3				
<i>Rumex acetosella</i>		25.0	0.3	0.3	0.2	2				
<i>Pterostegia drymarioides</i>		25.0	0.5	0.2	0.2	1				
<i>Cerastium glomeratum</i>		25.0	0.2	0.1	0.2	0.2				
<i>Bromus hordeaceus</i>		25.0	0.2	0.1	0.2	0.2				
<i>Pseudognaphalium</i>		25.0	0.2	0.1	0.2	0.2				

Lupinus chamissonis – *Ericameria ericoides* Shrubland Alliance

	<i>stramineum</i>					
	<i>Amsinckia spp.</i>	25.0	0.2	0.1	0.2	0.2
	<i>Fragaria chiloensis</i>	25.0	0.2	0.1	0.2	0.2
	<i>Camissonia cheiranthifolia</i>	37.5	0.2	0.1	0.2	0.2
	<i>unknown Poaceae</i>	37.5	0.2	0.1	0.2	0.2
	<i>Polypodium californicum</i>	25.0	2.1	3.0	1	23
	<i>Vulpia bromoides</i>	25.0	9.3	2.5	10	10
	<i>Vulpia microstachys</i>	25.0	1.7	2.1	7	10
	<i>Conicosia pugioniformis</i>	25.0	0.5	0.7	0.2	5
	<i>Scrophularia californica</i>	25.0	1.6	0.4	0.2	3
	<i>Rumex acetosella</i>	25.0	0.3	0.3	0.2	2
	<i>Pterostegia drymarioides</i>	25.0	0.5	0.2	0.2	1
	<i>Cerastium glomeratum</i>	25.0	0.2	0.1	0.2	0.2
	<i>Bromus hordeaceus</i>	25.0	0.2	0.1	0.2	0.2
	<i>Pseudognaphalium stramineum</i>	25.0	0.2	0.1	0.2	0.2
	<i>Amsinckia spp.</i>	25.0	0.2	0.1	0.2	0.2
	<i>Fragaria chiloensis</i>	25.0	0.2	0.1	0.2	0.2
Non-Vascular						
	Moss	37.5	37.5	0.2	0.2	1

***Lupinus chamissonis* Association**

Common Name: Dune Lupine Shrubland

Alliance: *Lupinus chamissonis* – *Ericameria ericoides* Shrubland Alliance

Local Vegetation Description

The Dune Lupine Association forms an open to intermittent shrub layer. The emergent tree layer is typically absent, and the herbaceous layer is open to intermittent. Dominant and characteristic shrubs include *Lupinus chamissonis*, and those that are often present include *Baccharis pilularis* and *Lupinus arboreus*. The herbaceous layer typically includes *Carpobrotus edulis*, and herbs that are often present include *Abronia latifolia*, *Achillea millefolium*, *Bromus diandrus*, *Bromus maritimus*, *Camissonia cheiranthifolia*, *Chorizanthe cuspidata*, *Claytonia perfoliata*, *Elymus pacificus*, *Erigeron glaucus*, *Eriogonum latifolium*, *Eriophyllum stoechadifolium*, *Eschscholzia californica*, *Galium aparine*, *Marah fabaceus*, *Pterostegia drymarioides*, *Stellaria media*, and *Vulpia bromoides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	46.7	20.0 – 65.0	0.3	0 – 0.5
Herb	33.3	15 – 60	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 41 m, Range 21 – 112 m

Aspect: NW (2), SW (1)

Slope: Mean 9 degrees, Range 2 – 14 degrees

Macro Topography: no data

Large Rock: no data

Small Rock: no data

Fines Cover: Mean 9.1%, Range 7.3 – 12.0%

Litter Cover: no data

Soil Texture (field assessed): no data

Geology (field or map data): Marine and nonmarine sand deposits (3), Sandstone and other sedimentary (2), Volcanic and metavolcanic rocks (1)

San Mateo County Watersheds: San Francisco Coastal (2)

Other Watersheds, Marin Co.: Point Reyes (4)

Site Impacts

Lupinus chamissonis Association
Lupinus chamissonis – *Ericameria ericoides* Shrubland Alliance

This association has moderate non-native plant cover (average 20.9%) relative to native cover. Non- native species that occur with highest frequency and abundance include *Brassica nigra*, *Bromus diandrus*, *Carpobrotus edulis*, *Stellaria media*, and *Vulpia bromoides*.

Classification Comments

Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Holton and Johnson 1979

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=6; San Mateo County (n=2): PGA1747, PGA1750

Marin County (n=4): PGA311, SFAND01, SFAND05, SFAND06

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub										
	<i>Lupinus chamissonis</i>	100.0	69.9	31.3	12	60		Y		Y
	<i>Baccharis pilularis</i>	50.0	17.9	12.4	2.7778	56.25				Y
	<i>Lupinus arboreus</i>	50.0	7.3	4.2	0.6944	17.361				Y
	<i>Toxicodendron diversilobum</i>	33.3	4.9	2.9	6.9444	10.417				
Herb										
	<i>Carpobrotus edulis</i>	83.3	19.0	12.1	0.2	37				Y
	<i>Eschscholzia californica</i>	66.7	6.5	3.8	2.8667	7.3333				Y
	<i>Achillea millefolium</i>	66.7	3.7	1.0	0.2	5				Y
	<i>Stellaria media</i>	50.0	6.5	4.8	4	14				Y
	<i>Marah fabaceus</i>	50.0	6.0	5.3	3.5	22.9				Y
	<i>Eriophyllum stoechadifolium</i>	50.0	5.3	2.3	0.6944	8				Y
	<i>Pterostegia drymarioides</i>	50.0	5.1	3.4	1.5333	14.867				Y
	<i>Eriogonum latifolium</i>	50.0	4.9	3.4	0.2	15.278				Y
	<i>Bromus maritimus</i>	50.0	2.8	1.7	1.5333	6.6667				Y
	<i>Chorizanthe cuspidata</i>	50.0	2.7	1.4	0.2	8.2				Y
	<i>Bromus diandrus</i>	50.0	2.7	1.6	0.2	5.3333				Y

<i>Galium aparine</i>	50.0	1.2	1.1	0.2	5.3333	Y
<i>Vulpia bromoides</i>	50.0	1.0	0.6	0.2	2	Y
<i>Elymus pacificus</i>	50.0	1.0	0.8	0.2	2.4	Y
<i>Abronia latifolia</i>	50.0	0.8	0.5	0.2	2	Y
<i>Claytonia perfoliata</i>	50.0	0.6	0.5	0.6667	1.3333	Y
<i>Erigeron glaucus</i>	50.0	0.4	0.4	0.2	2.0833	Y
<i>Camissonia cheiranthifolia</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Artemisia pycnocephala</i>	33.3	5.2	3.2	2	17	
<i>Brassica nigra</i>	33.3	1.2	0.4	0.2	2	
<i>Forb (herbaceous, not grass nor grasslike)</i>	33.3	0.4	0.3	0.6667	0.8667	
<i>Daucus pusillus</i>	33.3	0.3	0.2	0.2	0.8667	
<i>Monardella sinuata ssp. Nigrescens</i>	33.3	0.3	0.1	0.2	0.6667	
<i>Cardionema ramosissimum</i>	33.3	0.1	0.1	0.2	0.2	

***Lupinus chamissonis* – *Ericameria ericoides* Association**

Common Name: Dune Lupine – Heather Goldenbush Shrubland

Alliance: *Lupinus chamissonis* – *Ericameria ericoides* Shrubland Alliance

Local Vegetation Description

The Dune Lupine – Heather Goldenbush Association forms an intermittent shrub layer. The emergent tree layer is typically absent, and the herbaceous layer is open to intermittent. Dominant and characteristic shrubs include *Ericameria ericoides*, *Baccharis pilularis*, and *Lupinus chamissonis*, and those that are often present include *Diplacus aurantiacus* and *Lupinus arboreus*. The herbaceous layer typically includes *Achillea millefolium* and *Bromus diandrus*, and herbs that are often present include *Artemisia pycnocephala*, *Bromus carinatus*, *Camissonia cheiranthifolia*, *Carpobrotus edulis*, *Chlorogalum pomeridianum*, *Cirsium occidentale*, *Dudleya farinosa*, *Elymus triticoides*, *Eriogonum latifolium*, *Eriophyllum stoechadifolium*, *Eschscholzia californica*, *Marah fabaceus*, *Polygonum paronychia*, and *Pteridium aquilinum*. Commonly associated non-vascular plants include Moss.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0.2	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	55.0	48.0 – 60.0	0.6	0 – 1
Herb	26.7	2 – 52	0.4	0 – 1

Local Environmental Description

Elevation: Mean 50 m, Range 9 – 65 m

Aspect: SW (2), NW (1), Flat (1)

Slope: Mean 9 degrees, Range 0 – 19 degrees

Macro Topography: Middle 1/3 of slope (2), Bottom to Lower 1/3 of slope (1), Middle to Upper 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 42.2%, Range 10 – 88%

Litter Cover: Mean 27.2%, Range 1 – 87%

Soil Texture (field assessed): Sand, (class unknown) (3), Medium sand (1)

Geology (field or map data): Sand dunes (3)

San Mateo County Watersheds: Ano Nuevo (1), San Francisco Coastal (1)

Other Watersheds, San Francisco Co.: San Francisco Bayside (2), San Francisco Coastal (1)

Site Impacts

This association has low non-native plant cover (average 14.3%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Bromus diandrus*, *Carpobrotus edulis*, *Cerastium glomeratum*, *Conicosia pugioniformis*, *Rumex acetosella*, and *Vulpia bromoides*.

Classification Comments

Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Holton and Johnson 1979, Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: G2

State Rarity Rank: S2.2

State Rare: Y

Surveys Used for Description

Total: N=6; San Mateo County (n=2): SMAT0166, SMAT0219

San Francisco County (n=4): GGNRA391, SMAT0225, YERBA07, YERBA08

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Ericameria ericoides</i>	100.0	49.1	37.0	1	55			Y	Y
	<i>Baccharis pilularis</i>	100.0	14.7	9.5	1	20				Y
	<i>Lupinus chamissonis</i>	83.3	21.3	10.2	0.2	30				Y
	<i>Lupinus arboreus</i>	66.7	2.6	2.2	0.2	8				Y
	<i>Diplacus aurantiacus</i>	50.0	2.1	1.9	0.2	6				Y
Regenerating or Shrubby Trees	<i>Quercus agrifolia</i> *	50	16.7	0.1	0.2	0.2				Y
	<i>Quercus kelloggii</i> *	50	16.7	0.1	0.2	0.2				Y
	<i>Umbellularia californica</i> *50	50	16.7	0.1	0.2	0.2				Y
Shrub	<i>Ericameria ericoides</i>	100.0	49.1	37.0	1	55			Y	Y
	<i>Baccharis pilularis</i>	100.0	14.7	9.5	1	20				Y
	<i>Lupinus chamissonis</i>	83.3	21.3	10.2	0.2	30				Y
	<i>Lupinus arboreus</i>	66.7	2.6	2.2	0.2	8				Y
	<i>Diplacus aurantiacus</i>	50.0	2.1	1.9	0.2	6				Y

Lupinus chamissonis – *Ericameria ericoides* Association
Lupinus chamissonis – *Ericameria ericoides* Shrubland Alliance

Herb	<i>Toxicodendron diversilobum</i>	33.3	7.1	6.5	18	21	
	<i>Frangula californica</i>	33.3	0.6	0.5	0.2	3	
	<i>Bromus diandrus</i>	100.0	19.6	14.5	0.2	52	Y
	<i>Achillea millefolium</i>	83.3	2.5	1.7	0.2	6	Y
	<i>Eschscholzia californica</i>	66.7	6.2	6.5	0.2	19	Y
	<i>Elymus triticoides</i>	66.7	1.6	1.1	0.2	4	Y
	<i>Eriophyllum stoechadifolium</i>	50.0	16.2	3.2	0.2	15	Y
	<i>Pteridium aquilinum</i>	50.0	6.6	3.9	0.2	15	Y
	<i>Marah fabaceus</i>	50.0	5.1	4.2	4	13	Y
	<i>Polygonum paronychia</i>	50.0	3.8	1.4	0.2	7	Y
	<i>Chlorogalum pomeridianum</i>	50.0	2.3	2.2	0.2	11	Y
	<i>Eriogonum latifolium</i>	50.0	2.2	1.2	0.2	5	Y
	<i>Carpobrotus edulis</i>	50.0	2.0	0.4	0.2	2.2	Y
	<i>Bromus carinatus</i>	50.0	1.6	1.3	1	6	Y
	<i>Cirsium occidentale</i>	50.0	1.6	0.5	0.2	2	Y
	<i>Artemisia pycnocephala</i>	50.0	1.0	0.9	0.2	5	Y
	<i>Dudleya farinosa</i>	50.0	0.5	0.5	0.2	2	Y
	<i>Camissonia cheiranthifolia</i>	50.0	0.2	0.1	0.2	0.2	Y
	<i>Vulpia bromoides</i>	33.3	12.3	3.3	10	10	
	<i>Polypodium californicum</i>	33.3	2.8	4.0	1	23	
	<i>Vulpia microstachys</i>	33.3	2.3	2.8	7	10	
	<i>Scrophularia californica</i>	33.3	2.1	0.5	0.2	3	
	<i>Pterostegia drymarioides</i>	33.3	0.7	0.2	0.2	1	
	<i>Conicosia pugioniformis</i>	33.3	0.6	0.9	0.2	5	
	<i>Rumex acetosella</i>	33.3	0.4	0.4	0.2	2	
	<i>Fragaria chiloensis</i>	33.3	0.3	0.1	0.2	0.2	
	<i>Pseudognaphalium stramineum</i>	33.3	0.2	0.1	0.2	0.2	
	<i>Cerastium glomeratum</i>	33.3	0.2	0.1	0.2	0.2	
	<i>Amsinckia spp.</i>	33.3	0.2	0.1	0.2	0.2	
	<i>unknown Poaceae</i>	33.3	0.2	0.1	0.2	0.2	
Non-Vascular	Moss	50.0	50.0	0.2	0.2	1	Y

***Prunus ilicifolia* – *Heteromeles arbutifolia* – *Ceanothus spinosus* Shrubland Alliance**



Common Name: Holly leaf cherry – toyon – greenbark ceanothus chaparral

NVC Alliance Code: A3863. *Prunus ilicifolia* - *Heteromeles arbutifolia* - *Ceanothus spinosus* Mesic Chaparral Alliance

Statewide Description

Ceanothus spinosus, *Heteromeles arbutifolia* and/or *Prunus ilicifolia* is dominant or co-dominant in the shrub canopy with *Artemisia californica*, *Ceanothus megacarpus*, *Cercocarpus montanus*, *Clematis lasiantha*, *Diplacus aurantiacus*, *Eriogonum fasciculatum*, *Fraxinus dipetala*, *Keckiella antirrhinoides*, *Keckiella cordifolia*, *Quercus berberidifolia*, *Rhamnus ilicifolia*, *Rhus ovata* and *Salvia mellifera*. Emergent trees may be present at low cover, including *Juglans californica* or *Quercus agrifolia*.

Both *H. arbutifolia* and *P. ilicifolia* are variable in size and growth habit, being low and dense in exposed places, becoming open and rangy, or tree like in protected areas with long intervals between fires. Stands are heterogeneous in mesic chaparral habitats on north-facing slopes. The differences between this and other chaparral types appears to be mostly related to site history, largely time since last fire, fire frequency, and adjacent alliances. In many cases, stands appear to be small fragments in suburban landscapes where fires are rare but human disturbance is high.

Local Vegetation Description

The Holly leaf cherry – toyon – greenbark ceanothus chaparral Alliance forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is open to intermittent. Dominant and characteristic shrubs include *Prunus ilicifolia*, *Heteromeles arbutifolia*, and *Toxicodendron diversilobum*, and those that are often present include *Baccharis pilularis* and *Rubus ursinus*. Commonly associated emergent trees at sparse cover include *Quercus agrifolia*. Herbs that are often present include *Clinopodium douglasii*, *Marah fabaceus*, and *Sanicula crassicaulis*, and herbs that are sometimes present include *Aquilegia formosa*, *Claytonia perfoliata*, *Dryopteris arguta*, *Heracleum maximum*, *Scrophularia californica*, and *Thalictrum fendleri*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.1	0 – 1	7.5	5 – 10
Hardwood	1.1	0 – 10	7.2	2 – 15
Regenerating or Shrubby Tree	0.2	0.0 – 4.0	3.5	2 – 5
Shrub	76.1	45 – 100	3.6	0.5 – 10
Herb	18.6	2 – 65	0.3	0 – 1

Local Membership Rule

Heteromeles arbutifolia, *Prunus ilicifolia*, and/or *Prunus virginiana* dominate or co-dominate in the shrub layer with *Baccharis pilularis*, and/or *Toxicodendron diversilobum*. *Sanicula crassicaulis* and other herbs such as *Clinopodium douglasii* may be present to abundant in the understory.

Local Environmental Description

Elevation: Mean 199 m, Range 102 – 313 m

Aspect: NE (3), NW (2), SE (2), SW (2)

Slope: Mean 16 degrees, Range 3 – 43 degrees

Macro Topography: Middle 1/3 of slope (3), Lower 1/3 of slope (2), Upper 1/3 of slope (2), Other (1), Wash (channel bed) (1)

Large Rock: Mean 1.0%, Range 0.0 – 6.0%

Small Rock: Mean 3.3%, Range 0.0 – 10.0%

Fines Cover: Mean 20.7%, Range 0.2 – 45%

Litter Cover: Mean 25.2%, Range 0.0 – 97%

Soil Texture (field assessed): Medium to very fine, sandy loam (5), Moderately fine sandy clay loam (1), Coarse, loamy sand (1), Medium silt (1), Moderately coarse, sandy loam (1)

Geology (field or map data): Volcanic and metavolcanic rocks (10), Franciscan melange (10), Sandstone and other sedimentary (3), Greenstone (1), Shale and other sedimentary (1)

San Mateo County Watersheds: San Mateo Bayside (20), Half Moon Bay (4), Palo Alto (1)

Prunus ilicifolia – *Heteromeles arbutifolia* – *Ceanothus spinosus* Shrubland Alliance

Site Impacts

This alliance has low non-native plant cover (average 2.7%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Capsella bursa-pastoris*, *Carduus pycnocephalus*, and *Conium maculatum*.

Associations in San Mateo County

- *Prunus ilicifolia* ssp. *ilicifolia* – *Heteromeles arbutifolia*
- *Prunus ilicifolia* ssp. *ilicifolia* / *Sanicula crassicaulis*

Classification Comments

Transitional stands of *Prunus virginiana* may occur very infrequently and they are associated with this alliance of northerly mesic slope stands.

References: Borchert et al. 2004, Boul et al. 2011, Evens and San 2005, Keeler-Wolf and Evens 2006, Keeler-Wolf et al. 2003a, Kittel et al. 2012, Klein and Evens 2005

Global Rarity Rank: G5

State Rarity Rank: S4

Surveys Used for Description

Total: N=27; San Mateo County (n=27): GGNRA313, GGNRA314, GGNRA320, GGNRA324, GGNRA339, GGNRA349, GGNRA350, PGA1008, PGA1010, PGA1018, PGA10181, PGA1024, PGA1775, PGA1779, PGA1794, PGA1844, PGA702, PGA703, PGA705, PGA710, PGA909, PGA915, PGA962, PGA968, PWMIC01A, SMAT0157, SMAT0250

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	25.9	20.1	0.4	0.2	3				
Shrub	<i>Toxicodendron diversilobum</i>	92.6	14.1	13.6	0.2	42	Y			Y
	<i>Prunus ilicifolia</i>	88.9	34.0	31.6	2	70	Y		Y	Y
	<i>Heteromeles arbutifolia</i>	81.5	16.1	13.5	0.2	65	Y			Y
	<i>Rubus ursinus</i>	70.4	7.7	8.3	0.2	50				Y
	<i>Baccharis pilularis</i>	66.7	9.2	7.4	0.2	62				Y
	<i>Dirca occidentalis</i>	33.3	1.2	1.2	0.2	23				
	<i>Lonicera hispidula</i>	33.3	1.1	1.0	0.2	10				
	<i>Ceanothus thyrsiflorus</i>	29.6	1.9	2.0	1	35				
	<i>Oemleria cerasiformis</i>	25.9	1.2	0.9	0.2	15				
	<i>Diplacus aurantiacus</i>	25.9	0.7	0.4	0.2	6				
	<i>Ribes spp.</i>	25.9	0.3	0.2	0.2	2				

Prunus ilicifolia – *Heteromeles arbutifolia* – *Ceanothus spinosus* Shrubland Alliance

Herb

<i>Marah fabaceus</i>	55.6	8.1	2.3	0.2	10	Y
<i>Sanicula crassicaulis</i>	51.9	14.4	4.7	0.2	30	Y
<i>Clinopodium douglasii</i>	51.9	5.3	0.7	0.2	6	Y
<i>Dryopteris arguta</i>	48.1	24.3	3.3	0.2	25	
<i>Heracleum maximum</i>	48.1	9.4	1.8	0.2	10	
<i>Scrophularia californica</i>	44.4	3.1	1.1	0.2	10	
<i>Claytonia perfoliata</i>	22.2	2.1	1.0	0.2	25.2	
<i>Thalictrum fendleri</i>	22.2	4.2	1.0	0.2	20	
<i>Aquilegia formosa</i>	22.2	0.3	0.0	0.2	0.2	

***Prunus ilicifolia* ssp. *Ilicifolia* – *Heteromeles arbutifolia* Association**

Common Name: Holly Leaf Cherry – Toyon Shrubland

Alliance: *Prunus ilicifolia* – *Heteromeles arbutifolia* – *Ceanothus spinosus* Shrubland Alliance

Local Vegetation Description

The Holly Leaf Cherry – Toyon Association forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is open to intermittent. Dominant and characteristic shrubs include *Heteromeles arbutifolia*, *Prunus ilicifolia*, and *Toxicodendron diversilobum*, and those that are often present include *Baccharis pilularis*, *Lonicera hispidula*, and *Rubus ursinus*.

Commonly associated emergent trees at sparse cover include *Quercus agrifolia* and *Umbellularia californica*. The herbaceous layer that are often present include *Clinopodium douglasii* and *Dryopteris arguta*, and herbs that are sometimes present include *Heracleum maximum*, *Marah fabaceus*, and *Sanicula crassicaulis*.

Lifeform	Cover (%)		Height (m)	
	Mean	Range	Mean	Range
Conifer	2.3	0 – 22	no data	
Hardwood	3.7	0 – 22	3.5	2 – 5
Regenerating or Shrubby Tree	0.0	0 – 0	no data	
Shrub	72.0	45 – 100	3.3	0.5 – 5
Herb	22.1	3 – 60	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 227 m, Range 173 – 313 m Aspect: no data

Slope: no data

Macro Topography: no data

Large Rock: no data

Small Rock: no data

Fines Cover: no data

Litter Cover: no data

Soil Texture (field assessed): no data

Geology (field or map data): Volcanic and metavolcanic rocks (4), Franciscan melange (3), Sandstone and other sedimentary (2)

San Mateo County Watersheds: San Mateo Bayside (6), Half Moon Bay (3)

Prunus ilicifolia ssp. *Ilicifolia* – *Heteromeles arbutifolia* Association
Prunus ilicifolia – *Heteromeles arbutifolia* – *Ceanothus spinosus* Shrubland Alliance

Site Impacts

This association has low non-native plant cover (average 4.6%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Carduus pycnocephalus* and *Conium maculatum*.

Classification Comments

None.

References: Borchert et al. 2004, Boul et al. 2011, Evens and San 2005, Keeler-Wolf and Evens 2006, Keeler-Wolf et al. 2003a, Kittel et al. 2012, Klein and Evens 2005

Global Rarity Rank: G3 **State Rarity Rank:** S3 **State Rare:** Y

Surveys Used for Description

Total: N=10; San Mateo County (n=10): PGA1008, PGA1010, PGA1018, PGA10181, PGA1024, PGA1775, PGA1779, PGA909, PGA962, PGA968

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	30.0	23.3	0.4	0.2	2				
	<i>Umbellularia californica</i>	30.0	18.3	1.1	0.2	10				
Shrub	<i>Heteromeles arbutifolia</i>	100.0	33.4	28.0	10	65			Y	Y
	<i>Prunus ilicifolia</i>	100.0	23.3	19.2	2	40				Y
	<i>Toxicodendron diversilobum</i>	90.0	12.8	10.3	3	25				Y
	<i>Baccharis pilularis</i>	60.0	8.8	5.0	0.2	20				Y
	<i>Rubus ursinus</i>	60.0	6.7	6.8	0.2	20				Y
	<i>Lonicera hispidula</i>	50.0	2.1	2.0	0.2	10				Y
	<i>Diplacus aurantiacus</i>	40.0	1.8	0.8	0.2	6				
	<i>Lepechinia calycina</i>	30.0	0.5	0.3	0.2	3				
	Herb	<i>Dryopteris arguta</i>	70.0	43.3	5.7	2	25			
<i>Clinopodium douglasii</i>		60.0	9.7	1.1	0.2	6				Y
<i>Heracleum maximum</i>		40.0	2.4	1.1	0.2	10				
<i>Marah fabaceus</i>		30.0	3.8	1.5	0.2	10				
<i>Sanicula crassicaulis</i>		30.0	1.2	0.5	0.2	5				

***Prunus ilicifolia* ssp. *Ilicifolia* / *Sanicula crassicaulis* Association**

Common Name: Holly Leaf Cherry / Sanicle Shrubland

Alliance: *Prunus ilicifolia* – *Heteromeles arbutifolia* – *Ceanothus spinosus* Shrubland Alliance

Local Vegetation Description

The Holly Leaf Cherry / Sanicle Association forms a continuous shrub layer. The emergent tree layer is typically sparse, and the herbaceous layer is open to intermittent. Dominant and characteristic shrubs include *Prunus ilicifolia*, *Heteromeles arbutifolia*, and *Toxicodendron diversilobum*, and those that are often present include *Baccharis pilularis* and *Rubus ursinus*. The herbaceous layer typically includes *Marah fabaceus* and *Sanicula crassicaulis*, and herbs that are often present include *Heracleum maximum* and *Scrophularia californica*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	2.3	0 – 22	no data	no data
Hardwood	3.7	0 – 22	3.5	2 – 5
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	72.0	45 – 100	3.3	0.5 – 5
Herb	22.1	3 – 60	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 175 m, Range 143 – 220 m

Aspect: NE (2), SE (2), SW (2), NW (1)

Slope: Mean 11 degrees, Range 3 – 25 degrees

Macro Topography: Middle 1/3 of slope (2), Upper 1/3 of slope (2), Other (1), Wash (channel bed) (1), Lower 1/3 of slope (1)

Large Rock: Mean 1.3%, Range 0.0 – 6.0%

Small Rock: Mean 4.7%, Range 2.0 – 10.0%

Fines Cover: Mean 45.0%, Range 45.0 – 45.0%

Litter Cover: Mean 10.7%, Range 0.2 – 48%

Soil Texture (field assessed): Medium to very fine, sandy loam (4), Coarse, loamy sand (1), Moderately coarse, sandy loam (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Volcanic and metavolcanic rocks (6), Franciscan melange (5), Greenstone (1)

San Mateo County Watersheds: San Mateo Bayside (11), Palo Alto (1)

Site Impacts

Prunus ilicifolia ssp. *Ilicifolia* / *Sanicula crassicaulis* Association
Prunus ilicifolia – *Heteromeles arbutifolia* – *Ceanothus spinosus* Shrubland Alliance

This association has low non-native plant cover (average 1.7%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Conium maculatum* and *Capsella bursa-pastoris*.

Classification Comments

None.

References: Keeler-Wolf et al. 2003a

Global Rarity Rank: G2 **State Rarity Rank:** S2? **State Rare:** Y

Surveys Used for Description

Total: N=13; San Mateo County (n=13): GGNRA313, GGNRA314, GGNRA320, GGNRA324, GGNRA349, GGNRA350, PGA1844, PGA702, PGA703, PGA705, PGA710, PGA915, SMAT0250

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Prunus ilicifolia</i>	100.0	49.2	46.2	10	70			Y	Y
	<i>Toxicodendron diversilobum</i>	100.0	17.3	17.9	5	42				Y
	<i>Heteromeles arbutifolia</i>	76.9	2.7	2.6	0.2	15				Y
	<i>Rubus ursinus</i>	69.2	9.3	10.6	0.2	50				Y
	<i>Baccharis pilularis</i>	69.2	9.2	8.5	0.2	62				Y
	<i>Dirca occidentalis</i>	46.2	2.4	2.5	0.2	23				
	<i>Oemleria cerasiformis</i>	38.5	2.5	1.8	0.2	15				
	<i>Ceanothus thyrsiflorus</i>	30.8	0.6	0.6	1	3				
	<i>Ribes sanguineum</i>	30.8	0.6	0.5	1	2				
	<i>Ribes spp.</i>	30.8	0.5	0.4	0.2	2				
	<i>Sambucus racemosa</i>	23.1	1.5	1.2	1	8				
	<i>Sambucus nigra</i>	23.1	0.4	0.4	0.2	4				
	<i>Ribes californicum</i>	23.1	0.3	0.3	0.4	2				
	<i>Diplacus aurantiacus</i>	23.1	0.2	0.2	0.2	1				
	Herb	<i>Sanicula crassicaulis</i>	76.9	28.6	9.3	0.2	30			
<i>Marah fabaceus</i>		76.9	9.9	3.2	0.2	10				Y
<i>Heracleum maximum</i>		69.2	17.8	2.8	0.2	8.2				Y
<i>Scrophularia californica</i>		69.2	5.2	2.0	0.2	10				Y
<i>Clinopodium douglasii</i>		46.2	3.1	0.5	0.2	5				
<i>Dryopteris arguta</i>		30.8	7.2	0.9	0.2	8				
<i>Cardamine oligosperma</i>		30.8	0.2	0.1	0.2	0.2				

Prunus ilicifolia ssp. *Illicifolia* / *Sanicula crassicaulis* Association
Prunus ilicifolia – *Heteromeles arbutifolia* – *Ceanothus spinosus* Shrubland Alliance

<i>Conium maculatum</i>	23.1	4.7	2.4	0.2	28
<i>Claytonia perfoliata</i>	23.1	3.9	2.1	0.2	25.2
<i>Thalictrum fendleri</i>	23.1	1.2	0.4	0.2	5
<i>Silybum marianum</i>	23.1	0.3	0.2	0.2	2
<i>Aquilegia formosa</i>	23.1	0.2	0.0	0.2	0.2

***Quercus durata* Shrubland Alliance**



Common Name: Leather oak chaparral

NVC Alliance Code: A3862. *Quercus durata* Ultramafic Chaparral Alliance

Statewide Description

Quercus durata is dominant, co-dominant, or characteristic in the shrub canopy with *Adenostoma fasciculatum*, *Arctostaphylos glandulosa*, *Arctostaphylos glauca*, *Arctostaphylos pungens*, *Arctostaphylos viscida*, *Ceanothus jepsonii*, *Cercocarpus montanus*, *Eriodictyon californicum*, *Fremontodendron californicum*, *Garrya congdonii*, *Heteromeles arbutifolia*, *Quercus berberidifolia*, *Quercus wislizeni*, and *Umbellularia californica*. Emergent trees may be present at low cover, including *Hesperocyparis macnabiana*, *Hesperocyparis sargentii*, *Juniperus californica*, *Pinus attenuata*, or *Pinus sabiniana*.

Stands of this alliance have high fidelity to serpentine or other ultramafic substrates (Alexander et al. 2007, Kruckeberg 1984), typically occupying mesic sites, including north-facing slopes. *Quercus durata* includes two varieties: var. *durata* and var. *gabrielensis*. This alliance mainly describes *Quercus durata* var. *durata*, which grows on serpentine substrates in the Coastal Ranges and the foothills of the Sierra Nevada. The southern variety, *Q. durata* var. *gabrielensis*, occupies barren gneiss-derived soils in the San Gabriel Mountains.

Local Vegetation Description

Quercus durata Shrubland Alliance

The Leather oak chaparral Alliance forms an open to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is open. Dominant and characteristic shrubs include *Quercus durata*, *Adenostoma fasciculatum*, *Frangula californica*, *Heteromeles arbutifolia*, and *Toxicodendron diversilobum*. Commonly associated emergent trees at sparse cover include *Quercus agrifolia* and *Umbellularia californica*. The herbaceous layer typically includes *Chlorogalum pomeridianum*, and herbs that are often present include *Achillea millefolium*, *Lomatium dasycarpum*, and *Marah fabaceus*. Commonly associated non-vascular plants include Lichen and Moss.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	2.2	0 – 6	6.2	2 – 10
Regenerating or Shrubby Tree	0.0	0.0 – 0.2	2.5	1 – 5
Shrub	49.6	23.0 – 75.0	2.3	1 – 5
Herb	11.8	5 – 22	0.3	0 – 0.5

Local Membership Rule

Quercus durata dominates or co-dominates with *Adenostoma fasciculatum* on ultramafic soils.

Heteromeles arbutifolia and/or *Umbellularia californica* are often present in stands.

Local Environmental Description

Elevation: Mean 182 m, Range 130 – 227 m

Aspect: SW (2), NE (2), NW (1)

Slope: Mean 5.4 degrees, Range 2 – 15 degrees

Macro Topography: Middle 1/3 of slope (2), Ridge top (2), Upper 1/3 of slope (1)

Large Rock: Mean 2.6%, Range 0.0 – 6.0%

Small Rock: Mean 9.8%, Range 1.0 – 25.0%

Fines Cover: Mean 27.0%, Range 0.0 – 55.0%

Litter Cover: Mean 58.0%, Range 30.0 – 97%

Soil Texture (field assessed): Moderately fine clay loam (2), Fine silty clay (1), Medium silt loam (1), Medium to very fine, sandy loam (1)

Geology (field or map data): Serpentine (5)

San Mateo County Watersheds: Palo Alto (3), San Mateo Bayside (2)

Site Impacts

This alliance has very low non-native plant cover (average 0.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis* and *Daucus carota*.

Associations in San Mateo County

- *Quercus durata*

- *Quercus durata* – *Adenostoma fasciculatum*

Classification Comments

None.

References: Buck and Evens 2010, Evens and Kentner 2006, Keeler-Wolf et al. 2003a, Klein et al. 2007, Klein et al. 2015

Global Rarity Rank: G4

State Rarity Rank: S4

Surveys Used for Description

Total: N=5; San Mateo County (n=5): SCLAR146, SCLAR148, SCLAR156, SMAT0020, SMAT0091

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	40.0	36.7	2.0	5	5				
	<i>Umbellularia californica</i>	40.0	23.3	0.2	0.2	1				
Regenerating or Shrubby Trees	<i>Quercus agrifolia</i>	20.0	20.0	0.0	0.2	0.2				
Shrub	<i>Quercus durata</i>	100.0	62.3	30.0	20	45	Y	Y		Y
	<i>Adenostoma fasciculatum</i>	100.0	19.2	11.2	0.2	30	Y			Y
	<i>Frangula californica</i>	100.0	7.8	3.8	1	10	Y			Y
	<i>Toxicodendron diversilobum</i>	100.0	4.9	2.7	0.2	5	Y			Y
	<i>Heteromeles arbutifolia</i>	100.0	1.1	0.6	0.2	2	Y			Y
	<i>Ceanothus cuneatus</i>	40.0	3.6	2.6	3	10				
	<i>Baccharis pilularis</i>	20.0	0.3	0.2	1	1				
	<i>Lepechinia calycina</i>	20.0	0.2	0.0	0.2	0.2				
	<i>Lonicera hispidula</i>	20.0	0.1	0.0	0.2	0.2				
	<i>Rhamnus crocea</i>	20.0	0.1	0.0	0.2	0.2				
	<i>Ribes californicum</i>	20.0	0.2	0.0	0.2	0.2				
	<i>Sambucus nigra</i>	20.0	0.1	0.0	0.2	0.2				
	<i>Symphoricarpos mollis</i>	20.0	0.1	0.0	0.2	0.2				
	<i>Eriodictyon californicum</i>	20.0	0.1	0.0	0.2	0.2				

Herb

<i>Chlorogalum pomeridianum</i>	100.0	26.2	2.6	0.2	4	Y	Y
<i>Lomatium dasycarpum</i>	60.0	4.9	0.5	0.2	2		Y
<i>Achillea millefolium</i>	60.0	3.5	0.5	0.2	2		Y
<i>Marah fabaceus</i>	60.0	0.9	0.1	0.2	0.2		Y
unknown Asteraceae	40.0	6.4	1.4	0.2	7		
<i>Pedicularis densiflora</i>	40.0	6.4	1.2	1	5		
<i>Wyethia angustifolia</i>	40.0	3.9	0.6	1	2		
<i>Sanicula crassicaulis</i>	40.0	2.1	0.4	0.2	2		
<i>Monardella villosa</i>	40.0	1.7	0.2	0.2	1		
<i>Claytonia perfoliata</i>	40.0	2.8	0.1	0.2	0.2		
<i>Stachys</i> spp.	40.0	2.4	0.1	0.2	0.2		
<i>Maianthemum racemosum</i>	40.0	0.6	0.1	0.2	0.2		
<i>Scrophularia californica</i>	40.0	2.8	0.1	0.2	0.2		
<i>Lessingia glandulifera</i>	20.0	5.0	0.8	4	4		
<i>Lomatium macrocarpum</i>	20.0	3.7	0.6	3	3		
<i>Plantago erecta</i>	20.0	1.7	0.4	2	2		
<i>Zigadenus fremontii</i>	20.0	0.8	0.2	1	1		
<i>Polygala californica</i>	20.0	2.2	0.2	1	1		
unknown Poaceae	20.0	4.2	0.2	1	1		
<i>Trillium chloropetalum</i>	20.0	0.4	0.0	0.2	0.2		
<i>Scribneria bolanderi</i>	20.0	0.3	0.0	0.2	0.2		
<i>Solanum umbelliferum</i>	20.0	0.8	0.0	0.2	0.2		
<i>Stachys bullata</i>	20.0	0.8	0.0	0.2	0.2		
<i>Pogogyne serpylloides</i>	20.0	2.0	0.0	0.2	0.2		
<i>Anagallis arvensis</i>	20.0	0.8	0.0	0.2	0.2		
<i>Nassella lepida</i>	20.0	2.0	0.0	0.2	0.2		
<i>Mimulus douglasii</i>	20.0	0.3	0.0	0.2	0.2		
<i>Lotus strigosus</i>	20.0	0.8	0.0	0.2	0.2		
<i>Galium</i> spp.	20.0	0.4	0.0	0.2	0.2		
<i>Galium aparine</i>	20.0	2.0	0.0	0.2	0.2		
<i>Eriophyllum lanatum</i>	20.0	0.3	0.0	0.2	0.2		
<i>Epilobium minutum</i>	20.0	2.0	0.0	0.2	0.2		
<i>Elymus glaucus</i>	20.0	0.4	0.0	0.2	0.2		
<i>Daucus carota</i>	20.0	2.0	0.0	0.2	0.2		
<i>Crassula connata</i>	20.0	0.8	0.0	0.2	0.2		
<i>Aster</i> spp.	20.0	0.4	0.0	0.2	0.2		
<i>Nassella</i> spp.	20.0	0.3	0.0	0.2	0.2		
<i>Galium porrigens</i>	20.0	0.8	0.0	0.2	0.2		

Non-Vascular

Moss	60.0	36.7	1.1	0.2	5		Y
Lichen	60.0	23.3	0.3	0.2	1		Y

Quercus durata Association

Common Name: Leather Oak Shrubland

Alliance: *Quercus durata* Shrubland Alliance

Local Vegetation Description

The Leather Oak Association forms an open to intermittent shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is open. Dominant and characteristic shrubs include *Quercus durata*, *Adenostoma fasciculatum*, *Frangula californica*, *Heteromeles arbutifolia*, and *Toxicodendron diversilobum*, and those that are often present include *Lepechinia calycina* and *Ribes californicum*. Commonly associated emergent trees at sparse cover include *Umbellularia californica* and *Quercus agrifolia*. The herbaceous layer typically includes *Chlorogalum pomeridianum*, *Maianthemum racemosum*, *Marah fabaceus*, *Pedicularis densiflora*, *Sanicula crassicaulis*, and *Wyethia angustifolia*, and herbs that are often present include *Achillea millefolium*, *Aster* spp., *Elymus glaucus*, *Galium* spp., *Lomatium dasycarpum*, *Monardella villosa*, *Plantago erecta*, *Polygala californica*, *Stachys* spp., *Trillium chloropetalum*, and *Zigadenus fremontii*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	3.1	0.2 – 6	5.5	2 – 10
Regenerating or Shrubby Tree	0.0	0 – 0	1.5	1 – 2
Shrub	34.1	23 – 45.2	2.5	1 – 5
Herb	14.5	7 – 22	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 191 m, Range 188 – 193 m

Aspect: NE (2)

Slope: Mean 3 degrees, Range 2 – 4 degrees

Macro Topography: Ridge top (2)

Large Rock: Mean 0.5%, Range 0.0 – 1.0%

Small Rock: Mean 1.0%, Range 1.0 – 1.0%

Fines Cover: Mean 0.1%, Range 0.0 – 0.2%

Litter Cover: Mean 96.0%, Range 95.0 – 97%

Soil Texture (field assessed): Medium silt loam (1), Fine silty clay (1)

Geology (field or map data): Serpentine (2)

San Mateo County Watersheds: Palo Alto (2)

Site Impacts

This association has very low non-native plant cover (average 0.0%) relative to native cover. No non-native species were recorded by the surveyors.

Classification Comments

None.

References: Klein et al. 2007

Global Rarity Rank: GNR State Rarity Rank: SNR State Rare: N

Surveys Used for Description

Total: N=2; San Mateo County (n=2): SCLAR148, SCLAR156

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Umbellularia californica</i>	100.0	58.3	0.6	0.2	1		Y		Y
	<i>Quercus agrifolia</i>	50.0	41.7	2.5	5	5				Y
Shrub	<i>Quercus durata</i>	100.0	82.2	27.5	20	35		Y		Y
	<i>Frangula californica</i>	100.0	8.8	3.0	2	4				Y
	<i>Toxicodendron diversilobum</i>	100.0	6.0	2.6	0.2	5				Y
	<i>Adenostoma fasciculatum</i>	100.0	1.5	0.6	0.2	1				Y
	<i>Heteromeles arbutifolia</i>	100.0	0.7	0.2	0.2	0.2				Y
	<i>Ribes californicum</i>	50.0	0.4	0.1	0.2	0.2				Y
	<i>Lepechinia calycina</i>	50.0	0.4	0.1	0.2	0.2				Y
	Herb	<i>Chlorogalum pomeridianum</i>	100.0	30.2	4.0	4	4			Y
<i>Pedicularis densiflora</i>		100.0	16.0	3.0	1	5				Y
unknown Asteraceae		100.0	15.9	3.6	0.2	7				Y
<i>Wyethia angustifolia</i>		100.0	9.7	1.5	1	2				Y
<i>Sanicula crassicaulis</i>		100.0	5.3	1.1	0.2	2				Y
<i>Maianthemum racemosum</i>		100.0	1.5	0.2	0.2	0.2				Y
<i>Marah fabaceus</i>		100.0	1.5	0.2	0.2	0.2				Y
<i>Polygala californica</i>		50.0	5.4	0.5	1	1				Y
<i>Plantago erecta</i>		50.0	4.2	1.0	2	2				Y
<i>Zigadenus fremontii</i>		50.0	2.1	0.5	1	1				Y
<i>Stachys spp.</i>		50.0	1.1	0.1	0.2	0.2				Y

Quercus durata Association
Quercus durata Shrubland Alliance

<i>Lomatium dasycarpum</i>	50.0	1.1	0.1	0.2	0.2	Y
<i>Trillium chloropetalum</i>	50.0	1.1	0.1	0.2	0.2	Y
<i>Aster spp.</i>	50.0	1.1	0.1	0.2	0.2	Y
<i>Elymus glaucus</i>	50.0	1.1	0.1	0.2	0.2	Y
<i>Monardella villosa</i>	50.0	1.1	0.1	0.2	0.2	Y
<i>Galium spp.</i>	50.0	1.1	0.1	0.2	0.2	Y
<i>Achillea millefolium</i>	50.0	0.4	0.1	0.2	0.2	Y

***Quercus durata* – *Adenostoma fasciculatum* Provisional Association**

Common Name: Leather Oak – Chamise Shrubland

Alliance: *Quercus durata* Shrubland Alliance

Local Vegetation Description

The Leather Oak – Chamise Association forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse, and the herbaceous layer is open. Dominant and characteristic shrubs include *Adenostoma fasciculatum*, *Frangula californica*, *Quercus durata*, *Heteromeles arbutifolia*, and *Toxicodendron diversilobum*, and those that are often present include *Ceanothus cuneatus*. Commonly associated emergent trees at sparse cover include *Quercus agrifolia*. The herbaceous layer typically includes *Chlorogalum pomeridianum*, and herbs that are often present include *Achillea millefolium*, *Lomatium dasycarpum*, *Claytonia perfoliata*, and *Scrophularia californica*. Commonly associated non-vascular plants include Lichen and Moss.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.5	0 – 1	7.5	5 – 10
Regenerating or Shrubby Tree	0.1	0 – 0.2	3.5	2 – 5
Shrub	60.0	50.0 – 75.0	2.2	1 – 5
Herb	10.0	5 – 20	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 176 m, Range 130 – 227 m

Aspect: SW (2), NW (1)

Slope: Mean 7 degrees, Range 3 – 15 degrees

Macro Topography: Middle 1/3 of slope (2), Upper 1/3 of slope (1)

Large Rock: Mean 4.1%, Range 1 – 6%

Small Rock: Mean 15.7%, Range 7 – 25%

Fines Cover: Mean 45.0%, Range 35 – 55%

Litter Cover: Mean 32.7%, Range 30 – 35%

Soil Texture (field assessed): Moderately fine clay loam (2), Medium to very fine, sandy loam (1)

Geology (field or map data): Serpentine (3)

San Mateo County Watersheds: San Mateo Bayside (2), Palo Alto (1)

Site Impacts

This association has very low non-native plant cover (average 0.2%) relative to native cover. Non-native species that occur with highest frequency and abundance include

Quercus durata – *Adenostoma fasciculatum* Provisional Association
Quercus durata Shrubland Alliance

Anagallis arvensis, *Daucus carota*, and *Galium aparine*.

Classification Comments

This association is considered provisional since it is under-sampled in its expected range.

References: Buck and Evens 2010, Klein et al. 2015

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=3; San Mateo County (n=3): SCLAR146, SMAT0020, SMAT0091

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	33.3	33.3	1.7	5	5				
Regenerating or Shrubby Trees	<i>Quercus agrifolia</i>	33.3	33.3	0.1	0.2	0.2				
Shrub	<i>Quercus durata</i>	100.0	49.1	31.7	20	45			Y	Y
	<i>Adenostoma fasciculatum</i>	100.0	30.9	18.3	10	30			Y	Y
	<i>Frangula californica</i>	100.0	7.1	4.3	1	10				Y
	<i>Toxicodendron diversilobum</i>	100.0	4.3	2.7	0.2	5				Y
	<i>Heteromeles arbutifolia</i>	100.0	1.4	0.8	0.2	2				Y
	<i>Ceanothus cuneatus</i>	66.7	6.1	4.3	3	10				Y
	<i>Baccharis pilularis</i>	33.3	0.6	0.3	1	1				
	<i>Rhamnus crocea</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Eriodictyon californicum</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Sambucus nigra</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Symphoricarpos mollis</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Lonicera hispidula</i>	33.3	0.1	0.1	0.2	0.2				
Herb	<i>Chlorogalum pomeridianum</i>	100.0	23.5	1.7	0.2	3				Y
	<i>Lomatium dasycarpum</i>	66.7	7.5	0.7	0.2	2				Y
	<i>Achillea millefolium</i>	66.7	5.6	0.7	0.2	2				Y
	<i>Scrophularia californica</i>	66.7	4.7	0.1	0.2	0.2				Y

Quercus durata – *Adenostoma fasciculatum* Provisional Association
Quercus durata Shrubland Alliance

<i>Claytonia perfoliata</i>	66.7	4.7	0.1	0.2	0.2			Y
<i>Lessingia glandulifera</i>	33.3	8.3	1.3	4	4			
<i>unknown Poaceae</i>	33.3	6.9	0.3	1	1			
<i>Lomatium macrocarpum</i>	33.3	6.2	1.0	3	3			
<i>Galium aparine</i>	33.3	3.3	0.1	0.2	0.2			
<i>Pogogyne serpylloides</i>	33.3	3.3	0.1	0.2	0.2			
<i>Epilobium minutum</i>	33.3	3.3	0.1	0.2	0.2			
<i>Nassella lepida</i>	33.3	3.3	0.1	0.2	0.2			
<i>Stachys spp.</i>	33.3	3.3	0.1	0.2	0.2			
<i>Daucus carota</i>	33.3	3.3	0.1	0.2	0.2			
<i>Monardella villosa</i>	33.3	2.1	0.3	1	1			
<i>Lotus strigosus</i>	33.3	1.4	0.1	0.2	0.2			
<i>Galium porrigens</i>	33.3	1.4	0.1	0.2	0.2			
<i>Crassula connata</i>	33.3	1.4	0.1	0.2	0.2			
<i>Anagallis arvensis</i>	33.3	1.4	0.1	0.2	0.2			
<i>Solanum umbelliferum</i>	33.3	1.4	0.1	0.2	0.2			
<i>Stachys bullata</i>	33.3	1.4	0.1	0.2	0.2			
<i>Scribneria bolanderi</i>	33.3	0.4	0.1	0.2	0.2			
<i>Mimulus douglasii</i>	33.3	0.4	0.1	0.2	0.2			
<i>Nassella spp.</i>	33.3	0.4	0.1	0.2	0.2			
<i>Marah fabaceus</i>	33.3	0.4	0.1	0.2	0.2			
<i>Eriophyllum lanatum</i>	33.3	0.4	0.1	0.2	0.2			
Non-Vascular								
<i>Moss</i>	100.0	61.1	1.8	0.2	5		Y	Y
<i>Lichen</i>	100.0	38.9	0.5	0.2	1		Y	Y

***Rubus spectabilis* – *Morella californica* Shrubland Alliance**



Common Name: Salmonberry – Wax myrtle scrub

NVC Alliance Code: A2609. *Rubus spectabilis* Wet Shrubland Alliance

Statewide Description

Sawyer et al. (2009) treated *Morella californica* in a separate alliance, and *Rubus spectabilis* was considered more broadly within the mixed *Rubus* (*parviflorus*, *spectabilis*, *ursinus*) Alliance. Recently, the peer review panel of the NVC has determined that these species should be merged into a single alliance due to similar ecological conditions and overlapping species. Thus, *Morella* and *Rubus spectabilis* are now considered together in a single alliance. The treatment below incorporates these new changes.

Morella californica and/or *Rubus spectabilis* dominate or form various mixtures in the shrub canopy with *Baccharis pilularis*, *Garrya elliptica*, *Gaultheria shallon*, *Holodiscus discolor*, *Lonicera involucrata*, *Marah fabaceus*, *Ribes sanguineum*, *Rubus parviflorus*, *Rubus ursinus*, *Sambucus racemosa*, *Toxicodendron diversilobum*, and *Vaccinium ovatum*. Emergent trees may be present at low cover, including *Picea sitchensis* or *Pinus contorta* ssp. *contorta*.

Morella californica and/or *Rubus spectabilis* stands are generally small (< 1 ha) and close to the coast on moist or wet soils with high water tables. Stands scattered in ravines of San Mateo Co., at Point Reyes National Seashore (Keeler-Wolf et al. 2003a), at Bodega Bay and other Sonoma County coastal settings, and in the Lanphere Dunes unit of

Humboldt Bay Refuge characterize the alliance.

Rubus spectabilis and *R. parviflorus* have similar environmental requirements along the coast of northern California. Both tend to occupy swales, moist bluffs, seeps, or riparian borders along with other cold- deciduous shrubs such as *Lonicera involucrata* ssp. *ledebourii*. All stands dominated or co-dominated by these species are considered part of this alliance.

Local Vegetation Description

The Salmonberry – Wax myrtlescrub Alliance forms a continuous shrub layer. The emergent tree layer is typically absent, and the herbaceous layer is sparse to intermittent. Dominant and characteristic shrubs include *Rubus ursinus* and *Toxicodendron diversilobum*, and those that are often present include *Baccharis pilularis*, *Frangula californica*, *Morella californica*, and *Sambucus racemosa*. Herbs that are often present include *Polystichum munitum*, *Pteridium aquilinum*, and *Scrophularia californica*, and herbs that are sometimes present include *Juncus patens*, *Marah fabaceus*, *Marah oreganus*, *Sanicula laciniata*, *Symphotrichum chilense*, and *Urtica dioica*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0.2	12.5	10 – 15
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	86.2	75 – 96	3.5	1 – 10
Herb	10.2	1 – 40	0.5	0 – 1

Local Membership Rule

Vegetation dominated or co-dominated by *Morella californica* and/or *Rubus spectabilis*, or sometimes *Sambucus racemosa* dominates in the shrub overstory. Stands may be small and are generally found close to the coast on moist or wet soils, ravines, and riparian areas. *Sambucus racemosa* stands often preferring riparian streams, seeps along slopes, and moist post-fire slopes where there was past disturbance.

Local Environmental Description

Elevation: Mean 233 m, Range 13 – 476 m

Aspect: NE (4), NW (1), SW (1)

Slope: Mean 13 degrees, Range 8 – 20 degrees

Macro Topography: Middle 1/3 of slope (2), Lower to Middle 1/3 of slope (1), Upper 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: Mean 0.5%, Range 0.0 – 3.0%

Fines Cover: Mean 11.4%, Range 0.2 – 33.0%

Litter Cover: Mean 81.7%, Range 60.0 – 95%

Soil Texture (field assessed): Medium to very fine, sandy loam (1), Muck (1), Medium

loam (1), Fine sandy clay (1)

Geology (field or map data): Sandstone, shale, and conglomerate (2), Granitic (1), Metamorphic (type unknown) (1), Volcanic and metavolcanic rocks (1)

San Mateo County Watersheds: Ano Nuevo (1), Half Moon Bay (1), Pescadero Creek (1), San Francisco Coastal (1), San Mateo Bayside (1)

Site Impacts

This alliance has very low non-native plant cover (average 0.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Arum italicum* and *Geranium dissectum*.

Associations in San Mateo County

- *Morella californica* – *Rubus* spp.
- *Sambucus racemosa* – (*Rubus ursinus*)

Classification Comments

None.

References: Belsher 1999, Buck-Diaz et al. 2020, Keeler-Wolf et al. 2003a, Klein et al. 2015, VegCAMP 2018

Global Rarity Rank: G4

State Rarity Rank: S3

Surveys Used for Description

Total: N=7; San Mateo County (n=7): PGA1011, SMAT0031, SMAT0039, SMAT0178, SMAT0180, YERBA01, YERBA02

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	100	60.2	45.0	40.0	50.0	Y	Y		Y
	<i>Quercus kelloggii</i>	100	18.1	14.0	8.0	20.0	Y			Y
	<i>Umbellularia californica</i>	50	12.5	10.0	20.0	20.0				Y
	<i>Quercus douglasii</i>	50	5.6	4.0	8.0	8.0				Y
	<i>Quercus lobata</i>	50	3.5	2.5	5.0	5.0				Y
Regenerating or Shrubby Trees	<i>Quercus agrifolia</i> *	50	16.7	0.1	0.2	0.2				Y
	<i>Quercus kelloggii</i> *	50	16.7	0.1	0.2	0.2				Y

Rubus spectabilis – *Morella californica* Shrubland Alliance

	<i>Umbellularia californica</i> *50	16.7	0.1	0.2	0.2			Y
Shrub								
	<i>Toxicodendron diversilobum</i>	100.0	3.6	3.8	0.2	10	Y	Y
	<i>Rubus ursinus</i>	85.7	4.2	3.9	0.2	15	Y	Y
	<i>Morella californica</i>	71.4	55.0	56.9	70	100		Y
	<i>Sambucus racemosa</i>	71.4	21.9	19.3	0.2	75		Y
	<i>Baccharis pilularis</i>	71.4	3.6	3.7	0.2	10		Y
	<i>Frangula californica</i>	57.1	8.8	8.9	0.2	30		Y
	<i>Vaccinium ovatum</i>	28.6	1.1	1.5	0.2	10		
Herb								
	<i>Scrophularia californica</i>	71.4	14.6	2.3	0.2	10		Y
	<i>Pteridium aquilinum</i>	71.4	8.9	1.1	0.2	5		Y
	<i>Polystichum munitum</i>	57.1	14.2	1.8	0.2	10		Y
	<i>Urtica dioica</i>	42.9	9.0	1.6	0.2	10		
	<i>Marah fabaceus</i>	42.9	10.1	0.5	0.2	3		
	<i>Marah oreganus</i>	42.9	3.3	0.1	0.2	0.2		
	<i>Sanicula laciniata</i>	28.6	5.5	0.7	0.2	5		
	<i>Juncus patens</i>	28.6	1.4	0.1	0.2	0.2		
	<i>Symphyotrichum chilense</i>	28.6	1.6	0.1	0.2	0.2		
Non-Vascular								
	Moss	42.9	40.5	0.2	0.2	1		

***Morella californica* – *Rubus* spp. Provisional Association**

Common Name: Wax myrtle – berry brambles Shrubland

Alliance: *Rubus spectabilis* – *Morella californica* Shrubland Alliance

Local Vegetation Description

The Wax myrtle – berry brambles Association forms a continuous shrub layer. The emergent tree layer is typically absent, and the herbaceous layer is sparse to open. Dominant and characteristic shrubs include *Morella californica*, *Rubus ursinus*, and *Toxicodendron diversilobum*, and those that are often present include *Baccharis pilularis* and *Sambucus racemosa*. The herbaceous layer typically includes *Pteridium aquilinum*, and herbs that are often present include *Polystichum munitum* and *Scrophularia californica*.

Herbs that are sometimes present include *Juncus patens*, *Marah fabaceus*, *Marah oreganus*, *Sanicula laciniata*, *Symphyotrichum chilense*, and *Urtica dioica*. Commonly associated non-vascular plants include Moss.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.1	0 – 0.2	12.5	10 – 15
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	81.7	70 – 92	4.2	1 – 10
Herb	2.0	1 – 3	0.6	0 – 1

Local Environmental Description

Elevation: Mean 162 m, Range 13 – 244 m

Aspect: NE (3), NW (1), SW (1)

Slope: Mean 12 degrees, Range 8 – 16 degrees

Macro Topography: Middle 1/3 of slope (2), Lower to Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: Mean 0.0%, Range 0.0 – 0.2%

Fines Cover: Mean 7.1%, Range 0.2 – 20.0%

Litter Cover: Mean 86.0%, Range 78.0 – 95%

Soil Texture (field assessed): Fine sandy clay (1), Medium loam (1), Muck (1)

Geology (field or map data): Sandstone, shale, and conglomerate (2), Volcanic and metavolcanic rocks (1)

San Mateo County Watersheds: Ano Nuevo (1), Pescadero Creek (1), San Francisco Coastal (1)

Site Impacts

This association has very low non-native plant cover (average 0.1%) relative to native *Morella californica* – *Rubus* spp. Provisional Association
Rubus spectabilis – *Morella californica* Shrubland Alliance

cover. Non-native species that occur with highest frequency and abundance include *Arum italicum* and *Geranium dissectum*.

Classification Comments

This association is considered provisional since it is under-sampled in its expected range.

References: Buck-Diaz et al. 2020, Klein et al. 2015, VegCAMP 2018

Global Rarity Rank: G3 **State Rarity Rank:** S3 **State Rare:** Y

Surveys Used for Description

Total: N=5; San Mateo County (n=5): SMAT0039, SMAT0178, SMAT0180, YERBA01, YERBA02

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub										
	<i>Morella californica</i>	100.0	77.0	79.6	70	100		Y		Y
	<i>Toxicodendron diversilobum</i>	100.0	3.6	4.1	0.2	10				Y
	<i>Rubus ursinus</i>	80.0	4.4	4.2	0.2	15				Y
	<i>Sambucus racemosa</i>	60.0	4.7	5.0	0.2	20				Y
	<i>Baccharis pilularis</i>	60.0	3.6	4.0	0.2	10				Y
	<i>Frangula californica</i>	40.0	4.5	6.0	0.2	30				
	<i>Vaccinium ovatum</i>	40.0	1.5	2.0	0.2	10				
Herb										
	<i>Pteridium aquilinum</i>	80.0	9.6	0.5	0.2	2				Y
	<i>Polystichum munitum</i>	60.0	18.3	2.4	0.2	10				Y
	<i>Scrophularia californica</i>	60.0	7.1	1.1	0.2	5				Y
	<i>Marah fabaceus</i>	40.0	12.6	0.6	0.2	3				
	<i>Sanicula laciniata</i>	40.0	7.7	1.0	0.2	5				
	<i>Urtica dioica</i>	40.0	6.9	0.2	0.2	1				
	<i>Marah oreganus</i>	40.0	3.1	0.1	0.2	0.2				
	<i>Symphyotrichum chilense</i>	40.0	2.2	0.1	0.2	0.2				
	<i>Juncus patens</i>	40.0	2.0	0.1	0.2	0.2				
Non-Vascular										
	Moss	60.0	56.7	0.3	0.2	1				Y

***Sambucus racemosa* – (*Rubus ursinus*) Provisional Association**

Common Name: Red Elderberry – (California Blackberry) Shrubland

Alliance: *Rubus spectabilis* – *Morella californica* Shrubland Alliance

Local Vegetation Description

The Red Elderberry – (California Blackberry) Shrubland Association forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is sparse to intermittent. Dominant and characteristic shrubs include *Sambucus racemosa* and *Rubus ursinus*, and those that are often present include *Baccharis pilularis*. Commonly associated emergent trees at sparse cover include *Umbellularia californica*. The herbaceous layer that are often present include *Heracleum maximum*, *Polystichum munitum*, *Scrophularia californica*, and *Urtica dioica*, and herbs that are sometimes present include *Marah fabaceus*, *Pteridium aquilinum*, and *Stachys ajugoides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	4.4	0 – 20	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	72.0	50.0 – 85.0	3.1	1 – 5
Herb	26.0	0 – 50	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 263 m, Range 86 – 476 m

Aspect: NE (1)

Slope: Mean 20 degrees, Range 20 – 20 degrees

Macro Topography: Upper 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 3.0%

Fines Cover: 33.0%

Litter Cover: 60%

Soil Texture (field assessed): Medium to very fine, sandy loam (1)

Geology (field or map data): Granitic (3), Metamorphic (type unknown) (1), Sandstone and other sedimentary (1)

San Mateo County Watersheds: Half Moon Bay (1), San Mateo Bayside (1)

Other Watersheds, Marin Co.: Point Reyes (2), Lagunitas Creek (1)

Site Impacts

This association has very low non-native plant cover (average 0.1%) relative to native cover.

Sambucus racemosa – (*Rubus ursinus*) Provisional Association
Rubus spectabilis – *Morella californica* Shrubland Alliance

Classification Comments

This association is new and considered provisional since it is under-sampled in its expected range. Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: none

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=5; San Mateo County (n=2): PGA1011, SMAT0031

Marin County (n=3): PGA3504, PGA4303, PGA5242

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree										
	<i>Umbellularia californica</i>	40.0	36.9	4.6	3	20				
Shrub										
	<i>Sambucus racemosa</i>	100.0	75.7	57.5	35	75		Y		Y
	<i>Rubus ursinus</i>	80.0	4.8	3.8	0.2	10				Y
	<i>Baccharis pilularis</i>	60.0	8.4	5.2	1	20				Y
	<i>Frangula californica</i>	40.0	7.9	6.4	2	30				
	<i>Toxicodendron diversilobum</i>	40.0	1.5	1.2	2	4				
	<i>Ribes spp.</i>	40.0	1.3	1.0	0.2	5				
Herb										
	<i>Scrophularia californica</i>	60.0	14.6	2.8	1	10				Y
	<i>Polystichum munitum</i>	60.0	13.8	0.7	0.2	3				Y
	<i>Urtica dioica</i>	60.0	6.2	2.2	0.2	10				Y
	<i>Heracleum maximum</i>	60.0	3.9	0.7	0.2	3				Y
	<i>Stachys ajugoides</i>	40.0	13.9	6.0	10	20				
	<i>Marah fabaceus</i>	40.0	11.5	0.1	0.2	0.2				
	<i>Pteridium aquilinum</i>	40.0	4.1	1.6	3	5				

***Salix exigua* Shrubland Alliance**



Common Name: Sandbar willow thickets

NVC Alliance Code: A0947. *Salix exigua* Warm Desert Wet Shrubland Alliance

Statewide Description

Salix exigua is dominant or co-dominant in the shrub canopy with *Baccharis* spp., *Brickellia californica*, *Rosa californica*, *Rubus armeniacus*, *Rubus ursinus*, *Salix lasiolepis*, and *Salix melanopsis*. Emergent trees of many different species may be present at low cover.

The *Salix exigua* Alliance is widespread and common throughout California, especially along seasonally or temporarily flowing streams and at seeps. It often forms dense, clonal stands. Great regional variation exists in shrub and understory composition, ranging from Sierran mountain meadow species to those found in Colorado Desert oases. Along the Sacramento River and elsewhere in the Central Valley, *Salix exigua* are the first shrubs to colonize point bars and cut banks, followed in time by *Populus fremontii* and other tall, longer-lived species (Sands 1980). Rivers with flood-control dams in place may have reduced acreage of *Salix exigua* stands with increases in stands of longer-lived tree willows such as *S. gooddingii*, *S. laevigata*, and *S. lucida*.

Local Vegetation Description

The Sandbar willow thickets Alliance forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse, and the herbaceous layer is open. Dominant and characteristic shrubs include *Salix exigua* and *Rubus ursinus*. Regenerating or shrubby trees that are often present include *Acer negundo*. The herbaceous layer typically includes *Helenium puberulum* and *Polygonum punctatum*, and herbs that are often present include *Artemisia douglasiana*, *Centaurium muehlenbergii*, *Cirsium vulgare*, *Epipactis helleborine*, *Pseudognaphalium luteoalbum*, and *Sonchus asper*.

Commonly associated non-vascular plants include Lichen and Moss.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.1	0 – 0.2	10.8	5 – 20
Regenerating or Shrubby Tree	0.1	0 – 0.2	8.0	2 – 15
Shrub	61.8	42 – 75	0.5	0 – 1
Herb	9.3	5 – 15	0.9	0 – 2

Local Membership Rule

Salix exigua dominates along rivers and streams, or close to springs. They are often the first plants to colonize bars and cut banks, followed later by trees such as *Acer* and *Salix* spp.

Local Environmental Description

Elevation: Mean 76 m, Range 40 – 107 m

Aspect: SE (3), NE (1)

Slope: Mean 4 degrees, Range 2 – 6 degrees

Macro Topography: Bottom (2), Bottom to Lower 1/3 of slope (2)

Large Rock: Mean 0.0%, Range 0.0 – 0.0%

Small Rock: Mean 1.3%, Range 0.0 – 5.0%

Fines Cover: Mean 37.0%, Range 3.0 – 87.0%

Litter Cover: Mean 57.8%, Range 6.0 – 95%

Soil Texture (field assessed): Medium silt (1), Moderately fine clay loam (1), Sand, (class unknown) (1), Coarse, loamy sand (1)

Geology (field or map data): Franciscan melange (2), Sandy alluvium (most alluvial fans and washes) (1), Silty alluvium (1)

San Mateo County Watersheds: Palo Alto (1), San Mateo Bayside (1)

Other Watersheds, Marin Co.: Novato (1), Walker Creek (1)

Site Impacts

This alliance has low non-native plant cover (average 4.3%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira caryophylla*, *Amaranthus deflexus*, *Anagallis arvensis*, *Carduus pycnocephalus*, *Cirsium vulgare*, *Conium maculatum*, *Cynodon dactylon*, *Dittrichia graveolens*, *Epipactis helleborine*, *Euphorbia peplus*, *Hirschfeldia incana*, *Leontodon taraxacoides*, *Lythrum tribracteatum*, *Plantago major*, *Polypogon monspeliensis*, *Pseudognaphalium luteoalbum*, *Rumex crispus*, *Rumex pulcher*, *Solanum nigrum*, *Soleirolia soleirolii*, *Sonchus asper*, and *Stellaria media*.

Associations in San Mateo County

- *Salix exigua*

Classification Comments

Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: Buck-Diaz et al. 2012, Evens et al. 2014, Kittel et al. 2012, Klein et al. 2007, Klein et al. 2015, Vaghti 2003

Global Rarity Rank: G5

State Rarity Rank: S4

Surveys Used for Description

Total: N=4; San Mateo County (n=2): SMAT0077, SMAT0242

Marin County (n=2): MARIN050, MARIN290

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Regenerating or Shrubby Trees	<i>Acer negundo</i>	50.0	50.0	0.1	0.2	0.2				Y
	Shrub									
	<i>Salix exigua</i>	100.0	86.1	55.9	38.4	75	Y	Y		Y
	<i>Rubus ursinus</i>	75.0	11.1	7.3	4	15	Y			Y
	<i>Baccharis pilularis</i>	25.0	2.6	1.8	7	7				
	<i>Salix lasiolepis</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Toxicodendron diversilobum</i>	25.0	0.1	0.1	0.2	0.2				
Herb	<i>Polygonum punctatum</i>	75.0	3.8	0.6	0.2	2	Y			Y
	<i>Helenium puberulum</i>	75.0	1.9	0.2	0.2	0.2	Y			Y
	<i>Centaurea muelenbergii</i>	50.0	5.6	0.8	0.2	3				Y
	<i>Pseudognaphalium luteoalbum</i>	50.0	1.8	0.3	0.2	1				Y
	<i>Epipactis helleborine</i>	50.0	1.8	0.1	0.2	0.2				Y
	<i>Sonchus asper</i>	50.0	1.6	0.1	0.2	0.2				Y
	<i>Cirsium vulgare</i>	50.0	1.6	0.1	0.2	0.2				Y
	<i>Artemisia douglasiana</i>	50.0	1.8	0.1	0.2	0.2				Y
	<i>Polygonum amphibium</i>	25.0	16.2	2.5	10	10				
	<i>Marah oreganus</i>	25.0	8.9	0.8	3	3				
	<i>Cynodon dactylon</i>	25.0	4.3	0.8	3	3				

Salix exigua Shrubland Alliance

<i>Conium maculatum</i>	25.0	8.9	0.8	3	3
<i>Schoenoplectus acutus</i>	25.0	3.2	0.5	2	2
<i>Cyperus eragrostis</i>	25.0	2.9	0.5	2	2
<i>Clinopodium douglasii</i>	25.0	6.2	0.3	1	1
<i>Phyla nodiflora</i>	25.0	1.4	0.3	1	1
<i>Typha angustifolia</i>	25.0	1.6	0.3	1	1
<i>Solanum nigrum</i>	25.0	1.4	0.3	1	1
<i>Xanthium strumarium</i>	25.0	1.4	0.3	1	1
<i>Rumex crispus</i>	25.0	0.3	0.1	0.2	0.2
<i>Stellaria media</i>	25.0	0.6	0.1	0.2	0.2
<i>Plantago major</i>	25.0	0.3	0.1	0.2	0.2
unknown <i>Poaceae</i>	25.0	0.3	0.1	0.2	0.2
<i>Potentilla anserina</i>	25.0	0.3	0.1	0.2	0.2
<i>Polypogon interruptus</i>	25.0	0.3	0.1	0.2	0.2
<i>Polypogon monspeliensis</i>	25.0	0.3	0.1	0.2	0.2
<i>Rumex pulcher</i>	25.0	0.3	0.1	0.2	0.2
<i>Rorippa curvisiliqua</i>	25.0	0.3	0.1	0.2	0.2
<i>Soleirolia soleirolii</i>	25.0	1.3	0.1	0.2	0.2
<i>Urtica dioica</i>	25.0	0.3	0.1	0.2	0.2
<i>Thalictrum fendleri</i>	25.0	0.6	0.1	0.2	0.2
<i>Scrophularia californica</i>	25.0	0.6	0.1	0.2	0.2
<i>Solanum americanum</i>	25.0	0.3	0.1	0.2	0.2
<i>Veronica americana</i>	25.0	0.3	0.1	0.2	0.2
<i>Verbena lasiostachys</i>	25.0	1.3	0.1	0.2	0.2
<i>Eleocharis macrostachya</i>	25.0	0.3	0.1	0.2	0.2
<i>Aira caryophyllea</i>	25.0	1.3	0.1	0.2	0.2
<i>Amaranthus deflexus</i>	25.0	0.3	0.1	0.2	0.2
<i>Anagallis arvensis</i>	25.0	0.3	0.1	0.2	0.2
<i>Baccharis glutinosa</i>	25.0	1.3	0.1	0.2	0.2
<i>Barbarea orthoceras</i>	25.0	0.6	0.1	0.2	0.2
<i>Bromus carinatus</i>	25.0	0.6	0.1	0.2	0.2
<i>Cardamine oligosperma</i>	25.0	0.3	0.1	0.2	0.2
<i>Carduus pycnocephalus</i>	25.0	0.6	0.1	0.2	0.2
<i>Chamerion angustifolium</i>	25.0	0.3	0.1	0.2	0.2
<i>Hirschfeldia incana</i>	25.0	0.3	0.1	0.2	0.2
<i>Dittrichia graveolens</i>	25.0	1.3	0.1	0.2	0.2
<i>Mimulus guttatus</i>	25.0	0.3	0.1	0.2	0.2
<i>Iris spp.</i>	25.0	1.3	0.1	0.2	0.2
<i>Lythrum tribracteatum</i>	25.0	0.3	0.1	0.2	0.2
<i>Leontodon taraxacoides</i>	25.0	0.3	0.1	0.2	0.2
<i>Conyza canadensis</i>	25.0	1.3	0.1	0.2	0.2
<i>Isolepis cernua</i>	25.0	0.3	0.1	0.2	0.2
<i>Epilobium ciliatum</i>	25.0	1.3	0.1	0.2	0.2
<i>Heracleum maximum</i>	25.0	0.6	0.1	0.2	0.2
<i>Heliotropium</i>	25.0	0.3	0.1	0.2	0.2

	<i>curassavicum</i>						
	<i>Galium aparine</i>	25.0	0.6	0.1	0.2	0.2	
	<i>Euphorbia peplus</i>	25.0	0.6	0.1	0.2	0.2	
	<i>Epilobium minutum</i>	25.0	1.3	0.1	0.2	0.2	
	<i>Juncus arcticus</i>	25.0	0.3	0.1	0.2	0.2	
Non-Vascular							
	Lichen	50.0	25.0	0.1	0.2	0.2	Y
	Moss	50.0	25.0	0.1	0.2	0.2	Y

Salix exigua Association

Common Name: Narrow-leaf Willow Shrubland

Alliance: *Salix exigua* Shrubland Alliance

Classification Comments

The association circumscription is the same as that of the alliance for the county. See above for detailed description.

References: Buck-Diaz et al. 2012, Evens et al. 2014, Kittel et al. 2012, Klein et al. 2007, Klein et al. 2015, Vaghti 2003

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: N

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Regenerating or Shrubby Trees	<i>Acer negundo</i>	50.0	50.0	0.1	0.2	0.2				Y
	<i>Salix exigua</i>	100.0	86.1	55.9	38.4	75		Y		Y
Shrub	<i>Rubus ursinus</i>	75.0	11.1	7.3	4	15				Y
	<i>Baccharis pilularis</i>	25.0	2.6	1.8	7	7				
	<i>Salix lasiolepis</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Toxicodendron diversilobum</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Polygonum punctatum</i>	75.0	3.8	0.6	0.2	2				Y
	<i>Helenium puberulum</i>	75.0	1.9	0.2	0.2	0.2				Y
Herb	<i>Centaureum muehlenbergii</i>	50.0	5.6	0.8	0.2	3				Y
	<i>Artemisia douglasiana</i>	50.0	1.8	0.1	0.2	0.2				Y
	<i>Epipactis helleborine</i>	50.0	1.8	0.1	0.2	0.2				Y
	<i>Pseudognaphalium luteoalbum</i>	50.0	1.8	0.3	0.2	1				Y
	<i>Sonchus asper</i>	50.0	1.6	0.1	0.2	0.2				Y
	<i>Cirsium vulgare</i>	50.0	1.6	0.1	0.2	0.2				Y
	<i>Polygonum amphibium</i>	25.0	16.2	2.5	10	10				
	<i>Conium maculatum</i>	25.0	8.9	0.8	3	3				
	<i>Marah oreganus</i>	25.0	8.9	0.8	3	3				

<i>Clinopodium douglasii</i>	25.0	6.2	0.3	1	1
<i>Cynodon dactylon</i>	25.0	4.3	0.8	3	3
<i>Schoenoplectus acutus</i>	25.0	3.2	0.5	2	2
<i>Cyperus eragrostis</i>	25.0	2.9	0.5	2	2
<i>Typha angustifolia</i>	25.0	1.6	0.3	1	1
<i>Solanum nigrum</i>	25.0	1.4	0.3	1	1
<i>Xanthium strumarium</i>	25.0	1.4	0.3	1	1
<i>Phyla nodiflora</i>	25.0	1.4	0.3	1	1
<i>Conyza canadensis</i>	25.0	1.3	0.1	0.2	0.2
<i>Aira caryophylla</i>	25.0	1.3	0.1	0.2	0.2
<i>Soleirolia soleirolia</i>	25.0	1.3	0.1	0.2	0.2
<i>Dittrichia graveolens</i>	25.0	1.3	0.1	0.2	0.2
<i>Epilobium minutum</i>	25.0	1.3	0.1	0.2	0.2
<i>Epilobium ciliatum</i>	25.0	1.3	0.1	0.2	0.2
<i>Verbena lasiostachys</i>	25.0	1.3	0.1	0.2	0.2
<i>Baccharis glutinosa</i>	25.0	1.3	0.1	0.2	0.2
<i>Iris spp.</i>	25.0	1.3	0.1	0.2	0.2
<i>Galium aparine</i>	25.0	0.6	0.1	0.2	0.2
<i>Heracleum maximum</i>	25.0	0.6	0.1	0.2	0.2
<i>Euphorbia peplus</i>	25.0	0.6	0.1	0.2	0.2
<i>Bromus carinatus</i>	25.0	0.6	0.1	0.2	0.2
<i>Thalictrum fendleri</i>	25.0	0.6	0.1	0.2	0.2
<i>Scrophularia californica</i>	25.0	0.6	0.1	0.2	0.2
<i>Carduus pycnocephalus</i>	25.0	0.6	0.1	0.2	0.2
<i>Stellaria media</i>	25.0	0.6	0.1	0.2	0.2
<i>Barbarea orthoceras</i>	25.0	0.6	0.1	0.2	0.2
<i>Juncus arcticus</i>	25.0	0.3	0.1	0.2	0.2
<i>Potentilla anserina</i>	25.0	0.3	0.1	0.2	0.2
<i>Rorippa curvisiliqua</i>	25.0	0.3	0.1	0.2	0.2
<i>unknown Poaceae</i>	25.0	0.3	0.1	0.2	0.2
<i>Anagallis arvensis</i>	25.0	0.3	0.1	0.2	0.2
<i>Cardamine oligosperma</i>	25.0	0.3	0.1	0.2	0.2
<i>Hirschfeldia incana</i>	25.0	0.3	0.1	0.2	0.2
<i>Rumex pulcher</i>	25.0	0.3	0.1	0.2	0.2
<i>Plantago major</i>	25.0	0.3	0.1	0.2	0.2
<i>Eleocharis macrostachya</i>	25.0	0.3	0.1	0.2	0.2
<i>Heliotropium curassavicum</i>	25.0	0.3	0.1	0.2	0.2
<i>Polypogon monspeliensis</i>	25.0	0.3	0.1	0.2	0.2
<i>Polypogon interruptus</i>	25.0	0.3	0.1	0.2	0.2
<i>Urtica dioica</i>	25.0	0.3	0.1	0.2	0.2
<i>Mimulus guttatus</i>	25.0	0.3	0.1	0.2	0.2
<i>Veronica americana</i>	25.0	0.3	0.1	0.2	0.2
<i>Lythrum tribracteatum</i>	25.0	0.3	0.1	0.2	0.2
<i>Rumex crispus</i>	25.0	0.3	0.1	0.2	0.2
<i>Chamerion</i>	25.0	0.3	0.1	0.2	0.2

	<i>angustifolium</i>						
	<i>Isolepis cernua</i>	25.0	0.3	0.1	0.2	0.2	
	<i>Leontodon taraxacoides</i>	25.0	0.3	0.1	0.2	0.2	
	<i>Solanum americanum</i>	25.0	0.3	0.1	0.2	0.2	
	<i>Amaranthus deflexus</i>	25.0	0.3	0.1	0.2	0.2	
Non-Vascular							
	Moss	50.0	25.0	0.1	0.2	0.2	Y
	Lichen	50.0	25.0	0.1	0.2	0.2	Y

***Salix hookeriana* – *Salix sitchensis* – *Spiraea douglasii* Shrubland Alliance**



Common Name: Coastal dune willow – Sitka willow – Douglas spiraea thickets

NVC Alliance Code: A3835. *Salix hookeriana* - *Salix sitchensis* - *Spiraea douglasii*
Wet Shrubland Alliance

Statewide Description

Sawyer et al. (2009) treated *Salix hookeriana* and *S. sitchensis* in separate alliances, but the peer review panel of the NVC have recently placed them together in a merged alliance because of ecological similarity. *Salix hookeriana* and/or *S. sitchensis* is dominant or co-dominant in the tall shrub or low tree canopy with *Baccharis pilularis*, *Cornus sericea*, *Morella californica*, *Rubus* spp., and *Salix lasiolepis*. As a shrubland, emergent trees may be present at low cover, including *Alnus rubra*, *Picea sitchensis*, *Populus trichocarpa*, or *Salix lucida*.

Salix sitchensis and *S. hookeriana* range from Alaska to California. These species are ecologically and morphologically similar. They both form moisture-loving, disturbance-related stands. It is the major willow scrub along the moist, northwestern coastal belt of California. It commonly occurs in road banks and along shores of creeks, rivers, lagoons, and dune hollows along the North Coast of California. So far, most willow stands observed in this region are dominated by *S. hookeriana*, though *S. sitchensis* dominant to exist especially further south in the Central Coast of the alliance's range.

Local Vegetation Description

The Coastal dune willow – Sitka willow – Douglas spiraea thickets Alliance forms a continuous shrub layer in the single sample available. The emergent tree layer is typically sparse, and the herbaceous layer is open. Dominant and characteristic shrubs include *Salix sitchensis*, *Baccharis pilularis*, *Cornus sericea*, *Frangula californica*, *Rubus armeniacus*, *Rubus parviflorus*, *Rubus ursinus*, and *Salix lasiolepis*. The herbaceous layer typically includes *Delairea odorata*, *Artemisia douglasiana*, *Conium maculatum*, *Cortaderia jubata*, *Crassula multicava*, *Dryopteris arguta*, *Galium aparine*, *Geranium dissectum*, *Picris echioides*, *Scirpus microcarpus*, *Scrophularia californica*, and *Symphotrichum chilense*. Commonly associated non-vascular plants include Lichen and Moss.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	NA	no data	no data
Hardwood	0.0	NA	no data	no data
Regenerating or Shrubby Tree	0.0	NA	no data	no data
Shrub	75.0	NA	3.5	2 – 5
Herb	10.0	NA	0.3	0 – 0.5

Local Membership Rule

Salix sitchensis dominates or co-dominates with *S. lasiolepis* along coastal or low elevation streams, lagoons. A variety of sub-dominant trees and shrubs may be present, including *Alnus*, *Morella*, and *Rubus*.

Local Environmental Description

Elevation: 10 m

Aspect: Flat (1)

Slope: 0 degrees

Macro Topography: Bottom (1)

Large Rock: 0.0%

Small Rock: 5.0%

Fines Cover: 50.0%

Litter Cover: 42%

Soil Texture (field assessed): Unknown (1)

Geology (field or map data): Alluvium (1)

San Mateo County Watersheds: Pacifica (1)

Site Impacts

This alliance has low non-native plant cover (average 15.5%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Conium maculatum*, *Cortaderia jubata*, *Crassula multicava*, *Delairea odorata*, *Geranium dissectum*, *Picris echioides*, and *Rubus armeniacus*.

Associations in San Mateo County

- *Salix sitchensis*

Classification Comments

None.

References: Buck-Diaz et al. 2020, Klein et al. 2015

Global Rarity Rank: GNR **State Rarity Rank:** SNR

Surveys Used for Description

Total: N=1; San Mateo County (n=1): SMAT0162

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub										
	<i>Salix sitchensis</i>	100.0	57.6	40.0	40	40	Y	Y		Y
	<i>Cornus sericea</i>	100.0	14.4	10.0	10	10	Y			Y
	<i>Salix lasiolepis</i>	100.0	14.4	10.0	10	10	Y			Y
	<i>Rubus ursinus</i>	100.0	7.2	5.0	5	5	Y			Y
	<i>Rubus armeniacus</i>	100.0	2.9	2.0	2	2	Y			Y
	<i>Baccharis pilularis</i>	100.0	2.9	2.0	2	2	Y			Y
	<i>Frangula californica</i>	100.0	0.3	0.2	0.2	0.2	Y			Y
	<i>Rubus parviflorus</i>	100.0	0.3	0.2	0.2	0.2	Y			Y
Herb										
	<i>Delairea odorata</i>	100.0	67.8	8.0	8	8	Y	Y		Y
	<i>Picris echioides</i>	100.0	8.5	1.0	1	1	Y			Y
	<i>Crassula multicava</i>	100.0	8.5	1.0	1	1	Y			Y
	<i>Conium maculatum</i>	100.0	1.7	0.2	0.2	0.2	Y			Y
	<i>Cortaderia jubata</i>	100.0	1.7	0.2	0.2	0.2	Y			Y
	<i>Galium aparine</i>	100.0	1.7	0.2	0.2	0.2	Y			Y
	<i>Geranium dissectum</i>	100.0	1.7	0.2	0.2	0.2	Y			Y
	<i>Artemisia douglasiana</i>	100.0	1.7	0.2	0.2	0.2	Y			Y
	<i>Scrophularia californica</i>	100.0	1.7	0.2	0.2	0.2	Y			Y
	<i>Scirpus microcarpus</i>	100.0	1.7	0.2	0.2	0.2	Y			Y
	<i>Symphotrichum chilense</i>	100.0	1.7	0.2	0.2	0.2	Y			Y
	<i>Dryopteris arguta</i>	100.0	1.7	0.2	0.2	0.2	Y			Y
Non-Vascular										
	Lichen	100.0	50.0	0.2	0.2	0.2	Y	Y		Y
	Moss	100.0	50.0	0.2	0.2	0.2	Y	Y		Y

***Salix sitchensis* Provisional Association**

Common Name: Sitka willow Shrubland

Alliance: *Salix hookeriana* – *Salix sitchensis* – *Spiraea douglasii* Shrubland Alliance

Classification Comments

The association circumscription is the same as that of the alliance for the county. See above for detailed description. This association is considered provisional since it is under-sampled in its expected range.

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Salix sitchensis</i>	100.0	57.6	40.0	40	40		Y		Y
	<i>Cornus sericea</i>	100.0	14.4	10.0	10	10				Y
	<i>Salix lasiolepis</i>	100.0	14.4	10.0	10	10				Y
	<i>Rubus ursinus</i>	100.0	7.2	5.0	5	5				Y
	<i>Baccharis pilularis</i>	100.0	2.9	2.0	2	2				Y
	<i>Rubus armeniacus</i>	100.0	2.9	2.0	2	2				Y
	<i>Frangula californica</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Rubus parviflorus</i>	100.0	0.3	0.2	0.2	0.2				Y
Herb	<i>Delairea odorata</i>	100.0	67.8	8.0	8	8		Y		Y
	<i>Crassula multicava</i>	100.0	8.5	1.0	1	1				Y
	<i>Picris echioides</i>	100.0	8.5	1.0	1	1				Y
	<i>Galium aparine</i>	100.0	1.7	0.2	0.2	0.2				Y
	<i>Symphotrichum chilense</i>	100.0	1.7	0.2	0.2	0.2				Y
	<i>Artemisia douglasiana</i>	100.0	1.7	0.2	0.2	0.2				Y
	<i>Dryopteris arguta</i>	100.0	1.7	0.2	0.2	0.2				Y
	<i>Scrophularia californica</i>	100.0	1.7	0.2	0.2	0.2				Y
	<i>Geranium dissectum</i>	100.0	1.7	0.2	0.2	0.2				Y
	<i>Cortaderia jubata</i>	100.0	1.7	0.2	0.2	0.2				Y
	<i>Scirpus microcarpus</i>	100.0	1.7	0.2	0.2	0.2				Y
	<i>Conium maculatum</i>	100.0	1.7	0.2	0.2	0.2				Y
	Non-Vascular	Moss	100.0	50.0	0.2	0.2	0.2		Y	
Lichen		100.0	50.0	0.2	0.2	0.2		Y		Y

***Salix lasiolepis* Shrubland Alliance**



Common Name: Arroyo willow thickets

NVC Alliance Code: A3878. *Salix lasiolepis* Warm Desert Wet Shrubland Alliance

Statewide Description

Salix lasiolepis is dominant or co-dominant in the tall shrub or low tree canopy with *Acer macrophyllum*, *Baccharis pilularis*, *Baccharis salicifolia*, *Cephalanthus occidentalis*, *Cornus sericea*, *Morella californica*, *Platanus racemosa*, *Populus fremontii*, *Populus trichocarpa*, *Salix* spp., and *Sambucus nigra*. Emergent trees may be present at low cover.

Salix lasiolepis grows on seasonally or intermittently flooded riparian sites. Some plants in California stands are sufficiently tall to be considered trees. Plants are typically shrubby and multi-branched along coastal creeks, at lower and middle elevations, and in parts of the Sacramento–San Joaquin River delta. Some taxonomists recognize varieties: *Salix lasiolepis* var. *bigelovii* is a coastal plant, and *S. lasiolepis* var. *lasiolepis* grows throughout the state (Argus 1997). Disturbances during winter floods modify stands; timing of seed dispersal and spring flood patterns determine seedling success.

Local Vegetation Description

The Arroyo willow thickets Alliance forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is sparse to intermittent. Dominant and characteristic shrubs include *Salix lasiolepis* and *Rubus*

ursinus, and those that are often present include *Toxicodendron diversilobum*. Herbs that are sometimes present include *Clinopodium douglasii*, *Conium maculatum*, *Heracleum maximum*, *Polystichum munitum*, *Sanicula crassicaulis*, *Scrophularia californica*, *Stachys ajugoides*, and *Urtica dioica*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.8	0 – 15	12.5	10 – 15
Hardwood	2.3	0 – 20	5.0	2 – 15
Regenerating or Shrubby Tree	0.5	0 – 10	4.9	1 – 15
Shrub	81.9	41 – 100	3.3	0.5 – 15
Herb	10.6	0 – 50	0.8	0 – 5

Local Membership Rule

Salix lasiolepis dominates or co-dominates with *Rubus* along stream banks and benches, slope seeps, and drainage stringers. Emergent riparian trees are often present, such as *Acer*, *Alnus*, *Fraxinus*, *Salix*, and others.

Local Environmental Description

Elevation: Mean 135 m, Range 11 – 375 m

Aspect: SE (3), SW (3), Flat (3), NW (1), NE (1), Variable (1)

Slope: Mean 5 degrees, Range 0 – 25 degrees

Macro Topography: Bottom (4), Wash (channel bed) (2), Middle 1/3 of slope (1), Bottom to Lower 1/3 of slope (1), Upper 1/3 of slope (1), Draw (1), Lower 1/3 of slope (1), Lower to Middle 1/3 of slope (1)

Large Rock: Mean 0.5%, Range 0.0 – 6.0%

Small Rock: Mean 0.7%, Range 0.0 – 5.0%

Fines Cover: Mean 14.8%, Range 3.0 – 56%

Litter Cover: Mean 56.8%, Range 0.0 – 95%

Soil Texture (field assessed): Sand, (class unknown) (4), Moderately fine sandy clay loam (2), Loam, (class unknown) (2), Moderately fine silty clay loam (2), Not recorded (1), Medium to very fine, sandy loam (1)

Geology (field or map data): Sandstone and other sedimentary (9), Franciscan melange (7), Volcanic and metavolcanic rocks (5), Sand dunes (3), Granitic (1), Mixed alluvium (1), Shale and other sedimentary (1)

San Mateo County Watersheds: San Mateo Bayside (14), San Francisco Coastal (6), Ano Nuevo (2), Half Moon Bay (2), Pescadero Creek (2), Pacifica (1)

Site Impacts

This alliance has low non-native plant cover (average 6.2%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Conium maculatum*.

Associations in San Mateo County

Salix lasiolepis Shrubland Alliance

- *Salix lasiolepis*
- *Salix lasiolepis* – *Rubus* spp.
- *Salix lasiolepis* – *Salix lucida*

Classification Comments

None.

References: AECOM 2013, Buck-Diaz et al. 2012, HDR 2014b, Hickson and Keeler-Wolf 2007, Keeler-Wolf et al. 1998b, Keeler-Wolf et al. 2003a, Klein et al. 2007, Klein et al. 2015, Reyes et al. 2020, Rodriguez et al. 2017, Sproul et al. 2011, Stillwater Sciences and URS 2007, VegCAMP 2015a

Global Rarity Rank: G4

State Rarity Rank: S4

Surveys Used for Description

Total: N=29; San Mateo County (n=29): GGNRA316, GGNRA342, GGNRA379, PGA12798, PGA1757, PGA1772, PGA1774, PGA1777, PGA1780, PGA1783, PGA1791, PGA1817, PGA712, PGA733, PGA734, PGA765, PGA766, PWAWF02A, PWAWF03A, SMAT0013, SMAT0084, SMAT0172, SMAT0200, SMAT0217, SMAT0276, TOKA104, WRBL038, WRBL043, WRBL044

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus agrifolia</i>	100	60.2	45.0	40.0	50.0	Y	Y		Y
	<i>Quercus kelloggii</i>	100	18.1	14.0	8.0	20.0	Y			Y
	<i>Umbellularia californica</i>	50	12.5	10.0	20.0	20.0				Y
	<i>Quercus douglasii</i>	50	5.6	4.0	8.0	8.0				Y
	<i>Quercus lobata</i>	50	3.5	2.5	5.0	5.0				Y
Regenerating or Shrubby Trees	<i>Quercus agrifolia</i> *	50	16.7	0.1	0.2	0.2				Y
	<i>Quercus kelloggii</i> *	50	16.7	0.1	0.2	0.2				Y
	<i>Umbellularia californica</i> *50	50	16.7	0.1	0.2	0.2				Y
Shrub	<i>Salix lasiolepis</i>	96.6	70.2	65.4	35	99	Y	Y		Y
	<i>Rubus ursinus</i>	89.7	11.8	13.8	0.2	63	Y			Y
	<i>Toxicodendron diversilobum</i>	69.0	6.2	7.1	0.2	45				Y
	<i>Baccharis pilularis</i>	31.0	2.1	1.2	1	12				
	<i>Salix lasiolepis</i> Shrubland Alliance									

Herb	<i>Cornus sericea</i>	20.7	1.9	1.6	0.2	20
	<i>Frangula californica</i>	20.7	0.3	0.3	0.2	4
	<i>Scrophularia californica</i>	44.8	3.9	0.3	0.2	3
	<i>Polystichum munitum</i>	31.0	7.1	1.0	0.2	10
	<i>Stachys ajugoides</i>	31.0	4.5	0.2	0.2	2
	<i>Urtica dioica</i>	27.6	9.8	2.5	0.2	30
	<i>Conium maculatum</i>	27.6	2.1	0.4	0.2	8
	<i>Heracleum maximum</i>	24.1	4.2	0.5	0.2	7
	<i>Sanicula crassicaulis</i>	20.7	2.0	0.1	0.2	2
	<i>Clinopodium douglasii</i>	20.7	7.4	0.1	0.2	1

***Salix lasiolepis* Association**

Common Name: Arroyo Willow Riparian Shrubland

Alliance: *Salix lasiolepis* Shrubland Alliance

Local Vegetation Description

The Arroyo Willow Riparian Association forms an intermittent to continuous shrub layer. The emergent tree layer is typically absent, and the herbaceous layer is open to intermittent. Dominant and characteristic shrubs include *Salix lasiolepis*, and those that are often present include *Rubus ursinus* and *Toxicodendron diversilobum*. Herbs that are often present include *Scrophularia californica*, and herbs that are sometimes present include *Conium maculatum*, *Galium aparine*, *Marah fabaceus*, and *Sanicula crassicaulis*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0.2	2.5	1 – 5
Shrub	77.0	40 – 99	3.7	0.5 – 10
Herb	12.5	0 – 50	0.7	0 – 2

Local Environmental Description

Elevation: Mean 116 m, Range 11 – 300 m

Aspect: Flat (1), NE (1), SE (1), Variable (1)

Slope: Mean 5 degrees, Range 0 – 17 degrees

Macro Topography: Bottom (2), Bottom to Lower 1/3 of slope (1), Upper 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: 10.0%

Litter Cover: Mean 65.3%, Range 0.0 – 87%

Soil Texture (field assessed): Sand, (class unknown) (2), Loam, (class unknown) (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Sand dunes (2), Sandstone and other sedimentary (2), Volcanic and metavolcanic rocks (2)

San Mateo County Watersheds: San Francisco Coastal (2), San Mateo Bayside (2), Ano Nuevo (1), Half Moon Bay (1)

Site Impacts

This association has low non-native plant cover (average 5.9%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Conium maculatum*.

Salix lasiolepis Association
Salix lasiolepis Shrubland Alliance

Classification Comments

None.

References: AECOM 2013, Buck-Diaz et al. 2012, HDR 2014b, Hickson and Keeler-Wolf 2007, Keeler-Wolf et al. 1998b, Reyes et al. 2020, Rodriguez et al. 2017, Sproul et al. 2011, VegCAMP 2015a

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=6; San Mateo County (n=6): PGA1774, PGA1791, SMAT0084, SMAT0172, SMAT0217, WRBL038

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Salix lasiolepis</i>	100.0	96.3	76.0	40	99		Y		Y
	<i>Toxicodendron diversilobum</i>	50.0	2.4	2.0	0.2	10				Y
	<i>Rubus ursinus</i>	50.0	0.1	0.1	0.2	0.2				Y
Herb	<i>Scrophularia californica</i>	50.0	5.8	0.6	0.2	3				Y
	<i>Marah fabaceus</i>	33.3	3.2	0.2	0.2	1				
	<i>Conium maculatum</i>	33.3	2.6	0.1	0.2	0.2				
	<i>Sanicula crassicaulis</i>	33.3	2.5	0.4	0.2	2				
	<i>Galium aparine</i>	33.3	1.0	0.1	0.2	0.2				
Non-Vascular	Lichen	33.3	25.0	0.1	0.2	0.2				

***Salix lasiolepis* – *Rubus* spp. Association**

Common Name: Arroyo Willow / Blackberry Shrubland

Alliance: *Salix lasiolepis* Shrubland Alliance

Local Vegetation Description

The Arroyo Willow / Blackberry Association forms an intermittent to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is sparse to intermittent. Dominant and characteristic shrubs include *Salix lasiolepis* and *Rubus ursinus*, and those that are often present include *Toxicodendron diversilobum*. Herbs that are sometimes present include *Avena* spp., *Clinopodium douglasii*, *Conium maculatum*, *Heracleum maximum*, *Polystichum munitum*, *Scrophularia californica*, *Stachys ajugoides*, and *Urtica dioica*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.9	0 – 15	12.5	10 – 15
Hardwood	2.6	0 – 20	5.1	2 – 15
Regenerating or Shrubby Tree	0.2	0 – 3.0	6.5	2 – 15
Shrub	80.1	45.0 – 95.0	4.2	0.5 – 15
Herb	10.2	0 – 40	0.9	0 – 5

Local Environmental Description

Elevation: Mean 142 m, Range 16 – 375 m

Aspect: SW (3), Flat (2), SE (2), NW (1)

Slope: Mean 6 degrees, Range 0 – 25 degrees

Macro Topography: Bottom (2), Wash (channel bed) (2), Lower 1/3 of slope (1), Middle 1/3 of slope (1), Draw (1), Lower to Middle 1/3 of slope (1)

Large Rock: Mean 0.8%, Range 0.0 – 6.0%

Small Rock: Mean 0.9%, Range 0.0 – 5.0%

Fines Cover: Mean 17.6%, Range 3.0 – 56.0%

Litter Cover: Mean 52.6%, Range 3.0 – 95%

Soil Texture (field assessed): Moderately fine silty clay loam (1), Sand, (class unknown) (2), Not recorded (1), Loam, (class unknown) (1), Medium to very fine, sandy loam (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Sandstone and other sedimentary (7), Franciscan melange (6), Volcanic and metavolcanic rocks (3), Sand dunes (1), Granitic (1), Shale and other sedimentary (1)

San Mateo County Watersheds: San Mateo Bayside (11), San Francisco Coastal (4), Pescadero Creek (1), Ano Nuevo (1), Half Moon Bay (1), Pacifica (1)

Site Impacts

This association has low non-native plant cover (average 6.6%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Avena* spp. and *Conium maculatum*.

Classification Comments

The definition of this association has been expanded to include the previously accepted *Salix lasiolepis* – *Baccharis pilularis* – *Rubus ursinus* Provisional Association from Marin Co. (Evens and Kentner 2006).

References: Buck-Diaz et al. 2012, Keeler-Wolf et al. 2003a, Klein et al. 2007, Klein et al. 2015

Global Rarity Rank: G4

State Rarity Rank: S4?

State Rare: N

Surveys Used for Description

Total: N=21; San Mateo County (n=21): GGNRA316, GGNRA342, GGNRA379, PGA12798, PGA1757, PGA1772, PGA1777, PGA1780, PGA1783, PGA712, PGA733, PGA734, PGA765, PGA766, PWAWF02A, PWAWF03A, SMAT0013, SMAT0200, TOKA104, WRBL043, WRBL044

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Rubus ursinus</i>	100.0	15.6	18.1	0.2	63				Y
	<i>Salix lasiolepis</i>	95.5	63.0	63.2	35	95		Y		Y
	<i>Toxicodendron diversilobum</i>	72.7	7.5	8.8	0.2	45				Y
	<i>Baccharis pilularis</i>	36.4	2.8	1.6	1	12				
	<i>Cornus sericea</i>	22.7	1.3	1.2	0.2	10				
	<i>Rubus parviflorus</i>	22.7	0.7	0.7	0.2	5				
	<i>Frangula californica</i>	22.7	0.4	0.4	0.2	4				
	Herb	<i>Scrophularia californica</i>	40.9	3.4	0.2	0.2	1			
<i>Polystichum munitum</i>		36.4	9.3	1.3	0.2	10				
<i>Stachys ajugoides</i>		36.4	5.8	0.2	0.2	2				
<i>Urtica dioica</i>		27.3	12.8	3.3	1	30				
<i>Clinopodium douglasii</i>		27.3	9.7	0.1	0.2	1				
<i>Conium maculatum</i>		27.3	2.1	0.5	0.2	8				
<i>Heracleum maximum</i>		22.7	1.8	0.2	0.2	2				
<i>Avena</i> spp.		22.7	0.5	0.1	0.2	0.769				

Salix lasiolepis – *Rubus* spp. Association
Salix lasiolepis Shrubland Alliance

***Salix lasiolepis* – *Salix lucida* Association**

Common Name: Arroyo Willow – Shining Willow Shrubland

Alliance: *Salix lasiolepis* Shrubland Alliance

Local Vegetation Description

The Arroyo Willow – Shining Willow Association forms an absent shrub layer. The emergent tree layer is sparse, and the herbaceous layer is open. The dominant shrub is *Salix lasiolepis*. *Salix lasiandra* (= *S. lucida*) is subdominant at a similar level in the canopy. Other characteristic shrubs include *Rubus ursinus* and *Toxicodendron diversilobum*. Commonly associated emergent trees at sparse cover include *Umbellularia californica*. The herbaceous layer typically includes *Pteridium aquilinum*, and herbs that are often present include *Carex obnupta* and *Heracleum maximum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.1	0 – 0.2	12.5	10 – 15
Hardwood	5.1	0.2 – 10	3.5	2 – 5
Regenerating or Shrubby Tree	5.0	0 – 10	3.5	2 – 5
Shrub	57.5	45 – 70	3.5	2 – 5
Herb	12.5	5 – 20	0.9	0 – 2

Local Environmental Description

Elevation: Mean 123 m, Range 98 – 147 m

Aspect: Flat (1)

Slope: 0 degrees (1)

Macro Topography: Bottom (1)

Large Rock: 0%

Small Rock: 0.2%

Fines Cover: 3%

Litter Cover: 93%

Soil Texture (field assessed): Moderately fine silty clay loam (1)

Geology (field or map data): Franciscan melange (1), Mixed alluvium (1)

San Mateo County Watersheds: Pescadero Creek (1), San Mateo Bayside (1)

Site Impacts

This association has very low non-native plant cover (average 0.4%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Erechtites minimus*, *Myosotis latifolia*, and *Sonchus asper*.

Classification Comments

None.

Salix lasiolepis – *Salix lucida* Association
Salix lasiolepis Shrubland Alliance

References: Keeler-Wolf et al. 2003a, Stillwater Sciences and URS 2007

Global Rarity Rank: G3

State Rarity Rank: S3?

State Rare: Y

Surveys Used for Description

Total: N=2; San Mateo County (n=2): PGA1817, SMAT0276

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Umbellularia californica</i>	100.0	49.0	5.0	5	5			Y	Y
	<i>Salix lasiandra</i>	100.0	49.0	5.0	5	5			Y	Y
	<i>Quercus agrifolia</i>	100.0	2.0	0.2	0.2	0.2				Y
Shrub	<i>Salix lasiolepis</i>	100.0	70.8	50.0	50	50		Y		Y
	<i>Cornus sericea</i>	100.0	28.3	20.0	20	20				Y
	<i>Rubus ursinus</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Lonicera involucrata</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Toxicodendron diversilobum</i>	100.0	0.3	0.2	0.2	0.2				Y
	Herb	<i>Heracleum maximum</i>	100.0	48.4	3.0	3	3			Y
<i>Pteridium aquilinum</i>		100.0	16.1	1.0	1	1				Y
<i>Forb (herbaceous, not grass nor grasslike)</i>		100.0	16.1	1.0	1	1				Y
<i>Stachys ajugoides</i>		100.0	3.2	0.2	0.2	0.2				Y
<i>Scrophularia californica</i>		100.0	3.2	0.2	0.2	0.2				Y
<i>Urtica dioica</i>		100.0	3.2	0.2	0.2	0.2				Y
<i>Maianthemum spp.</i>		100.0	3.2	0.2	0.2	0.2				Y
<i>Actaea rubra</i>		100.0	3.2	0.2	0.2	0.2				Y
<i>Carex spp.</i>		100.0	3.2	0.2	0.2	0.2				Y

***Toxicodendron diversilobum* Shrubland Alliance**



Common Name: Poison oak scrub

NVC Alliance Code: A2610. *Toxicodendron diversilobum* Scrub Alliance

Statewide Description

Toxicodendron diversilobum is dominant in the shrub canopy with *Artemisia californica*, *Baccharis pilularis*, *Diplacus aurantiacus*, *Heteromeles arbutifolia*, *Keckiella cordifolia*, *Malosma laurina*, *Philadelphus lewisii*, *Rhamnus ilicifolia*, *Rubus parviflorus*, *Salvia leucophylla*, *Salvia mellifera*, and *Sambucus nigra*. Emergent trees may be present at low cover, including *Juglans californica* or *Quercus agrifolia*.

Sampling in this alliance requires care. Nonetheless, people have sampled it in a variety of settings in southern and central California, from the immediate coastline to dry inland foothills of the Sierra Nevada. Some coastal stands are nearly pure, persistent, and have relatively low diversity. However, some stands are likely to be a consequence of past and frequent fire disturbance, and these can have a high diversity of native herbs and emergent trees. *Toxicodendron diversilobum* grows throughout cismontane California and is found in many low-elevation alliances.

Local Vegetation Description

The Poison oak scrub Alliance forms an open to continuous shrub layer. The emergent tree layer is typically sparse to open, and the herbaceous layer is sparse to continuous. Dominant and characteristic shrubs include *Toxicodendron diversilobum*, *Baccharis*

pilularis, and *Rubus ursinus*. Herbs that are sometimes present include *Carduus pycnocephalus*, *Clinopodium douglasii*, *Conium maculatum*, *Dryopteris arguta*, *Eriophyllum stoechadifolium*, *Heracleum maximum*, *Marah fabaceus*, *Sanicula crassicaulis*, *Scrophularia californica*, and *Urtica dioica*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	1.3	0 – 15	no data	no data
Hardwood	1.8	0 – 10	6.5	2 – 15
Regenerating or Shrubby Tree	0.0	0.0 – 0.2	3.5	2 – 5
Shrub	78.1	19 – 100	2.5	0 – 5
Herb	14.8	0 – 85	1.0	0 – 5

Local Membership Rule

Toxicodendron diversilobum dominates, sometimes intermixing with sub-dominant *Baccharis pilularis* and *Rubus* spp. If *B. pilularis* is present and greater than 50% relative cover, key to the *Baccharis pilularis* Alliance. For this project, stands were encountered close to the coast, although they are likely to occur inland as well.

Local Environmental Description

Elevation: Mean 222 m, Range 11 – 548 m

Aspect: SW (5), NE (5), SE (2)

Slope: Mean 19 degrees, Range 3 – 40 degrees

Macro Topography: Upper 1/3 of slope (3), Upper 1/3 of slope to Ridgetop (2), Lower 1/3 of slope (2), Middle 1/3 of slope (1), Middle to Upper 1/3 of slope (1), Lower to Upper 1/3 of slope (1), Bench (1), Terrace (former shoreline or floodplain) (1)

Large Rock: Mean 1.7%, Range 0.0 – 19.0%

Small Rock: Mean 4.0%, Range 0.0 – 22.0%

Fines Cover: Mean 32.9%, Range 4 – 61.7%

Litter Cover: Mean 41.5%, Range 0.0 – 90%

Soil Texture (field assessed): Medium to very fine, sandy loam (2), Not recorded (2), Moderately coarse, sandy loam (2), Loam, (class unknown) (1), Coarse, loamy sand (1), Moderately fine clay loam (1), Sand, (class unknown) (1), Unknown (1), Medium silt loam (1)

Geology (field or map data): Sandstone and other sedimentary (9), Franciscan melange (6), Volcanic and metavolcanic rocks (3), Sandstone, shale, and conglomerate (2), Sandstone (2), Granitic (2), Metamorphic (type unknown) (1), Greenstone (1), Granitic (generic) (1), Mixed metamorphic (1)

San Mateo County Watersheds: San Mateo Bayside (8), San Francisco Coastal (5), Pacifica (4), Half Moon Bay (3), Palo Alto (3), Pescadero Creek (3), Ano Nuevo (2)

Site Impacts

This alliance has low non-native plant cover (average 11.3%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Carduus pycnocephalus* and *Conium maculatum*.

Associations in San Mateo County

- *Toxicodendron diversilobum* – (*Baccharis pilularis*)

Classification Comments

None.

References: Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: G4 **State Rarity Rank:** S4

Surveys Used for Description

Total: N=29; San Mateo County (n=29): GGNRA325, GGNRA353, GGNRA370, GGNRA375, PGA1004, PGA1028, PGA1035, PGA11630, PGA11969, PGA1761, PGA1770, PGA1823, PGA706, PGA766C, PGA900, PGA908, PGA918, PGA972, PGA986, SCLAR125, SCLAR153, SMAT0026, SMAT0220, SMAT0331, TOKA089, TOKA154, WRBL001, WRBL068, WRBL109

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Toxicodendron diversilobum</i>	100.0	56.3	46.9	15	88	Y	Y		Y
	<i>Baccharis pilularis</i>	89.7	10.8	9.9	0.2	35	Y			Y
	<i>Rubus ursinus</i>	82.8	9.7	8.8	0.2	37	Y			Y
	<i>Frangula californica</i>	31.0	3.1	2.8	0.9	20				
	<i>Artemisia californica</i>	24.1	2.2	1.3	0.2	15				
	<i>Rubus parviflorus</i>	20.7	3.4	3.2	0.2	35				
	<i>Ceanothus thyrsiflorus</i>	20.7	1.9	2.1	1	35				
	Herb	<i>Scrophularia californica</i>	44.8	10.3	1.4	0.2	17			
<i>Marah fabaceus</i>		34.5	5.0	0.5	0.2	3.2				
<i>Urtica dioica</i>		31.0	8.9	1.5	0.2	17				
<i>Clinopodium douglasii</i>		31.0	8.1	0.5	0.2	10				
<i>Heracleum maximum</i>		31.0	4.0	0.2	0.2	3				
<i>Sanicula crassicaulis</i>		31.0	2.4	0.2	0.2	2				
<i>Carduus pycnocephalus</i>		24.1	5.3	3.7	0.2	73				
<i>Conium maculatum</i>		24.1	7.0	1.5	0.2	24.21				1
<i>Eriophyllum stoechadifolium</i>		20.7	4.6	0.6	0.2	6.6				
		<i>Toxicodendron diversilobum</i>								

Toxicodendron diversilobum Shrubland Alliance

Dryopteris arguta 20.7 2.9 0.1 0.2 1

***Toxicodendron diversilobum* – (*Baccharis pilularis*) Association**

Common Name: Poison-oak – (Coyote Brush) Shrubland

Alliance: *Toxicodendron diversilobum* Shrubland Alliance

Classification Comments

This association has been revised to include the previously accepted *Toxicodendron diversilobum* – *Baccharis pilularis* – *Rubus parviflorus* Association from Point Reyes (Keeler-Wolf et al. 2003a). The association circumscription is the same as that of the alliance for the county. See above for detailed description.

References: Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: N

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Toxicodendron diversilobum</i>	100.0	56.3	46.9	15	88		Y		Y
	<i>Baccharis pilularis</i>	89.7	10.8	9.9	0.2	35				Y
	<i>Rubus ursinus</i>	82.8	9.7	8.8	0.2	37				Y
	<i>Frangula californica</i>	31.0	3.1	2.8	0.9	20				
	<i>Artemisia californica</i>	24.1	2.2	1.3	0.2	15				
	<i>Rubus parviflorus</i>	20.7	3.4	3.2	0.2	35				
	<i>Ceanothus thyrsiflorus</i>	20.7	1.9	2.1	1	35				
	Herb	<i>Scrophularia californica</i>	44.8	10.3	1.4	0.2	17			
<i>Marah fabaceus</i>		34.5	5.0	0.5	0.2	3.2				
<i>Urtica dioica</i>		31.0	8.9	1.5	0.2	17				
<i>Clinopodium douglasii</i>		31.0	8.1	0.5	0.2	10				
<i>Heracleum maximum</i>		31.0	4.0	0.2	0.2	3				
<i>Sanicula crassicaulis</i>		31.0	2.4	0.2	0.2	2				
<i>Conium maculatum</i>		24.1	7.0	1.5	0.2	24.21 1				
<i>Carduus pycnocephalus</i>		24.1	5.3	3.7	0.2	73				
<i>Eriophyllum stoechadifolium</i>		20.7	4.6	0.6	0.2	6.6				
<i>Dryopteris arguta</i>		20.7	2.9	0.1	0.2	1				

HERBACEOUS VEGETATION

Abronia latifolia – *Ambrosia chamissonis* Herbaceous Alliance



Common Name: Dune mat

NVC Alliance Code: A1614. *Abronia latifolia* - *Ambrosia chamissonis* Dune Grassland Alliance

Statewide Description

Abronia latifolia and/or *Ambrosia chamissonis* mix with other perennial herbs, grasses, and low shrubs to form a low canopy with *Abronia maritima*, *Abronia umbellata*, *Achillea millefolium*, *Artemisia pycnocephala*, *Atriplex* spp., *Cakile maritima*, *Calystegia macrostegia*, *Calystegia soldanella*, *Camissonia cheiranthifolia*, *Cardionema ramosissimum*, *Carpobrotus* spp., *Croton californicus*, *Erigeron glaucus*, *Eriogonum latifolium*, *Eriogonum parvifolium*, *Eriophyllum staechadifolium*, *Erysimum* spp., *Fragaria chiloensis*, *Grindelia stricta*, *Lathyrus littoralis*, *Malacothrix incana*, and *Poa douglasii*. Emergent shrubs may be present at low cover, including *Baccharis pilularis*, *Ericameria ericoides*, *Lupinus arboreus*, or *Lupinus chamissonis*.

Plants of the Dune Mat are well adapted to shifts both temporally and spatially as a result of variable environmental conditions. In some areas, local mound-by-mound dominance of *Abronia latifolia*, *Ambrosia chamissonis*, *Poa douglasii*, and other species suggests fine-scale microsite patterning; however, the scale of disturbance and the

clonal mat-forming characteristics of many of the major species suggest that stands should be considered on a larger spatial scale. For these reasons, this alliance is presented broadly and variation is described at the association level.

Local Vegetation Description

The Dune mat Alliance forms an open to continuous herbaceous layer. The shrub layer is sparse to absent and the tree layer is absent. Characteristic herbs include *Ambrosia chamissonis* and *Cakile maritima*. Those herbs often present include *Abronia latifolia*, *Artemisia pycnocephala*, *Calystegia soldanella*, *Carpobrotus edulis*, and *Distichlis spicata*, and herbs that are sometimes present include *Ammophila arenaria*, *Bromus diandrus*, *Camissonia cheiranthifolia*, *Heliotropium curassavicum*, *Lathyrus littoralis*, *Pseudognaphalium stramineum*, *Senecio* spp., *Sonchus oleraceus*, *Tanacetum camphoratum*, and *Tetragonia tetragonioides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0.0 – 0.0	no data	no data
Shrub	0.0	0.0 – 0.0	no data	no data
Herb	40.0	5 – 75	0.3	0 – 0.5

Local Membership Rule

Abronia latifolia and/or *Ambrosia chamissonis* are characteristically present to dominant, sometimes with *Armeria maritima*, *Calystegia soldanella*, *Camissonia cheiranthifolia*, *Cardionema ramosissimum*, *Poa douglasii*, or *Polygonum paronychia* occurring as associated species. Non-native species such as *Cakile maritima*, *Carpobrotus* spp., and *Ammophila arenaria* may also be present.

Local Environmental Description

Elevation: Mean 14 m, Range 7 – 28 m

Aspect: SW (2), Variable (1), SE (1)

Slope: Mean 7 degrees, Range 1 – 15 degrees

Macro Topography: Lower 1/3 of slope (2), Upper 1/3 of slope to Ridgetop (1), Bottom to Lower 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 91.0%, Range 78 – 98%

Litter Cover: Mean 6.8%, Range 1.0 – 20%

Soil Texture (field assessed): Sand, (class unknown) (2), Medium sand (1), Fine sand (1)

Geology (field or map data): Sand dunes (2), Sandstone (1), Sandstone and other sedimentary (1)

San Mateo County Watersheds: Ano Nuevo (2), Pescadero Creek (1), San Francisco Coastal (1)

Abronia latifolia – *Ambrosia chamissonis* Herbaceous Alliance

Other Watersheds, San Francisco Co.: San Francisco Coastal (1)

Site Impacts

This alliance has low non-native plant cover (average 11.6%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Ammophila arenaria*, *Bromus diandrus*, *Cakile maritima*, *Carpobrotus edulis*, *Sonchus oleraceus*, and *Tetragonia tetragonioides*.

Associations in San Mateo County

- *Abronia latifolia* – *Calystegia soldanella* – *Lathyrus littoralis*
- *Ambrosia chamissonis*

Classification Comments

None.

References: Biondi and Casavecchia 2001, Bluestone 1981, Buck-Diaz et al. 2020, Klein et al. 2015

Global Rarity Rank: G3

State Rarity Rank: S3

Surveys Used for Description

Total: N=4; San Mateo County (n=3): SMAT0327, SMAT0659, WRBL115

San Francisco County (n=1): SMAT0227

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Ambrosia chamissonis</i>	100.0	15.6	2.7	0.2	10	Y			Y
	<i>Cakile maritima</i>	100.0	6.9	0.9	0.2	2	Y			Y
	<i>Calystegia soldanella</i>	50.0	17.9	6.8	2	25				Y
	<i>Carpobrotus edulis</i>	50.0	2.4	1.5	1	5				Y
	<i>Abronia latifolia</i>	50.0	8.8	1.3	2	3				Y
	<i>Distichlis spicata</i>	50.0	5.2	0.8	0.2	3				Y
	<i>Artemisia pycnocephala</i>	50.0	4.6	0.8	1	2				Y
	<i>Tanacetum camphoratum</i>	25.0	24.2	18.8	75	75				
	<i>Lathyrus littoralis</i>	25.0	10.3	6.3	25	25				
	<i>Tetragonia tetragonioides</i>	25.0	1.5	0.3	1	1				
	<i>Heliotropium curassavicum</i>	25.0	1.5	0.3	1	1				
	<i>Senecio spp.</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Sonchus oleraceus</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Pseudognaphalium stramineum</i>	25.0	0.1	0.1	0.2	0.2				

Abronia latifolia – *Ambrosia chamissonis* Herbaceous Alliance

<i>Bromus diandrus</i>	25.0	0.1	0.1	0.2	0.2
<i>Ammophila arenaria</i>	25.0	0.8	0.1	0.2	0.2
<i>Camissonia cheiranthifolia</i>	25.0	0.1	0.1	0.2	0.2

***Abronia latifolia* – *Calystegia soldanella* – *Lathyrus littoralis* Association**

Common Name: Coastal Sand-Verbena – Beach Morning Glory – Beach Pea Patches

Alliance: *Abronia latifolia* – *Ambrosia chamissonis* Herbaceous Alliance

Local Vegetation Description

The Coastal Sand-Verbena – Beach Morning Glory – Beach Pea Association forms an open to intermittent herbaceous layer. The shrub layer is sparse and the tree layer is absent. Characteristic herbs include *Abronia latifolia*, *Ambrosia chamissonis*, *Artemisia pycnocephala*, and *Calystegia soldanella*.

Those herbs often present include *Cakile maritima*, *Carpobrotus edulis*, *Lathyrus littoralis*, and *Poa douglasii*, and herbs that are sometimes present include *Camissonia cheiranthifolia*, *Erysimum concinnum*, *Lupinus tidestromii*, and *Monardella undulata*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	1.8	0.0 – 8.0	0.3	0 – 0.5
Herb	21.8	5 – 60	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 9 m, Range 7 – 13 m

Aspect: Variable (2), SE (2), SW (1)

Slope: Mean 7 degrees, Range 0 – 15 degrees

Macro Topography: Lower 1/3 of slope (3), Bottom to Lower 1/3 of slope (1), Bottom (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 93.6%, Range 78.0 – 99.0%

Litter Cover: Mean 5.2%, Range 0.2 – 20%

Soil Texture (field assessed): Sand, (class unknown) (4), Fine sand (1)

Geology (field or map data): Sandstone (2), Sandstone and other sedimentary (2), Sand dunes (1)

San Mateo County Watersheds: Ano Nuevo (1), Pescadero Creek (1)

Other Watersheds, Marin Co.: Point Reyes (3)

Site Impacts

This association has low non-native plant cover (average 5.9%) relative to native

Abronia latifolia – *Calystegia soldanella* – *Lathyrus littoralis* Association
Abronia latifolia – *Ambrosia chamissonis* Herbaceous Alliance

cover. Non-native species that occur with highest frequency and abundance include *Cakile maritima* and *Carpobrotus edulis*.

Classification Comments

Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Bluestone 1981, Klein et al. 2015

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=5; San Mateo County (n=2): SMAT0327, SMAT0659

Marin County (n=3): MARIN151, MARIN152, MARIN153

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Lupinus chamissonis</i>	40.0	20.5	0.1	0.2	0.2				
Herb	<i>Calystegia soldanella</i>	100.0	23.1	6.6	1	25				Y
	<i>Abronia latifolia</i>	80.0	8.5	1.2	0.2	3				Y
	<i>Artemisia pycnocephala</i>	80.0	6.5	1.0	0.2	2				Y
	<i>Ambrosia chamissonis</i>	80.0	1.2	0.2	0.2	0.2				Y
	<i>Lathyrus littoralis</i>	60.0	27.2	8.2	5	25				Y
	<i>Poa douglasii</i>	60.0	9.8	1.6	0.2	5				Y
	<i>Cakile maritima</i>	60.0	3.3	0.3	0.2	1				Y
	<i>Carpobrotus edulis</i>	60.0	2.1	1.1	0.11	5				Y
	<i>Lupinus tidestromii</i>	40.0	14.9	2.0	3	7				
	<i>Erysimum concinnum</i>	40.0	0.6	0.1	0.2	0.2				
	<i>Monardella undulata</i>	40.0	0.6	0.1	0.2	0.2				
	<i>Camissonia cheiranthifolia</i>	40.0	0.6	0.1	0.2	0.2				

Ambrosia chamissonis Association

Common Name: Beach bursage Patches

Alliance: *Abronia latifolia* – *Ambrosia chamissonis* Herbaceous Alliance

Local Vegetation Description

The Beach bursage Association forms an open to intermittent herbaceous layer. The shrub layer is sparse or absent and the tree layer is absent. Dominant herbs include *Ambrosia chamissonis*, and characteristic herbs include *Cakile maritima*. Those herbs often present include *Abronia latifolia*, *Camissonia cheiranthifolia*, and *Poa douglasii*, and herbs that are sometimes present include *Agoseris apargioides*, *Agoseris grandiflora*, *Calystegia soldanella*, *Carpobrotus edulis*, *Distichlis spicata*, *Heliotropium curassavicum*, *Lathyrus littoralis*, *Lupinus tidedromii*, *Monardella undulata*, *Polygonum paronychia*, *Sonchus asper*, and *Tetragonia tetragonioides*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.3	0.0 – 1.0	0.3	0 – 0.5
Herb	37.3	20 – 70	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 16 m, Range 9 – 30 m

Aspect: NW (1), SE (1), SW (1), Variable (1)

Slope: Mean 8 degrees, Range 1 – 19 degrees

Macro Topography: Lower 1/3 of slope (3), Bottom to Lower 1/3 of slope (1)

Large Rock: Mean 0.0%, Range 0.0 – 0.0%

Small Rock: Mean 0.0%, Range 0.0 – 0.0%

Fines Cover: Mean 98.0%, Range 97.0 – 99.0%

Litter Cover: Mean 2.1%, Range 0.2 – 5%

Soil Texture (field assessed): Sand, (class unknown) (4)

Geology (field or map data): Sandstone (2), Marine and nonmarine sand deposits (1), Sandstone and other sedimentary (1)

San Mateo County Watersheds: Ano Nuevo (1)

Other Watersheds, Marin Co.: Point Reyes (3)

Site Impacts

This association has low non-native plant cover (average 4.9%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Cakile maritima*, *Carpobrotus edulis*, *Sonchus asper*, and *Tetragonia tetragonioides*.

Ambrosia chamissonis Association
Abronia latifolia – *Ambrosia chamissonis* Herbaceous Alliance

Classification Comments

Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Buck-Diaz et al. 2020, Klein et al. 2015

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=4; San Mateo County (n=1): WRBL115

Marin County (n=3): MARIN081, MARIN138, MARIN154

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Ericameria ericoides</i>	25.0	25.0	0.3	1	1				
Herb	<i>Ambrosia chamissonis</i>	100.0	82.9	33.3	10	70		Y		Y
	<i>Cakile maritima</i>	75.0	3.2	0.6	0.2	2				Y
	<i>Poa douglasii</i>	50.0	2.7	0.8	1	2				Y
	<i>Abronia latifolia</i>	50.0	0.3	0.1	0.2	0.2				Y
	<i>Camissonia cheiranthifolia</i>	50.0	0.3	0.1	0.2	0.2				Y
	<i>Distichlis spicata</i>	25.0	4.4	0.8	3	3				
	<i>Tetragonia tetragonioides</i>	25.0	1.5	0.3	1	1				
	<i>Heliotropium curassavicum</i>	25.0	1.5	0.3	1	1				
	<i>Calystegia soldanella</i>	25.0	1.0	0.3	1	1				
	<i>Lupinus tidestromii</i>	25.0	1.0	0.3	1	1				
	<i>Monardella undulata</i>	25.0	0.2	0.1	0.2	0.2				
	<i>Agoseris grandiflora</i>	25.0	0.2	0.1	0.2	0.2				
	<i>Lathyrus littoralis</i>	25.0	0.2	0.1	0.2	0.2				
	<i>Sonchus asper</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Carpobrotus edulis</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Agoseris apargioides</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Polygonum paronychia</i>	25.0	0.1	0.1	0.2	0.2				

***Ammophila arenaria* Herbaceous Semi-Natural Alliance**



Common Name: European beach grass swards

NVC Alliance Code: A2061. *Ammophila arenaria* Coastal Dunegrass Ruderal Grassland Alliance

Statewide Description

Ammophila arenaria is dominant in the herbaceous layer. Emergent shrubs may be present at low cover, including *Baccharis pilularis* or *Lupinus arboreus*.

Ammophila arenaria is now the predominant vegetation type in many dune systems along the Pacific coast from Ventura County to British Columbia. Many habitat changes occur with its presence: dune stabilization, alteration of dune morphology, reduction in native stands of the *Abronia latifolia* – *Ambrosia chamissonis*, *Leymus mollis*, and other alliances, and a reduction in habitat for both rare animals (e.g., snowy plover, *Charadrius alexandrinus*) and rare plants (e.g., *Erysimum menziesii* ssp. *eurekaense* and *Layia carnosus*, both listed as California rare plants with a rank of 1B.1).

Local Vegetation Description

The European beach grass swards Alliance forms an intermittent to continuous herbaceous layer. The shrub layer is open and the tree layer is sparse or absent. Dominant herbs include *Ammophila arenaria*. Those herbs often present include *Carpobrotus edulis*, and herbs that are sometimes present include *Achillea millefolium*, *Camissonia cheiranthifolia*, *Galium aparine*, *Hypochaeris radicata*, *Pseudognaphalium*

Ammophila arenaria Herbaceous Semi-Natural Alliance

spp., *Pterostegia drymarioides*, and *Sonchus asper*. Commonly associated emergent shrubs at low cover include *Baccharis pilularis* and *Lupinus arboreus*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0.2	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	9.7	5 – 15	0.8	0 – 2
Herb	74.7	45 – 90	0.9	0 – 2

Local Membership Rule

Ammophila arenaria is strongly dominant in the herbaceous layer.

Local Environmental Description

Elevation: Mean 21 m, Range 11 – 31 m

Aspect: Variable (2), NW (1)

Slope: Mean 11 degrees, Range 4 – 18 degrees

Macro Topography: Bottom to Lower 1/3 of slope (1), Dune/sandfield (1), Lower 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 50.0%, Range 30.0 – 70.0%

Litter Cover: Mean 46.7%, Range 30.0 – 70%

Soil Texture (field assessed): Sand, (class unknown) (3)

Geology (field or map data): Sand dunes (3), Marine and nonmarine sand deposits (2), Sandstone and other sedimentary (1)

San Mateo County Watersheds: Ano Nuevo (1), Pescadero Creek (1)

Other Watersheds, Marin Co.: Point Reyes (3)

Site Impacts

This alliance has greater cover of exotics than natives, non-native plant cover (average 82.9%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Ammophila arenaria*, *Carpobrotus edulis*, *Hypochaeris radicata*, and *Sonchus asper*.

Associations in San Mateo County

- *Ammophila arenaria*

Classification Comments

Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: Buck-Diaz et al. 2020, Duebendorfer 1989, Klein et al. 2015, LaBanca 1993

Global Rarity Rank: GNA

State Rarity Rank: SNA

Surveys Used for Description

Total: N=8; San Mateo County (n=2): SMAT0047, SMAT0139

Marin County (n=6): PGA1102, PGA179, PGA204, PGA396, PGA477, PORE110

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	87.5	62.7	5.7	0.2	10	Y	Y		Y
	<i>Lupinus arboreus</i>	75.0	30.1	2.6	0.2	9	Y		Y	Y
Herb	<i>Ammophila arenaria</i>	100.0	87.1	59.7	25	87.5	Y	Y		Y
	<i>Carpobrotus edulis</i>	50.0	3.3	2.7	0.2	16				Y
	<i>Hypochaeris radicata</i>	37.5	0.1	0.1	0.2	0.2				
	<i>Achillea millefolium</i>	25.0	2.7	1.9	0.2	15				
	<i>Pterostegia drymarioides</i>	25.0	0.3	0.2	0.2	1				
	<i>Sonchus asper</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Camissonia cheiranthifolia</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Galium aparine</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Pseudognaphalium spp.</i>	25.0	0.1	0.1	0.2	0.2				

***Ammophila arenaria* Semi-natural Association**

Common Name: Beachgrass Patches

Alliance: *Ammophila arenaria* Herbaceous Semi-Natural Alliance

Local Vegetation Description

The Beachgrass Association forms an intermittent herbaceous layer. The shrub layer is open and the tree layer is usually absent. Dominant herbs include *Ammophila arenaria*. Those herbs often present include *Carpobrotus edulis*, and herbs that are sometimes present include *Achillea millefolium*, *Camissonia cheiranthifolia*, *Galium aparine*, *Hypochaeris radicata*, *Pseudognaphalium*, *Pterostegia drymarioides*, and *Sonchus asper*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis* and *Lupinus arboreus*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.1	0 – 0.2	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	10.0	5.0 – 15.0	0.5	0 – 1
Herb	52.5	45 – 60	0.5	0 – 1

Local Environmental Description

Elevation: Mean 18 m, Range 11 – 25 m

Aspect: Variable (2)

Slope: Mean 15 degrees, Range 12 – 18 degrees

Macro Topography: Bottom to Lower 1/3 of slope (1), Lower 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 50.0%, Range 30.0 – 70.0%

Litter Cover: Mean 50.0%, Range 30.0 – 70%

Soil Texture (field assessed): Sand, (class unknown) (2)

Geology (field or map data): Sand dunes (2)

San Mateo County Watersheds: Ano Nuevo (1), Pescadero Creek (1)

Site Impacts

This association has greater cover of exotics (average 81.5%) than natives. Non-native species that occur with highest frequency and abundance include *Ammophila arenaria*, *Carpobrotus edulis*, *Hypochaeris radicata*, and *Sonchus asper*.

Classification Comments

None.

References: Buck-Diaz et al. 2020, Duebendorfer 1989, Klein et al. 2015, LaBanca 1993

Global Rarity Rank: GNA

State Rarity Rank: SNA

State Rare: N

Surveys Used for Description

Total: N=2; San Mateo County (n=2): SMAT0047, SMAT0139

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Hesperocyparis macrocarpa</i>	50.0	50.0	0.1	0.2	0.2				Y
Shrub	<i>Baccharis pilularis</i>	100.0	66.4	5.0	5	5		Y		Y
	<i>Toxicodendron diversilobum</i>	50.0	16.4	2.5	5	5				Y
	<i>Lupinus arboreus</i>	50.0	9.9	1.5	3	3				Y
	<i>Frangula californica</i>	50.0	6.6	1.0	2	2				Y
	<i>Lonicera hispidula</i>	50.0	0.7	0.1	0.2	0.2				Y
Herb	<i>Ammophila arenaria</i>	100.0	92.9	47.5	45	50		Y		Y
	<i>Pterostegia drymarioides</i>	100.0	1.1	0.6	0.2	1				Y
	<i>Sonchus asper</i>	100.0	0.4	0.2	0.2	0.2				Y
	<i>Pseudognaphalium spp.</i>	100.0	0.4	0.2	0.2	0.2				Y
	<i>Galium aparine</i>	100.0	0.4	0.2	0.2	0.2				Y
	<i>Hypochaeris radicata</i>	100.0	0.4	0.2	0.2	0.2				Y
	<i>Carpobrotus edulis</i>	50.0	2.0	1.0	2	2				Y
	<i>Brassica spp.</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Achillea millefolium</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Medicago spp.</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Logfia gallica</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Artemisia pycnocephala</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Camissonia cheiranthifolia</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Eriogonum latifolium</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Bromus catharticus</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Cryptantha leiocarpa</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Anagallis arvensis</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Juncus spp.</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Bromus diandrus</i>	50.0	0.2	0.1	0.2	0.2				Y

Ammophila arenaria Semi-natural Association
Ammophila arenaria Herbaceous Semi-Natural Alliance

***Atriplex prostrata* – *Cotula coronopifolia* Herbaceous Semi-Natural Alliance**



Common Name: Fields of fat hen and brass buttons

NVC Alliance Code: N/A.

Statewide Description

Atriplex prostrata and/or *Cotula coronopifolia* is dominant or co-dominant in the herbaceous layer.

Both species are indicative of disturbed conditions in alkaline or saline wetlands. Both are early seral plants; they may be abundant to sparse from year to year depending on disturbance regime and salinity. Thus, we place them into this one vegetation type which constitutes an ephemeral, seasonally flooded marsh type at intermediate tidal elevations with relatively high salinities (Keeler-Wolf and Vaghti 2000, Pickart 2006). Stands occur usually in relatively narrow bands along the upper margins of brackish or salt marshes, and sometimes as extensive monocultures (Pickart 2006). Ecologically, the most closely related native types may be the *Distichlis spicata* and *Frankenia salina* alliances. As a result of flooding, stands of the *Typha* (*angustifolia*, *domingensis*, *latifolia*) alliance and other freshwater plants may occur adjacent to or replace them.

Local Vegetation Description

The Fields of fat hen and brass buttons Alliance forms an open herbaceous layer in the single survey available. The shrub layer is absent and the tree layer is absent.

Atriplex prostrata – *Cotula coronopifolia* Herbaceous Semi-Natural
Alliance

Dominant herbs include *Atriplex prostrata*, and characteristic herbs include *Bolboschoenus maritimus* and *Sarcocornia pacifica*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	NA	no data	no data
Hardwood	0.0	NA	no data	no data
Regenerating or Shrubby Tree	0.0	NA	no data	no data
Shrub	0.0	NA	no data	no data
Herb	32.0	NA	0.3	0 – 0.5

Local Membership Rule

Non-native species such as *Cotula coronopifolia* and/or *Atriplex prostrata* dominate in low-lying sloughs and other disturbed alkaline or saline wetlands

Local Environmental Description

Elevation: 9 m

Aspect: Flat (1)

Slope: 0 degrees

Macro Topography: Bottom (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: 16.0%

Litter Cover: 78%

Soil Texture (field assessed): Muck (1)

Geology (field or map data): Mixed alluvium (1)

San Mateo County Watersheds: Ano Nuevo (1)

Site Impacts

This alliance has greater cover of exotics than natives, non-native plant cover (average 93.2%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Atriplex prostrata*.

Associations in San Mateo County

- *Atriplex prostrata*

Classification Comments

None.

References: Keeler-Wolf and Vaghti 2000, Pickart 2006

Global Rarity Rank: GNA **State Rarity Rank:** SNA

Surveys Used for Description

Atriplex prostrata – *Cotula coronopifolia* Herbaceous Semi-Natural
Alliance

Total: N=1; San Mateo County (n=1): SMAT0299

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Atriplex prostrata</i>	100.0	93.2	30.0	30	30	Y	Y		Y
	<i>Sarcocornia pacifica</i>	100.0	6.2	2.0	2	2	Y			Y
	<i>Bolboschoenus</i>	100.0	0.6	0.2	0.2	0.2	Y			Y
	<i>maritimus</i>									

***Atriplex prostrata* Semi-natural Association**

Common Name: Fat Hen Fields Patches

Alliance: *Atriplex prostrata* – *Cotula coronopifolia* Herbaceous Semi-Natural Alliance

Classification Comments

The association circumscription is the same as that of the alliance for the county. See above for detailed description.

References: Keeler-Wolf and Vaghti 2000

Global Rarity Rank: GNA

State Rarity Rank: SNA

State Rare: N

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Atriplex prostrata</i>	100.0	93.2	30.0	30	30		Y		Y
	<i>Sarcocornia pacifica</i>	100.0	6.2	2.0	2	2				Y
	<i>Bolboschoenus</i>	100.0	0.6	0.2	0.2	0.2				Y
	<i>maritimus</i>									

***Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance**



Common Name: Wild oats and annual brome grasslands

NVC Alliance Code: A3870. *Avena fatua* - *Bromus* spp. Ruderal Annual Grassland Alliance

Statewide Description

Avena barbata, *Avena fatua*, *Brachypodium distachyon*, *Bromus diandrus*, and/or *Bromus hordeaceus* dominate or co-dominate in the herbaceous layer. Emergent trees and shrubs may be present at low cover.

Until recently, this type was recognized as two separate alliances. However, the yearly shift of species dominance and the overlap of many non-native *Bromus* and *Avena* species suggests a broader, more inclusive treatment. This alliance is identified by high, persistent cover of non-native grasses, but may have high cover of early spring non-native herbs such as *Erodium* spp. as well.

Local Vegetation Description

The Wild oats and annual brome grasslands Alliance forms an open to continuous herbaceous layer. The shrub layer is open and the tree layer is absent. Characteristic herbs include *Bromus diandrus* and *Bromus hordeaceus*. Those herbs often present include *Avena* spp., *Brachypodium distachyon*, *Carduus pycnocephalus*, *Geranium dissectum*, *Hypochaeris radicata*, *Linum bienne*, *Lolium perenne*, *Nassella pulchra*, *Picris echioides*, *Plantago lanceolata*, *Rumex acetosella*, *Sisyrinchium bellum*, *Vicia*

sativa, and *Vulpia bromoides*, and herbs that are sometimes present include *Achillea millefolium*, *Aira caryophylla*, *Anagallis arvensis*, *Briza minor*, *Bromus carinatus*, *Centaurea melitensis*, *Centaurea solstitialis*, *Chlorogalum pomeridianum*, *Conium maculatum*, *Cynosurus echinatus*, *Danthonia californica*, *Eschscholzia californica*, *Holcus lanatus*, *Hypochaeris glabra*, *Lotus corniculatus*, *Lupinus bicolor*, *Medicago* spp., *Myosotis discolor*, *Raphanus sativus*, *Sanicula bipinnatifida*, *Sherardia arvensis*, *Sidalcea malviflora*, *Silene gallica*, *Trifolium angustifolium*, *Trifolium hirtum*, and *Vicia tetrasperma*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	3.5	0 – 7	no data	no data
Herb	65.3	15 – 96	0.3	0 – 0.5

Local Membership Rule

Avena, *Brachypodium*, *Briza*, *Bromus*, *Erodium* and/or *Hypochaeris* dominate individually or in combination. If *Elymus caput-medusae* is co-dominant with *Avena* and/or *Bromus* spp., those stands can also key here. If *Lolium perenne* is co-dominant key to that alliance.

Local Environmental Description

Elevation: Mean 261 m, Range 15 – 730 m

Aspect: SW (3), Flat (1)

Slope: Mean 18 degrees, Range 0 – 32 degrees

Macro Topography: Backslope (cliff) (1), Upper 1/3 of slope (1), Upper 1/3 of slope to Ridgetop (1)

Large Rock: Mean 1.5%, Range 0.0 – 8%

Small Rock: Mean 17.5%, Range 0.0 – 80%

Fines Cover: Mean 30.3%, Range 2.0 – 61.7%

Litter Cover: Mean 45.9%, Range 3.0 – 93%

Soil Texture (field assessed): Moderately fine sandy clay loam (3)

Geology (field or map data): Sandstone (2), Sandstone and other sedimentary (1), Serpentine (1)

San Mateo County Watersheds: Palo Alto (1), Pescadero Creek (1), San Mateo Bayside (1), Tunitas Creek (1)

Site Impacts

This alliance has greater cover of exotics than natives, non-native plant cover (average 80.0%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira caryophylla*, *Anagallis arvensis*, *Brachypodium distachyon*, *Briza minor*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus*

Avena spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance

pycnocephalus, *Centaurea melitensis*, *Centaurea solstitialis*, *Conium maculatum*, *Cynosurus echinatus*, *Geranium dissectum*, *Holcus lanatus*, *Hypochaeris glabra*, *Hypochaeris radicata*, *Linum bienne*, *Lotus corniculatus*, *Myosotis discolor*, *Picris echioides*, *Plantago lanceolata*, *Raphanus sativus*, *Rumex acetosella*, *Sherardia arvensis*, *Silene gallica*, *Trifolium angustifolium*, *Trifolium hirtum*, *Vicia sativa*, *Vicia tetrasperma*, and *Vulpia bromoides*.

Associations in San Mateo County

- *Avena barbata* – *Avena fatua*
- *Brachypodium distachyon*
- *Bromus hordeaceus* – *Erodium botrys*

Classification Comments

None.

References: AECOM 2013, Buck and Evens 2010, Buck-Diaz et al. 2011, Buck-Diaz et al. 2012, Buck- Diaz et al. 2013, Evens and San 2004, Jimerson et al. 2000, Keeler-Wolf and Evens 2006, Keeler- Wolf et al. 2003a, Klein et al. 2015, Parsons and Stohlgren 1989, Rodriguez 2015, Rodriguez et al. 2017, Schlising and Sanders 1982, Solomeshch and Barbour 2006, Sproul et al. 2011, Verdone and Evens 2010

Global Rarity Rank: GNA **State Rarity Rank:** SNA

Surveys Used for Description

Total: N=6; San Mateo County (n=6): GGNRA261, PONU008A, PWVNG03A, SCLAR152, SMAT0004, TOTO084

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	66.7	57.1	3.3	3	7				Y
	<i>Rubus ursinus</i>	33.3	9.5	0.7	2	2				
Herb	<i>Bromus hordeaceus</i>	100.0	9.4	5.7	0.2	18	Y			Y
	<i>Bromus diandrus</i>	83.3	2.4	1.9	0.2	6.8627	Y			Y
	<i>Brachypodium distachyon</i>	66.7	9.6	12.8	0.2	65				Y
	<i>Lolium perenne</i>	66.7	5.5	4.2	2	15.549				Y
	<i>Avena spp.</i>	66.7	8.5	3.1	0.2	10				Y
	<i>Rumex acetosella</i>	66.7	3.1	2.7	0.2	12				Y
	<i>Geranium dissectum</i>	66.7	2.6	2.3	0.2	7.5163				Y
	<i>Carduus pycnocephalus</i>	66.7	3.1	1.1	0.2	3				Y
	<i>unknown Poaceae</i>	50.0	8.6	8.0	8.23	27				Y

Avena spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance

				17		
<i>Vulpia bromoides</i>	50.0	7.0	7.0	0.2	22.222	Y
<i>Plantago lanceolata</i>	50.0	6.5	3.7	0.2	12.195	Y
<i>Linum bienne</i>	50.0	1.6	1.5	0.4	6.5359	Y
<i>Picris echioides</i>	50.0	0.8	1.0	0.2	5	Y
<i>Hypochaeris radicata</i>	50.0	1.4	0.6	0.2	3	Y
<i>Vicia sativa</i>	50.0	0.4	0.4	0.60 98	1	Y
<i>Sisyrinchium bellum</i>	50.0	0.2	0.1	0.2	0.3049	Y
<i>Nassella pulchra</i>	50.0	0.3	0.1	0.2	0.3049	Y
<i>Hypochaeris glabra</i>	33.3	6.1	8.5	1	50	
<i>Vicia tetrasperma</i>	33.3	1.5	1.5	0.30 49	8.8235	
<i>Holcus lanatus</i>	33.3	1.2	1.2	1.82 93	5.2288	
<i>Conium maculatum</i>	33.3	0.8	0.8	0.2	4.5752	
<i>Danthonia californica</i>	33.3	0.8	0.8	0.2	4.5732	
<i>Medicago spp.</i>	33.3	0.4	0.6	0.32 68	3	
<i>Anagallis arvensis</i>	33.3	1.4	0.5	0.2	3	
<i>Trifolium angustifolium</i>	33.3	0.4	0.4	0.2	2.1341	
<i>Aira caryophyllea</i>	33.3	0.4	0.4	0.2	2.1341	
<i>Sherardia arvensis</i>	33.3	0.5	0.4	0.2	2	
<i>Lotus corniculatus</i>	33.3	0.3	0.3	0.2	1.634	
<i>Achillea millefolium</i>	33.3	0.8	0.2	0.2	1	
<i>Centaurea solstitialis</i>	33.3	0.8	0.2	0.2	1	
<i>Myosotis discolor</i>	33.3	0.2	0.2	0.2	0.9804	
<i>Briza minor</i>	33.3	0.2	0.2	0.2	0.9146	
<i>Cynosurus echinatus</i>	33.3	0.1	0.1	0.2	0.6098	
<i>Trifolium hirtum</i>	33.3	0.1	0.1	0.2	0.3049	
<i>Centaurea melitensis</i>	33.3	0.1	0.1	0.2	0.2	
<i>Silene gallica</i>	33.3	0.1	0.1	0.2	0.2	
<i>Sidalcea malviflora</i>	33.3	0.1	0.1	0.2	0.2	
<i>Raphanus sativus</i>	33.3	0.1	0.1	0.2	0.2	
<i>Lupinus bicolor</i>	33.3	0.2	0.1	0.2	0.2	
<i>Chlorogalum pomeridianum</i>	33.3	0.3	0.1	0.2	0.2	
<i>Eschscholzia californica</i>	33.3	0.1	0.1	0.2	0.2	
<i>Bromus carinatus</i>	33.3	0.1	0.1	0.2	0.2	
<i>Sanicula bipinnatifida</i>	33.3	0.1	0.1	0.11	0.2	

***Avena barbata* – *Avena fatua* Semi-natural Association**

Common Name: Wild Oat Ruderal Grassland Patches

Alliance: *Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance

Local Vegetation Description

The Wild Oat Ruderal Grassland Association forms an open to continuous herbaceous layer. The shrub layer is sparse to open and the tree layer is absent. Dominant herbs include *Avena* spp. Those herbs often present include *Bromus diandrus*, *Bromus hordeaceus*, *Erodium botrys*, *Lolium perenne*, and *Nassella pulchra*, and herbs that are sometimes present include *Anagallis arvensis*, *Brachypodium distachyon*, *Briza maxima*, *Carduus pycnocephalus*, *Chlorogalum pomeridianum*, *Cynosurus echinatus*, *Eschscholzia californica*, *Geranium dissectum*, *Hypochaeris glabra*, *Hypochaeris radicata*, *Plantago lanceolata*, *Sherardia arvensis*, *Sidalcea malviflora*, *Silene gallica*, *Trifolium dubium*, *Trifolium hirtum*, *Vicia sativa*, and *Vulpia bromoides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	2.2	0.0 – 8.0	1.5	1 – 2
Herb	72.1	60 – 81	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 319 m, Range 200 – 398 m

Aspect: SW (3), NE (1), S (1)

Slope: Mean 13 degrees, Range 3 – 22 degrees

Macro Topography: Entire slope (1), Lower 1/3 of slope (1), Middle 1/3 of slope (1), Upper 1/3 of slope (1)

Large Rock: Mean 4.0%, Range 0.0 – 8.0%

Small Rock: Mean 9.5%, Range 0.0 – 19.0%

Fines Cover: Mean 9.0%, Range 0.0 – 22.0%

Litter Cover: Mean 14.8%, Range 0.0 – 35%

Soil Texture (field assessed): Fine silty clay (1), Medium to very fine, sandy loam (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Serpentine (3), Diabase (1), Volcanic and metavolcanic rocks (1)

San Mateo County Watersheds: San Mateo Bayside (1)

Other Watersheds, Santa Clara Co.: Coyote Creek (3), Guadalupe River (1)

Site Impacts

This association has greater cover of exotics (average 90.7%) than natives. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Avena* spp., *Brachypodium distachyon*, *Briza maxima*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Cynosurus echinatus*, *Erodium botrys*, *Geranium dissectum*, *Hypochaeris glabra*, *Hypochaeris radicata*, *Lolium perenne*, *Plantago lanceolata*, *Sherardia arvensis*, *Silene gallica*, *Trifolium dubium*, *Trifolium hirtum*, *Vicia sativa*, and *Vulpia bromoides*.

Classification Comments

Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Buck and Evens 2010, Buck-Diaz et al. 2011, Buck-Diaz et al. 2012, Buck-Diaz et al. 2013, Evens and San 2004, Keeler-Wolf and Evens 2006, Klein et al. 2015, Parsons and Stohlgren 1989, Rodriguez 2015, Rodriguez et al. 2017, Sproul et al. 2011, Verdone and Evens 2010

Global Rarity Rank: GNA **State Rarity Rank:** SNA **State Rare:** N

Surveys Used for Description

Total: N=5; San Mateo County (n=1): PWVNG03A

Santa Clara County (n=4): CORT015, COYO014, COYO063, SCLAR097

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	40.0	40.0	2.2	3	8				
Herb	<i>Avena</i> spp.	100.0	61.4	46.2	10	69		Y		Y
	<i>Bromus hordeaceus</i>	100.0	4.7	3.9	0.1	8				Y
	<i>Bromus diandrus</i>	80.0	6.7	5.6	0.2	20				Y
	<i>Lolium perenne</i>	80.0	3.7	3.0	0.1	10				Y
	<i>Chlorogalum pomeridianum</i>	80.0	0.4	0.3	0.1	1				Y
	<i>Nassella pulchra</i>	60.0	0.2	0.1	0.1	0.2				Y
	<i>Sanicula bipinnatifida</i>	40.0	0.1	0.1	0.1	0.2				
	<i>Dichelostemma capitatum</i>	40.0	0.1	0.1	0.1	0.2				
	<i>Centaurea melitensis</i>	40.0	0.1	0.1	0.1	0.2				
	<i>Sisyrinchium bellum</i>	40.0	0.1	0.1	0.1	0.2				
	<i>Erodium</i> spp.	40.0	0.1	0.1	0.1	0.2				
<i>Grindelia</i> spp.	40.0	0.1	0.1	0.1	0.2					

Avena barbata – *Avena fatua* Semi-natural Association
Avena spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance

<i>Centaurea solstitialis</i>	40.0	0.1	0.1	0.1	0.2
<i>Hirschfeldia incana</i>	40.0	0.1	0.1	0.1	0.2

***Brachypodium distachyon* Semi-natural Association**

Common Name: Purple False Brome Patches

Alliance: *Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance

Local Vegetation Description

The Purple False Brome Association forms a continuous herbaceous layer. The shrub layer is open or absent and the tree layer is sparse or absent. Dominant herbs include *Brachypodium distachyon*, and characteristic herbs include *Avena* spp. Those herbs often present include *Briza maxima*, *Bromus diandrus*, *Carduus pycnocephalus*, *Erodium botrys*, and *Nassella pulchra*, and herbs that are sometimes present include *Anagallis arvensis*, *Bromus carinatus*, *Bromus hordeaceus*, *Cynosurus echinatus*, *Eschscholzia californica*, *Hypochaeris glabra*, *Hypochaeris radicata*, *Lolium perenne*, *Lupinus nanus*, *Melica californica*, *Plantago lanceolata*, *Sanicula bipinnatifida*, and *Trifolium hirtum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.5	0.0 – 1.0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	3.5	0.0 – 7.0	no data	no data
Herb	95	94 – 96	no data	no data

Local Environmental Description

Elevation: Mean 191 m, Range 15 – 367 m

Aspect: SE (1), SW (1)

Slope: Mean 24 degrees, Range 15 – 32 degrees

Macro Topography: Upper 1/3 of slope (1), Backslope (cliff) (1)

Large Rock: 0.0%

Small Rock: 80.0%

Fines Cover: 0.2%

Litter Cover: Mean 1.6%, Range 0.2 – 3%

Soil Texture (field assessed): Moderately fine sandy clay loam (1)

Geology (field or map data): Sandstone and other sedimentary (1)

San Mateo County Watersheds:

Other Watersheds, Santa Clara Co.: Guadalupe River (1)

Site Impacts

This association has greater cover of exotics (average 95.4%) than natives. Non-native species that occur with highest frequency and abundance include *Anagallis*

Brachypodium distachyon Semi-natural Association
Avena spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance

arvensis, *Avena* spp., *Brachypodium distachyon*, *Briza maxima*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Cynosurus echinatus*, *Erodium botrys*, *Hypochaeris glabra*, *Hypochaeris radicata*, *Lolium perenne*, *Plantago lanceolata*, and *Trifolium hirtum*.

Classification Comments

Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Keeler-Wolf et al. 2003a, Klein et al. 2015, Rodriguez et al. 2017, Sproul et al. 2011, Verdone and Evens 2010

Global Rarity Rank: GNA

State Rarity Rank: SNA

State Rare: N

Surveys Used for Description

Total: N=2; San Mateo County (n=1): GGNRA261

Santa Clara County (n=1): CORT002

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus douglasii</i>	50.0	50.0	0.5	1	1				Y
Shrub	<i>Baccharis pilularis</i>	50.0	50.0	3.5	7	7				Y
Herb	<i>Brachypodium distachyon</i>	100.0	48.8	67.0	65	69			Y	Y
	<i>Bromus diandrus</i>	100.0	1.4	2.0	1	3				Y
	<i>Centaurea solstitialis</i>	100.0	0.4	0.6	0.2	1				Y
	<i>Hypochaeris glabra</i>	50.0	17.6	25.0	50	50				Y
	<i>Lolium perenne</i>	50.0	14.3	19.0	38	38				Y
	<i>Avena</i> spp.	50.0	7.9	10.5	21	21				Y
	<i>Carpobrotus edulis</i>	50.0	4.6	6.5	13	13				Y
	<i>Picris echioides</i>	50.0	1.8	2.5	5	5				Y
	<i>Hordeum</i> spp.	50.0	1.1	1.5	3	3				Y
	<i>Medicago</i> spp.	50.0	1.1	1.5	3	3				Y
	<i>Lotus</i> spp.	50.0	0.4	0.5	1	1				Y
	<i>Achillea millefolium</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Anagallis arvensis</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Fragaria chiloensis</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Raphanus sativus</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Geranium dissectum</i>	50.0	0.1	0.1	0.2	0.2				Y

Brachypodium distachyon Semi-natural Association
Avena spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance

	<i>Erigeron glaucus</i>	50.0	0.1	0.1	0.2	0.2	Y
	<i>Dudleya farinosa</i>	50.0	0.1	0.1	0.2	0.2	Y
	<i>Brassica rapa</i>	50.0	0.1	0.1	0.2	0.2	Y
	<i>Bromus hordeaceus</i>	50.0	0.1	0.1	0.2	0.2	Y
	<i>Bromus carinatus</i>	50.0	0.1	0.1	0.2	0.2	Y
	<i>Artemisia pycnocephala</i>	50.0	0.1	0.1	0.2	0.2	Y
Non-Vascular							
	Moss	50.0	50.0	0.1	0.2	0.2	Y

***Bromus hordeaceus* – *Erodium botrys* Semi-natural Association**

Common Name: Soft Chess – Filaree Patches

Alliance: *Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance

Local Vegetation Description

The Soft Chess – Filaree Association forms an open to continuous herbaceous layer. The shrub layer is absent and the tree layer is absent. Characteristic herbs include *Bromus diandrus*, *Bromus hordeaceus*, and *Erodium botrys*. Those herbs often present include *Aira caryophylllea*, *Anagallis arvensis*, *Avena* spp., *Carduus pycnocephalus*, *Hypochaeris glabra*, *Lolium perenne*, *Lupinus bicolor*, and *Nassella pulchra*, and herbs that are sometimes present include *Briza maxima*, *Briza minor*, *Bromus madritensis*, *Camissonia ovata*, *Chlorogalum pomeridianum*, *Clarkia purpurea*, *Cynosurus echinatus*, *Elymus multisetus*, *Eschscholzia californica*, *Galium aparine*, *Geranium dissectum*, *Leptosiphon androsaceus*, *Logfia gallica*, *Lotus* spp., *Madia gracilis*, *Plantago erecta*, *Plantago lanceolata*, *Rumex acetosella*, *Sanicula bipinnatifida*, *Sherardia arvensis*, *Sidalcea malviflora*, *Silene gallica*, *Soliva sessilis*, *Trifolium depauperatum*, *Trifolium dubium*, *Trifolium hirtum*, *Trifolium willdenovii*, *Triphysaria pusilla*, *Vicia sativa*, and *Vulpia myuros*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.0	0.0 – 0.0	no data	no data
Herb	48.5	12 – 85	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 435 m, Range 139 – 730 m

Aspect: Flat (1), SW (1)

Slope: Mean 11 degrees, Range 0 – 22 degrees

Macro Topography: Upper 1/3 of slope to Ridgetop (1), Upper 1/3 of slope (1)

Large Rock: Mean 0.5%, Range 0.0 – 1.0%

Small Rock: Mean 3.1%, Range 2.2 – 4.0%

Fines Cover: Mean 7.5%, Range 2.0 – 13.0%

Litter Cover: Mean 85.5%, Range 78 – 93%

Soil Texture (field assessed): Moderately fine sandy clay loam (2)

Geology (field or map data): Sandstone (2)

San Mateo County Watersheds: Palo Alto (1), Pescadero Creek (1)

Site Impacts

This association has greater cover of exotics (average 77.8%) than natives. Non-native species that occur with highest frequency and abundance include *Aira caryophyllea*, *Anagallis arvensis*, *Avena* spp., *Briza maxima*, *Briza minor*, *Bromus diandrus*, *Bromus hordeaceus*, *Bromus madritensis*, *Carduus pycnocephalus*, *Cynosurus echinatus*, *Erodium botrys*, *Geranium dissectum*, *Hypochaeris glabra*, *Logfia gallica*, *Lolium perenne*, *Plantago lanceolata*, *Rumex acetosella*, *Sherardia arvensis*, *Silene gallica*, *Soliva sessilis*, *Trifolium dubium*, *Trifolium hirtum*, *Vicia sativa*, and *Vulpia myuros*.

Classification Comments

None.

References: Jimerson et al. 2000, Klein et al. 2015, Rodriguez et al. 2017, Schlising and Sanders 1982

Global Rarity Rank: GNA

State Rarity Rank: SNA

State Rare: N

Surveys Used for Description

Total: N=2; San Mateo County (n=2): SCLAR152, SMAT0004

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Bromus hordeaceus</i>	100.0	22.6	11.5	5	18				Y
	<i>Avena</i> spp.	100.0	9.9	2.1	0.2	4				Y
	<i>Carduus pycnocephalus</i>	100.0	9.1	3.0	3	3				Y

Bromus hordeaceus – *Erodium botrys* Semi-natural Association
Avena spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance

<i>Lolium perenne</i>	100.0	6.0	2.0	2	2	Y
<i>Geranium dissectum</i>	100.0	3.9	3.1	0.2	6	Y
<i>Lupinus bicolor</i>	100.0	0.6	0.2	0.2	0.2	Y
unknown Poaceae	50.0	15.5	13.5	27	27	Y
<i>Rumex acetosella</i>	50.0	6.9	6.0	12	12	Y
<i>Erodium spp.</i>	50.0	6.9	6.0	12	12	Y
<i>Erodium botrys</i>	50.0	4.9	1.0	2	2	Y
<i>Achillea millefolium</i>	50.0	2.5	0.5	1	1	Y
<i>Bromus diandrus</i>	50.0	2.5	0.5	1	1	Y
<i>Centaurea solstitialis</i>	50.0	2.5	0.5	1	1	Y
<i>Sherardia arvensis</i>	50.0	1.1	1.0	2	2	Y
<i>Vicia sativa</i>	50.0	0.6	0.5	1	1	Y
<i>Hypochaeris glabra</i>	50.0	0.6	0.5	1	1	Y
<i>Vicia spp.</i>	50.0	0.5	0.1	0.2	0.2	Y
unknown Asteraceae	50.0	0.5	0.1	0.2	0.2	Y
<i>Nassella pulchra</i>	50.0	0.5	0.1	0.2	0.2	Y
<i>Plagiobothrys spp.</i>	50.0	0.5	0.1	0.2	0.2	Y
<i>Chlorogalum pomeridianum</i>	50.0	0.5	0.1	0.2	0.2	Y
<i>Eschscholzia californica</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Amsinckia spp.</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Sidalcea malviflora</i>	50.0	0.1	0.1	0.2	0.2	Y
Forb (herbaceous, not grass nor grasslike)	50.0	0.1	0.1	0.2	0.2	Y
<i>Cynosurus echinatus</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Trifolium willdenovii</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Trifolium hirtum</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Centaurea melitensis</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Clarkia purpurea</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Clarkia rubicunda</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Silene gallica</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Elymus multisetus</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Dichelostemma spp.</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Agoseris spp.</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Sanicula bipinnatifida</i>	50.0	0.1	0.1	0.11	0.11	Y
Non-Vascular						
Lichen	50.0	25.0	0.1	0.2	0.2	Y
Moss	50.0	25.0	0.1	0.2	0.2	Y

***Bidens cernua* – *Euthamia occidentalis* – *Ludwigia palustris*
Herbaceous Provisional Alliance**



Common Name: Nodding beggarticks – western goldentop – marsh seedbox mudflats

NVC Alliance Code: A3850. *Bidens cernua* - *Euthamia occidentalis* - *Ludwigia palustris* Intertidal Mudflat Alliance

Statewide Description

Artemisia douglasiana, *Bidens cernua*, *Euthamia occidentalis* and/or *Ludwigia palustris* is dominant or co- dominant in the herbaceous layer with *Amaranthus* spp., *Baccharis douglasii*, *Eleocharis* spp., *Epilobium* spp., *Euphorbia* spp., *Hirschfeldia incana*, *Persicaria hydropiperoides*, *Rumex* spp., *Sagittaria latifolia* or *Urtica dioica*. Emergent trees and shrubs may be present at low cover, including *Rubus ursinus* and *Sambucus nigra*.

This herbaceous alliance is found in the western U.S. and occurs in low-elevation marshes, meadows, and mudflats along low-gradient streams, shallow ponds, and depressional wetlands (NatureServe 2019). It is dominated by a mixture of low-growing herbs, prostrate forbs, drying aquatic plants, and taller perennial herbs. Specifically, these are species that can tolerate early-season flooding and summer drying that expose mudflats with subsurface moisture. Potentially dominant plants include *Amaranthus* ssp., *Artemisia douglasiana*, *Bidens cernua*, *Eleocharis* spp., *Euphorbia* spp., *Euthamia occidentalis*, *Ludwigia palustris*, *Persicaria hydropiperoides*, and *Sagittaria latifolia*, though many more species have been recorded.

Local Vegetation Description

The Nodding beggarticks – western goldentop – marsh seedbox mudflats Alliance forms an intermittent to continuous herbaceous layer. The shrub layer is open and the tree layer is absent. Characteristic herbs include *Cirsium vulgare* and *Mentha pulegium*. Those herbs often present include *Baccharis glutinosa*, *Centaurium tenuiflorum*, *Dittrichia graveolens*, *Gnaphalium palustre*, *Helenium puberulum*, *Leontodon taraxacoides*, *Phyla nodiflora*, *Picris echioides*, *Rumex crispus*, and *Sonchus asper*, and herbs that are sometimes present include *Achillea millefolium*, *Carduus pycnocephalus*, *Centaurium muehlenbergii*, *Cicuta douglasii*, *Conyza canadensis*, *Deschampsia cespitosa*, *Epilobium ciliatum*, *Euthamia occidentalis*, *Hoita orbicularis*, *Juncus effusus*, *Juncus patens*, *Juncus phaeocephalus*, *Lythrum hyssopifolium*, *Madia sativa*, *Matricaria discoidea*, *Polygonum hydropiperoides*, *Polygonum punctatum*, *Rumex occidentalis*, *Rumex salicifolius*, *Senecio hydrophilus*, *Solidago velutina*, *Stachys ajugoides*, and *Typha domingensis*. Commonly associated emergent shrubs at sparse cover include *Rubus ursinus*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	3.3	0 – 10	0.3	0 – 0.5
Herb	72.5	40 – 100	0.9	0 – 2

Local Membership Rule

Euthamia occidentalis, *Hoita orbicularis*, *Bidens* spp., and/or the native herb *Ludwigia palustris* dominates or co-dominates in wetlands with emergent shrubs such as *Rubus ursinus*. *Baccharis glutinosa* (= *B. douglasii*) is often present.

Local Environmental Description

Elevation: Mean 55 m, Range 11 – 92 m

Aspect: NE (2), SW (1)

Slope: Mean 2 degrees, Range 0 – 3 degrees

Macro Topography: Lower 1/3 of slope (2), Bottom (1)

Large Rock: 0.0%

Small Rock: Mean 0.1%, Range 0.0 – 0.2%

Fines Cover: Mean 66.0%, Range 5.0 – 97%

Litter Cover: Mean 32.0%, Range 2.0 – 92%

Soil Texture (field assessed): Medium silt loam (2), Fine sand (1)

Geology (field or map data): Franciscan melange (3), Sandstone (1)

San Mateo County Watersheds: Pescadero Creek (1), San Mateo Bayside (1)

Other Watersheds, Marin Co.: Novato (2)

Site Impacts

This alliance has moderate non-native plant cover (average 21.8%) relative to native cover. Non-native species that occur with highest frequency and abundance include

Carduus pycnocephalus, *Centaureum tenuiflorum*, *Cirsium vulgare*, *Dittrichia graveolens*, *Leontodon taraxacoides*, *Lythrum hyssopifolium*, *Matricaria discoidea*, *Mentha pulegium*, *Picris echioides*, *Rumex crispus*, and *Sonchus asper*.

Associations in San Mateo County

- *Euthamia occidentalis*

Classification Comments

None.

References: Christy
2004

Global Rarity Rank: GNR **State Rarity Rank:** S4

Surveys Used for Description

Total: N=4; San Mateo County (n=2): PWFWM02A, SMAT0328

Marin County (n=2): MARIN106, MARIN108

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Rubus ursinus</i>	50.0	37.5	2.6	0.2	10				Y
	<i>Ribes divaricatum</i>	25.0	12.5	0.1	0.2	0.2				
Herb	<i>Mentha pulegium</i>	75.0	10.9	4.4	0.2	17	Y			Y
	<i>Cirsium vulgare</i>	75.0	0.2	0.2	0.2	0.2	Y			Y
	<i>Gnaphalium palustre</i>	50.0	23.8	17.5	3	67				Y
	<i>Centaureum tenuiflorum</i>	50.0	9.6	3.8	0.2	15				Y
	<i>Baccharis glutinosa</i>	50.0	2.5	2.6	0.2	10				Y
	<i>Phyla nodiflora</i>	50.0	4.2	2.5	3	7				Y
	<i>Rumex crispus</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Picris echioides</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Sonchus asper</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Leontodon taraxacoides</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Helenium puberulum</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Dittrichia graveolens</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Hoita orbicularis</i>	25.0	21.1	21.9	87.5	87.5				
	<i>Euthamia occidentalis</i>	25.0	24.8	20.0	80	80				
<i>Typha domingensis</i>	25.0	0.7	0.8	3	3					
<i>Polygonum punctatum</i>	25.0	0.0	0.1	0.2	0.2					
<i>Stachys ajugoides</i>	25.0	0.0	0.1	0.2	0.2					

Bidens cernua – *Euthamia occidentalis* – *Ludwigia palustris* Herbaceous Provisional Alliance

<i>Solidago velutina</i>	25.0	0.1	0.1	0.2	0.2
<i>Carduus pycnocephalus</i>	25.0	0.0	0.1	0.2	0.2
<i>Senecio hydrophilus</i>	25.0	0.0	0.1	0.2	0.2
<i>Rumex salicifolius</i>	25.0	0.0	0.1	0.2	0.2
<i>Centaurium muehlenbergii</i>	25.0	0.1	0.1	0.2	0.2
<i>Achillea millefolium</i>	25.0	0.0	0.1	0.2	0.2
<i>Polygonum hydropiperoides</i>	25.0	0.1	0.1	0.2	0.2
<i>Juncus effusus</i>	25.0	0.0	0.1	0.2	0.2
<i>Rumex occidentalis</i>	25.0	0.1	0.1	0.2	0.2
<i>Epilobium ciliatum</i>	25.0	0.0	0.1	0.2	0.2
<i>Cicuta douglasii</i>	25.0	0.0	0.1	0.2	0.2
<i>Juncus patens</i>	25.0	0.0	0.1	0.2	0.2
<i>Juncus phaeocephalus</i>	25.0	0.0	0.1	0.2	0.2
<i>Lythrum hyssopifolium</i>	25.0	0.1	0.1	0.2	0.2
<i>Matricaria discoidea</i>	25.0	0.1	0.1	0.2	0.2
<i>Madia sativa</i>	25.0	0.1	0.1	0.2	0.2
<i>Deschampsia cespitosa</i>	25.0	0.0	0.1	0.2	0.2
<i>Coryza canadensis</i>	25.0	0.1	0.1	0.2	0.2

***Euthamia occidentalis* Provisional Association**

Common Name: Western Goldentop Mudflats Patches

Alliance: *Bidens cernua* – *Euthamia occidentalis* – *Ludwigia palustris* Herbaceous Alliance

Local Vegetation Description

The Western Goldentop Mudflats Association forms a continuous herbaceous layer in the single survey available. The shrub layer is open and the tree layer is absent. Dominant herbs include *Euthamia occidentalis*, and characteristic herbs include *Baccharis glutinosa*, *Centaureum muehlenbergii*, *Helenium puberulum*, and *Rumex occidentalis*. Commonly associated emergent shrubs at sparse cover include *Rubus ursinus*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	NA	no data	no data
Hardwood	0.0	NA	no data	no data
Regenerating or Shrubby Tree	0.0	NA	no data	no data
Shrub	10.0	NA	0.3	0 – 0.5
Herb	80.0	NA	1.5	1 – 2

Local Environmental Description

Elevation: 11 m

Aspect: SW (1)

Slope: 2 degrees

Macro Topography: Bottom (1)

Large Rock: 0.0%

Small Rock: 0.2%

Fines Cover: 5.0%

Litter Cover: 92%

Soil Texture (field assessed): Fine sand (1)

Geology (field or map data): Sandstone (1)

San Mateo County Watersheds: Pescadero Creek (1)

Site Impacts

This association has very low non-native plant cover (average 0.0%) relative to native cover. No non-native species were recorded in the field.

Classification Comments

This association is considered provisional since it is under-sampled in its expected range.

Euthamia occidentalis Provisional Association
Bidens cernua – *Euthamia occidentalis* – *Ludwigia palustris* Herbaceous Alliance

References: Christy 2004

Global Rarity Rank: G3

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=1; San Mateo County (n=1): SMAT0328

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Rubus ursinus</i>	100.0	100.0	10.0	10	10		Y		Y
	<i>Euthamia occidentalis</i>	100.0	99.0	80.0	80	80		Y		Y
Herb	<i>Rumex occidentalis</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Helenium puberulum</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Baccharis glutinosa</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Centaureum</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>muehlenbergii</i>	100.0	0.2	0.2	0.2	0.2				Y

***Bolboschoenus maritimus* Herbaceous Alliance**



Common Name: Salt marsh bulrush marshes

NVC Alliance Code: A3895. *Schoenoplectus americanus* - *Schoenoplectus acutus* - *Schoenoplectus californicus* Marsh Alliance

Statewide Description

Bolboschoenus maritimus is dominant or co-dominant in the herbaceous layer with *Agrostis stolonifera*, *Argentina egedii*, *Atriplex prostrata*, *Bolboschoenus robustus*, *Chenopodium foliosum*, *Cotula coronopifolia*, *Distichlis spicata*, *Eleocharis macrostachya*, *Lemna minuta*, *Sarcocornia pacifica*, *Sesuvium verrucosum*, *Spergularia salina*, and *Typha latifolia*.

This alliance occurs in tidal marshes with relatively high salinity, at intermediate tidal elevations with seasonal flooding (Keeler-Wolf and Vaghti 2000, Pickart 2006). Inland marshes in areas with alkali, brackish, or fresh water contain different associates than stands found in coastal marshes.

Bolboschoenus maritimus usually dominates in the wetter, tidal, brackish to sub-saline marshes and ditches, including early successional sites of diked marshes within relict swales and depressions (Baye 2000).

Local Vegetation Description

The Salt marsh bulrush marshes Alliance forms an intermittent to continuous herbaceous layer. The shrub layer is absent and the tree layer is absent. Dominant herbs include *Bolboschoenus maritimus*, and characteristic herbs include *Sarcocornia*

pacifica. Herbs that are sometimes present include *Atriplex prostrata*, *Cuscuta salina*, *Frankenia salina*, *Grindelia stricta*, *Rumex* spp., and *Spartina foliosa*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.0	0 – 0	no data	no data
Herb	64.0	45 – 85	1.1	0.5 – 2

Local Membership Rule

Bolboschoenus maritimus or *B. robustus* dominates or co-dominates with *Sarcocornia* (= *Salicornia*) *pacifica*.

Local Environmental Description

Elevation: Mean 7 m, Range 4 – 11 m

Aspect: Flat (3), NW (1)

Slope: Mean 0 degrees, Range 0 – 1 degrees

Macro Topography: Bottom (3), Lower 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 46.8%, Range 20.0 – 92.0%

Litter Cover: Mean 44.5%, Range 3.0 – 75%

Soil Texture (field assessed): Muck (3), Fine silty clay (1)

Geology (field or map data): Alluvium (2), Silty alluvium (1), Sandstone and other sedimentary (1)

San Mateo County Watersheds: Pescadero Creek (2), San Gregorio Creek (1)

Other Watersheds, Marin Co.: Novato (1)

Site Impacts

This alliance has very low non-native plant cover (average 0.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Atriplex prostrata*.

Associations in San Mateo County

- *Bolboschoenus maritimus*
- *Bolboschoenus maritimus* – *Sarcocornia pacifica*

Classification Comments

Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: Keeler-Wolf and Vaghti 2000, Klein et al. 2015, Pickart 2006, Sproul et al. 2011

Global Rarity Rank: G4

State Rarity Rank: S3

Surveys Used for Description

Total: N=4; San Mateo County (n=3): SMAT0045, SMAT0125, SMAT0266

Marin County (n=1): MARIN019

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Bolboschoenus maritimus</i>	100.0	76.7	51.8	22	80	Y	Y		Y
	<i>Sarcocornia pacifica</i>	75.0	7.0	5.5	2	15	Y			Y
	<i>Spartina foliosa</i>	25.0	14.3	8.0	32	32				
	<i>Frankenia salina</i>	25.0	1.5	1.3	5	5				
	<i>Grindelia stricta</i>	25.0	0.3	0.3	1	1				
	<i>Cuscuta salina</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Rumex spp.</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Atriplex prostrata</i>	25.0	0.1	0.1	0.2	0.2				

***Bolboschoenus maritimus* Association**

Common Name: Salt Marsh Bulrush Patches

Alliance: *Bolboschoenus maritimus* Herbaceous Alliance

Local Vegetation Description

The Salt Marsh Bulrush Association forms an intermittent to continuous herbaceous layer. The shrub layer is absent and the tree layer is absent. Dominant herbs include *Bolboschoenus maritimus*. Those herbs often present include *Sarcocornia pacifica*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.0	0.0 – 0.0	no data	no data
Herb	65.0	45 – 85	1.1	0.5 – 2

Local Environmental Description

Elevation: Mean 8 m, Range 4 – 11 m

Aspect: Flat (2)

Slope: 0 degrees

Macro Topography: Bottom (2)

Large Rock:0.0%

Small Rock: 0.0%

Fines Cover: Mean 22.5%, Range 20 – 25%

Litter Cover: Mean 67.5%, Range 60 – 75%

Soil Texture (field assessed): Fine silty clay (1), Muck (1)

Geology (field or map data): Silty alluvium (1), Sandstone and other sedimentary (1)

San Mateo County Watersheds: Pescadero Creek (1), San Gregorio Creek (1)

Site Impacts

This association has very low non-native plant cover (average 0.0%) relative to native cover. No non- native species were recorded in the field.

Classification Comments

None.

References: Klein et al. 2015, Pickart 2006

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=2; San Mateo County (n=2): SMAT0125, SMAT0266

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Bolboschoenus maritimus</i>	100.0	97.1	62.5	45	80		Y		Y
	<i>Sarcocornia pacifica</i>	50.0	2.9	2.5	5	5				Y

***Bolboschoenus maritimus* – *Sarcocornia pacifica* Association**

Common Name: Salt Marsh Bulrush – Pacific Glasswort Patches

Alliance: *Bolboschoenus maritimus* Herbaceous Alliance

Local Vegetation Description

The Salt Marsh Bulrush – Pacific Glasswort Association forms an intermittent to continuous herbaceous layer. The shrub layer is absent and the tree layer is absent. Dominant herbs include *Bolboschoenus maritimus*, and characteristic herbs include *Sarcocornia pacifica*. Those herbs often present include *Atriplex prostrata*, *Cuscuta salina*, *Frankenia salina*, *Grindelia stricta*, *Rumex* spp., and *Spartina foliosa*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.0	0.0 – 0.0	no data	no data
Herb	63.0	56 – 70	1.1	0.5 – 2

Local Environmental Description

Elevation: Mean 7 m, Range 5 – 8 m

Aspect: Flat (1), NW (1)

Slope: Mean 1 degrees, Range 0 – 1 degrees

Macro Topography: Bottom (1), Lower 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 71.0%, Range 50.0 – 92.0%

Litter Cover: Mean 21.5%, Range 3.0 – 40%

Soil Texture (field assessed): Muck (2)

Geology (field or map data): Alluvium (2)

San Mateo County Watersheds: Pescadero Creek (1)

Other Watersheds, Marin Co.: Novato (1)

Site Impacts

This association has very low non-native plant cover (average 0.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Atriplex prostrata*.

Classification Comments

Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Keeler-Wolf and Vaghti 2000, Klein et al. 2015, Sproul et al. 2011

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=2; San Mateo County (n=1): SMAT0045

Marin County (n=1): MARIN019

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Bolboschoenus maritimus</i>	100.0	56.4	41.0	22	60		Y		Y
	<i>Sarcocornia pacifica</i>	100.0	11.0	8.5	2	15				Y
	<i>Spartina foliosa</i>	50.0	28.6	16.0	32	32				Y
	<i>Frankenia salina</i>	50.0	3.1	2.5	5	5				Y
	<i>Grindelia stricta</i>	50.0	0.6	0.5	1	1				Y
	<i>Atriplex prostrata</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Rumex spp.</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Cuscuta salina</i>	50.0	0.1	0.1	0.2	0.2				Y

***Brassica nigra* – *Centaurea (solstitialis, melitensis)* Herbaceous
Semi-Natural Alliance**



Common Name: Upland mustards – yellow star-thistles and other ruderal forbs

NVC Alliance Code: A4214. *Brassica nigra* - *Raphanus* spp. Ruderal Annual Forb Meadow Alliance

Statewide Description

Brassica nigra, *Brassica rapa*, *Carduus pycnocephalus*, *Centaurea melitensis*, *Centaurea solstitialis*, *Cynara cardunculus*, *Euphorbia terracina*, *Hirschfeldia incana*, *Isatis tinctoria* or *Raphanus sativus* or similar ruderal forb is dominant in the herbaceous layer. Emergent trees and shrubs may be present at low cover.

We have included five mustards within this alliance based on their ecological similarities, and we also have updated the alliance to include other non-native invasive forbs including *Cynara cardunculus*, *Euphorbia terracina*, *Carduus pycnocephalus*, *Centaurea solstitialis*, *C. melitensis*, and *C. sulphurea*. As a whole, stands of this alliance form dense colonies that overtop other plants whether they are native or non-native. All respond positively to regular frequent disturbance, whether it be fire, disking, intermittent flooding, or heavy grazing.

Local Vegetation Description

The Upland mustards – yellow star-thistles and other ruderal forbs Alliance forms an

intermittent to continuous herbaceous layer. The shrub layer is open and the tree layer is absent. Characteristic herbs include *Avena* spp.. and *Bromus diandrus*. Those herbs often present include *Bromus hordeaceus* and *Carduus pycnocephalus*, and herbs that are sometimes present include *Aira caryophylla*, *Anagallis arvensis*, *Anaphalis margaritacea*, *Brachypodium distachyon*, *Brassica* spp., *Briza maxima*, *Calystegia* spp., *Centaurea solstitialis*, *Clarkia purpurea*, *Clarkia* spp., *Conium maculatum*, *Crepis vesicaria*, *Daucus*

carota, *Daucus pusillus*, *Dichelostemma capitatum*, *Eriogonum latifolium*, *Eriophyllum stoechadifolium*, *Erodium* spp., *Eschscholzia californica*, *Foeniculum vulgare*, *Galium aparine*, *Geranium dissectum*, *Hirschfeldia incana*, *Hordeum* spp., *Hypochaeris glabra*, *Hypochaeris radicata*, *Hypochaeris* spp., *Juncus bufonius*, *Juncus patens*, *Linum bienne*, *Lolium perenne*, *Madia sativa*, *Medicago* spp., *Nassella pulchra*, *Oxalis pes-caprae*, *Picris echioides*, *Plantago lanceolata*, *Pteridium aquilinum*, *Raphanus sativus*, *Rumex crispus*, *Scandix pecten-veneris*, *Silybum marianum*, *Sonchus asper*, *Trifolium* spp., *Urospermum picroides*, *Vicia gigantea*, *Vicia sativa*, and *Vulpia bromoides*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis* and *Rubus ursinus*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	2.0	0 – 10	0.3	0 – 0.5
Herb	69.0	50 – 90	0.3	0 – 0.5

Local Membership Rule

Brassica nigra, *Raphanus sativus*, *Carduus pycnocephalus*, *Centaurea solstitialis*, *Silybum marianum*, or another non-native forb dominates in the herbaceous layer, often in old or active agriculture lands.

Local Environmental Description

Elevation: Mean 287 m, Range 17 – 681 m

Aspect: SW (3), SE (1)

Slope: Mean 14 degrees, Range 5 – 28 degrees

Macro Topography: Upper 1/3 of slope to Ridgetop (2), Lower 1/3 of slope (1), Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: Mean 2.6%, Range 0.0 – 5.2%

Fines Cover: Mean 37.5%, Range 10.0 – 70.0%

Litter Cover: Mean 56.0%, Range 25.0 – 80%

Soil Texture (field assessed): Moderately fine clay loam (2), Medium silt loam (1), Unknown (1)

Geology (field or map data): Sandstone (2), Mixed sedimentary (1), Serpentine (1), Volcanic and metavolcanic rocks (1)

Brassica nigra – *Centaurea (solstitialis, melitensis)* Herbaceous Semi-Natural Alliance

San Mateo County Watersheds: San Gregorio Creek (2), Ano Nuevo (1), Palo Alto (1), San Mateo Bayside (1)

Site Impacts

This alliance has greater cover of exotics than natives, non-native plant cover (average 93.9%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira caryophylla*, *Anagallis arvensis*, *Brachypodium distachyon*, *Briza maxima*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Centaurea solstitialis*, *Conium maculatum*, *Crepis vesicaria*, *Daucus carota*, *Foeniculum vulgare*, *Geranium dissectum*, *Hirschfeldia incana*, *Hypochaeris glabra*, *Hypochaeris radicata*, *Linum bienne*, *Oxalis pes-caprae*, *Picris echioides*, *Plantago lanceolata*, *Raphanus sativus*, *Rumex crispus*, *Scandix pecten-veneris*, *Silybum marianum*, *Sonchus asper*, *Urospermum picroides*, *Vicia sativa*, and *Vulpia bromoides*.

Associations in San Mateo County

- *Carduus pycnocephalus* – *Silybum marianum*
- *Centaurea solstitialis*
- *Raphanus sativus*

Classification Comments

None.

References: Buck-Diaz et al. 2012, Keeler-Wolf and Evens 2006, Keeler-Wolf and Vaghti 2000, Keeler-Wolf et al. 2003a, Klein et al. 2007, Klein et al. 2015, Rodriguez et al. 2017, Sproul et al. 2011

Global Rarity Rank: GNA **State Rarity Rank:** SNA

Surveys Used for Description

Total: N=5; San Mateo County (n=5): PGA1758, SMAT0096, SMAT0108, SMAT0111, SMAT0248

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	20.0	12.0	1.2	6	6				
	<i>Rubus ursinus</i>	20.0	8.0	0.8	4	4				
Herb	<i>Avena spp.</i>	80.0	2.2	1.6	0.2	5	Y			Y
	<i>Bromus diandrus</i>	80.0	1.4	1.1	0.2	3	Y			Y
	<i>Carduus pycnocephalus</i>	60.0	17.4	13.0	0.2	50				Y

Brassica nigra – *Centaurea (solstitialis, melitensis)* Herbaceous Semi-Natural Alliance

<i>Bromus hordeaceus</i>	60.0	1.4	1.0	1	3
<i>Brassica spp.</i>	40.0	18.8	17.2	1	85
<i>Centaurea solstitialis</i>	40.0	19.7	14.4	22	50
<i>Medicago spp.</i>	40.0	7.8	4.4	2	20
<i>Brachypodium distachyon</i>	40.0	1.9	1.0	0.2	5
<i>Oxalis pes-caprae</i>	40.0	1.1	0.6	0.2	3
<i>Geranium dissectum</i>	40.0	0.9	0.6	0.2	3
<i>Sonchus asper</i>	40.0	0.3	0.2	0.2	1
<i>Rumex crispus</i>	40.0	0.4	0.2	0.2	1
<i>Picris echioides</i>	40.0	0.1	0.1	0.2	0.2
<i>Conium maculatum</i>	40.0	0.1	0.1	0.2	0.2
<i>Nassella pulchra</i>	40.0	0.1	0.1	0.2	0.2
<i>Raphanus sativus</i>	20.0	10.9	6.0	30	30
<i>Briza maxima</i>	20.0	6.7	3.6	18	18
<i>Anaphalis margaritacea</i>	20.0	1.1	1.0	5	5
<i>Silybum marianum</i>	20.0	1.4	1.0	5	5
<i>Vulpia bromoides</i>	20.0	1.5	0.8	4	4
<i>Trifolium spp.</i>	20.0	0.7	0.6	3.2	3.2
unknown Poaceae	20.0	0.7	0.6	3	3
<i>Galium aparine</i>	20.0	0.5	0.4	2	2
<i>Vicia sativa</i>	20.0	0.5	0.4	2	2
<i>Vicia gigantea</i>	20.0	0.3	0.2	1	1
<i>Juncus patens</i>	20.0	0.3	0.2	1	1
<i>Daucus carota</i>	20.0	0.2	0.2	1	1
<i>Scandix pecten-veneris</i>	20.0	0.0	0.0	0.2	0.2
<i>Plantago lanceolata</i>	20.0	0.0	0.0	0.2	0.2
<i>Urospermum picroides</i>	20.0	0.1	0.0	0.2	0.2
<i>Madia sativa</i>	20.0	0.0	0.0	0.2	0.2
<i>Lolium perenne</i>	20.0	0.1	0.0	0.2	0.2
<i>Linum bienne</i>	20.0	0.1	0.0	0.2	0.2
<i>Eriogonum latifolium</i>	20.0	0.0	0.0	0.2	0.2
<i>Juncus bufonius</i>	20.0	0.1	0.0	0.2	0.2
<i>Anagallis arvensis</i>	20.0	0.1	0.0	0.2	0.2
<i>Calystegia spp.</i>	20.0	0.0	0.0	0.2	0.2
<i>Clarkia spp.</i>	20.0	0.0	0.0	0.2	0.2
<i>Clarkia purpurea</i>	20.0	0.1	0.0	0.2	0.2
<i>Crepis vesicaria</i>	20.0	0.1	0.0	0.2	0.2
<i>Dichelostemma capitatum</i>	20.0	0.0	0.0	0.2	0.2
<i>Erodium spp.</i>	20.0	0.1	0.0	0.2	0.2
<i>Eriophyllum stoechadifolium</i>	20.0	0.0	0.0	0.2	0.2
<i>Hordeum spp.</i>	20.0	0.0	0.0	0.2	0.2
<i>Hypochaeris radicata</i>	20.0	0.1	0.0	0.2	0.2
<i>Daucus pusillus</i>	20.0	0.0	0.0	0.2	0.2
<i>Hypochaeris glabra</i>	20.0	0.1	0.0	0.2	0.2
<i>Pteridium aquilinum</i>	20.0	0.0	0.0	0.2	0.2

Y

<i>Hirschfeldia incana</i>	20.0	0.1	0.0	0.2	0.2
<i>Foeniculum vulgare</i>	20.0	0.1	0.0	0.2	0.2
<i>Aira caryophylla</i>	20.0	0.0	0.0	0.2	0.2
<i>Eschscholzia californica</i>	20.0	0.0	0.0	0.2	0.2
<i>Hypochaeris spp.</i>	20.0	0.0	0.0	0.2	0.2

***Carduus pycnocephalus* – *Silybum marianum* Provisional Semi-natural Association**

Common Name: Italian Thistle Fields Patches

Alliance: *Brassica nigra* – *Centaurea (solstitialis, melitensis)* Herbaceous Semi-Natural Alliance

Local Vegetation Description

The Italian Thistle Fields Association forms an open to continuous herbaceous layer. The shrub layer is absent and the tree layer is absent. Dominant herbs include *Carduus pycnocephalus*, and characteristic herbs include *Avena* spp., *Brachypodium distachyon*, *Bromus diandrus*, *Geranium dissectum*, *Hypochaeris radicata*, *Lolium perenne*, and *Sonchus asper*. Those herbs often present include *Anagallis arvensis*, *Bromus hordeaceus*, *Conium maculatum*, *Juncus bufonius*, *Juncus patens*, *Linum bienne*, *Marah fabaceus*, *Medicago* spp., *Nassella pulchra*, *Picris echioides*, *Rumex crispus*, *Silene gallica*, *Silybum marianum*, *Urospermum picroides*, and *Vicia gigantea*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.0	0.0 – 0.0	no data	no data
Herb	47.0	24 – 70	0.5	0 – 1

Local Environmental Description

Elevation: Mean 330 m, Range 300 – 359 m

Aspect: SW (1), SE (1)

Slope: Mean 19 degrees, Range 17 – 20 degrees

Macro Topography: Middle 1/3 of slope (1), Upper 1/3 of slope to Ridgetop (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 76.0%, Range 70.0 – 82.0%

Litter Cover: Mean 20.5%, Range 16.0 – 25%

Soil Texture (field assessed): Moderately fine clay loam (1), Not recorded (1)

Geology (field or map data): Mixed sedimentary (1), Volcanic and metavolcanic rocks (1)

San Mateo County Watersheds: San Gregorio Creek (1)

Other Watersheds, Marin Co.: Lagunitas Creek (1)

Site Impacts

This association has greater cover of exotics (average 97.7%) than natives. Non-native *Carduus pycnocephalus* – *Silybum marianum* Provisional Semi-natural Association
Brassica nigra – *Centaurea (solstitialis, melitensis)* Herbaceous Semi-Natural Alliance

species that occur with highest frequency and abundance include *Anagallis arvensis*, *Avena* spp., *Brachypodium distachyon*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Conium maculatum*, *Geranium dissectum*, *Hypochaeris radicata*, *Linum bienne*, *Lolium perenne*, *Medicago* spp., *Picris echioides*, *Rumex crispus*, *Silene gallica*, *Silybum marianum*, *Sonchus asper*, and *Urospermum picroides*.

Classification Comments

This association is considered provisional since it is under-sampled in its expected range. It was newly described by us for Marin County. Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: none

Global Rarity Rank: GNA

State Rarity Rank: SNA

State Rare: N

Surveys Used for Description

Total: N=2; San Mateo County (n=1): SMAT0111

Marin County (n=1): MARIN280

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Carduus pycnocephalus</i>	100.0	79.3	36.5	23	50		Y		Y
	<i>Sonchus asper</i>	100.0	2.6	1.0	1	1				Y
	<i>Geranium dissectum</i>	100.0	2.5	1.6	0.2	3				Y
	<i>Bromus diandrus</i>	100.0	2.5	1.6	0.2	3				Y
	<i>Avena</i> spp.	100.0	1.1	0.6	0.2	1				Y
	<i>Brachypodium distachyon</i>	100.0	0.5	0.2	0.2	0.2				Y
	<i>Lolium perenne</i>	100.0	0.5	0.2	0.2	0.2				Y
	<i>Hypochaeris radicata</i>	100.0	0.5	0.2	0.2	0.2				Y
	<i>Silybum marianum</i>	50.0	3.5	2.5	5	5				Y
	<i>Bromus hordeaceus</i>	50.0	2.1	1.5	3	3				Y
	<i>Medicago</i> spp.	50.0	1.4	1.0	2	2				Y
	<i>Juncus patens</i>	50.0	0.7	0.5	1	1				Y
	<i>Vicia gigantea</i>	50.0	0.7	0.5	1	1				Y
	<i>Marah fabaceus</i>	50.0	0.4	0.1	0.2	0.2				Y
	<i>Nassella pulchra</i>	50.0	0.4	0.1	0.2	0.2				Y
	<i>Silene gallica</i>	50.0	0.4	0.1	0.2	0.2				Y
	<i>Linum bienne</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Anagallis arvensis</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Rumex crispus</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Juncus bufonius</i>	50.0	0.1	0.1	0.2	0.2				Y

Carduus pycnocephalus – *Silybum marianum* Provisional Semi-natural Association
Brassica nigra – *Centaurea (solstitialis, melitensis)* Herbaceous Semi-Natural Alliance

<i>Conium maculatum</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Picris echioides</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Urospermum picroides</i>	50.0	0.1	0.1	0.2	0.2	Y

***Centaurea solstitialis* Semi-natural Association**

Common Name: Yellow Star Thistle Fields Patches

Alliance: *Brassica nigra* – *Centaurea (solstitialis, melitensis)* Herbaceous Semi-Natural Alliance

Local Vegetation Description

The Yellow Star Thistle Fields Association forms an intermittent to continuous herbaceous layer. The shrub layer is absent and the tree layer is absent. Dominant herbs include *Centaurea solstitialis*, and characteristic herbs include *Avena* spp., *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, and *Nassella pulchra*. Those herbs often present include *Brachypodium distachyon*, *Brassica* spp., *Briza maxima*, *Calystegia* spp., *Clarkia* spp., *Clarkia purpurea*, *Crepis vesicaria*, *Daucus carota*, *Daucus pusillus*, *Dichelostemma capitatum*, *Erodium* spp., *Eschscholzia californica*, *Galium aparine*, *Hypochaeris* spp., *Hypochaeris glabra*, *Madia sativa*, *Oxalis pes-caprae*, *Scandix pecten-veneris*, *Sonchus asper*, *Trifolium* spp., *Vicia sativa*, and *Vulpia bromoides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.0	0.0 – 0.0	no data	no data
Herb	67.5	55 – 80	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 438 m, Range 194 – 681 m

Aspect: SW (2)

Slope: Mean 17 degrees, Range 6 – 28 degrees

Macro Topography: Upper 1/3 of slope to Ridgetop (2)

Large Rock: 0.0%

Small Rock: Mean 2.7%, Range 0.2 – 5.2%

Fines Cover: Mean 20.0%, Range 10.0 – 30.0%

Litter Cover: Mean 73.5%, Range 67.0 – 80%

Soil Texture (field assessed): Medium silt loam (1), Unknown (1)

Geology (field or map data): Sandstone (1), Serpentine (1)

San Mateo County Watersheds: Palo Alto (1), San Gregorio Creek (1)

Site Impacts

This association has greater cover of exotics (average 94.1%) than native cover.

Classification Comments

None.

References: Buck-Diaz et al. 2012, Klein et al. 2007, Klein et al. 2015

Global Rarity Rank: GNA

State Rarity Rank: SNA

State Rare: N

Surveys Used for Description

Total: N=2; San Mateo County (n=2): SMAT0096, SMAT0248

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Centaurea solstitialis</i>	100.0	49.2	36.0	22	50			Y	Y
	<i>Carduus pycnocephalus</i>	100.0	8.8	7.6	0.2	15				Y
	<i>Avena spp.</i>	100.0	4.7	3.5	2	5				Y
	<i>Bromus hordeaceus</i>	100.0	1.5	1.0	1	1				Y
	<i>Bromus diandrus</i>	100.0	1.3	1.1	0.2	2				Y
	<i>Nassella pulchra</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Briza maxima</i>	50.0	16.9	9.0	18	18				Y
	<i>Brachypodium distachyon</i>	50.0	4.7	2.5	5	5				Y
	<i>Vulpia bromoides</i>	50.0	3.7	2.0	4	4				Y
	<i>Trifolium spp.</i>	50.0	1.8	1.6	3.2	3.2				Y
	<i>unknown Poaceae</i>	50.0	1.7	1.5	3	3				Y
	<i>Vicia sativa</i>	50.0	1.1	1.0	2	2				Y
	<i>Galium aparine</i>	50.0	1.1	1.0	2	2				Y
	<i>Brassica spp.</i>	50.0	0.6	0.5	1	1				Y
	<i>Daucus carota</i>	50.0	0.6	0.5	1	1				Y
	<i>Crepis vesicaria</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Erodium spp.</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Hypochaeris glabra</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Clarkia purpurea</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Hypochaeris spp.</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Scandix pecten-veneris</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Sonchus asper</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Clarkia spp.</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Oxalis pes-caprae</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Calystegia spp.</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Daucus pusillus</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Dichelostemma capitatum</i>	50.0	0.1	0.1	0.2	0.2				Y

Centaurea solstitialis Semi-natural Association
Brassica nigra – *Centaurea (solstitialis, melitensis)* Herbaceous Semi-Natural Alliance

<i>Madia sativa</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Eschscholzia californica</i>	50.0	0.1	0.1	0.2	0.2	Y

***Raphanus sativus* Semi-natural Association**

Common Name: Wild Radish Fields Patches

Alliance: *Brassica nigra* – *Centaurea (solstitialis, melitensis)* Herbaceous Semi-Natural Alliance

Local Vegetation Description

The Wild Radish Fields Association forms an intermittent herbaceous layer in the single survey available. The shrub layer is absent and the tree layer is absent. Dominant herbs include *Raphanus sativus*, and characteristic herbs include *Lolium perenne*. Those herbs often present include *Bromus diandrus*, *Geranium dissectum*, *Rumex crispus*, and *Stellaria media*, and herbs that are sometimes present include *Claytonia perfoliata*, *Marah fabaceus*, *Rumex acetosella*, and *Vicia* spp.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	NA	no data	no data
Hardwood	0.0	NA	no data	no data
Regenerating or Shrubby Tree	0.0	NA	no data	no data
Shrub	0.0	NA	no data	no data
Herb	50.0	NA	0.3	0 – 0.5

Local Environmental Description

Elevation: 17 m

Aspect: SW (1)

Slope: 5 degrees

Macro Topography: Lower 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 5.0%

Fines Cover: 40.0%

Litter Cover: 52%

Soil Texture (field assessed): Moderately fine clay loam (1)

Geology (field or map data): Sandstone (1)

San Mateo County Watersheds: Ano Nuevo (1)

Site Impacts

This association has greater cover of exotics (average 100.0%) than native cover. Non-native species that occur with highest frequency and abundance include *Bromus diandrus*, *Geranium dissectum*, *Lolium perenne*, *Raphanus sativus*, *Rumex acetosella*, *Rumex crispus*, and *Stellaria media*.

Classification Comments

Raphanus sativus Semi-natural Association
Brassica nigra – *Centaurea (solstitialis, melitensis)* Herbaceous Semi-Natural Alliance

None.

References: Keeler-Wolf and Vaghti 2000, Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: GNA

State Rarity Rank: SNA

State Rare: N

Surveys Used for Description

Total: N=1; San Mateo County (n=1): SMAT0108

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Raphanus sativus</i>	100.0	54.5	30.0	30	30		Y		Y
	<i>Medicago spp.</i>	100.0	36.4	20.0	20	20			Y	Y
	<i>Oxalis pes-caprae</i>	100.0	5.5	3.0	3	3				Y
	<i>Rumex crispus</i>	100.0	1.8	1.0	1	1				Y
	<i>Foeniculum vulgare</i>	100.0	0.4	0.2	0.2	0.2				Y
	<i>Hirschfeldia incana</i>	100.0	0.4	0.2	0.2	0.2				Y
	<i>Picris echioides</i>	100.0	0.4	0.2	0.2	0.2				Y
	<i>Bromus diandrus</i>	100.0	0.4	0.2	0.2	0.2				Y
	<i>Geranium dissectum</i>	100.0	0.4	0.2	0.2	0.2				Y

***Bromus carinatus* – *Elymus glaucus* Herbaceous Alliance**



Common Name: California brome – blue wildrye prairie

NVC Alliance Code: A4244. *Bromus carinatus* - *Elymus glaucus* Mesic Meadow Alliance

Statewide Description

Elymus glaucus, *Bromus carinatus*, *Bromus maritimus*, and/or *Pteridium aquilinum* dominate or co-dominate in the herbaceous layer with *Agrostis scabra*, *Anagallis arvensis*, *Bromus diandrus*, *Calamagrostis canadensis*, *Carex feta*, *Carex pellita*, *Glyceria striata*, *Heracleum maximum*, *Juncus oxymeris*, *Phleum pratense*, *Poa pratensis*, *Senecio clarkianus*, *Senecio triangularis*, *Solidago canadensis*, *Stachys albens*, *Veratrum californicum*, and *Vulpia bromoides*.

This alliance is represented by four different taxa, *Elymus glaucus*, *Bromus carinatus*, *B. maritimus*, and *Pteridium aquilinum*, which because of their ecological relatedness, have been combined into a single alliance. The *Pteridium aquilinum* Association is currently known only from the northern Coast Ranges.

Sawyer (2009) stands dominated by *E. glaucus*, *B. carinatus*, or *P. aquilinum* were assigned to the *Elymus glaucus*, *Bromus carinatus*, or *Pteridium aquilinum* Association respectively, each within its own provisional alliance. Based on recent county-wide analyses, we now recognize one alliance which contains elements of these three associations. Mixes of *Bromus carinatus* and *Elymus glaucus* with a high cover of *Pteridium* are placed in the *Pteridium aquilinum* Association.

Bromus carinatus – *Elymus glaucus* Herbaceous Alliance

Local Vegetation Description

The California brome – blue wildrye prairie Alliance forms an intermittent to continuous herbaceous layer. The shrub layer is sparse to open and the tree layer is sparse or absent. Characteristic herbs include *Bromus carinatus* and *Elymus glaucus* along with *Achillea millefolium*, *Avena* spp., *Bromus hordeaceus*, *Rumex acetosella*, and *Vulpia bromoides*. Those herbs often present include *Aira caryophyllea*, *Bromus diandrus*, *Clarkia rubicunda*, *Geranium dissectum*, *Lolium perenne*, *Madia sativa*, and *Sisyrinchium bellum*, and herbs that are sometimes present include *Agoseris grandiflora*, *Anagallis arvensis*, *Briza minor*, *Carduus pycnocephalus*, *Chlorogalum pomeridianum*, *Cirsium vulgare*, *Clarkia purpurea*, *Crepis vesicaria*, *Cynosurus echinatus*, *Erodium botrys*, *Eschscholzia californica*, *Galium aparine*, *Hypochaeris radicata*, *Lupinus bicolor*, *Ranunculus californicus*, *Sidalcea malviflora*, *Sonchus asper*, *Torilis nodosa*, *Triteleia laxa*, and *Vicia sativa*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis*. Commonly associated non-vascular plants include Moss.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0.2	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	1.0	0 – 6	0.3	0 – 0.5
Herb	73.3	55 – 85	0.7	0 – 2

Local Membership Rule

Bromus carinatus, *Elymus glaucus* and/or *Pteridium aquilinum* dominate or co-dominate near meadows, in forested openings, and on elevated flats. *Achillea millefolium*, *Bromus hordeaceus*, *Geranium dissectum*, *Rumex acetosella*, and *Vulpia bromoides* are often present.

Local Environmental Description

Elevation: Mean 552 m, Range 13 – 764 m

Aspect: NE (9), SW (4), SE (2), NW (2), W (1), Flat (1)

Slope: Mean 9 degrees, Range 0 – 40 degrees

Macro Topography: Upper 1/3 of slope (6), Middle 1/3 of slope (4), Lower 1/3 of slope (3), Bottom (2), Middle to Upper 1/3 of slope (1), Ridge top (1)

Large Rock: 0.0%

Small Rock: Mean 0.7%, Range 0.0 – 2.2%

Fines Cover: Mean 7.3%, Range 0.2 – 92.0%

Litter Cover: Mean 14.4%, Range 0.2 – 94%

Soil Texture (field assessed): Coarse, loamy sand (1), Loam, (class unknown) (1), Moderately fine sandy clay loam (1), Not recorded (1)

Geology (field or map data): Sandstone and other sedimentary (11), Sandstone, shale, and conglomerate (4), Volcanic and metavolcanic rocks (2), Sandstone (2),

Alluvium (1)

San Mateo County Watersheds: Pescadero Creek (12), Palo Alto (3), San Mateo Bayside (3), San Gregorio Creek (1), Tunitas Creek (1)

Site Impacts

This alliance has moderate non-native plant cover (average 40.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira caryophylllea*, *Anagallis arvensis*, *Briza minor*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Cirsium vulgare*, *Crepis vesicaria*, *Cynosurus echinatus*, *Erodium botrys*, *Geranium dissectum*, *Hypochaeris radicata*, *Rumex acetosella*, *Sonchus asper*, *Torilis nodosa*, *Vicia sativa*, and *Vulpia bromoides*.

Associations in San Mateo County

- *Bromus carinatus*
- *Elymus glaucus*
- *Pteridium aquilinum* – Grass

Classification Comments

None.

References: Buck and Evens 2010, Buck-Diaz et al. 2011, Buck-Diaz et al. 2012, Buck-Diaz et al. 2013, Buck-Diaz et al. 2020, Evens and Kentner 2006, Klein et al. 2015, Rodriguez et al. 2017

Global Rarity Rank: G3

State Rarity Rank: S3

Surveys Used for Description

Total: N=21; San Mateo County (n=20): CORT063, CORT064, CORT066, CORT068, CORT069, CORT071, CORT073, CORT074, CORT076, CORT099, CORT151, CORT156, CORT157, CORT158, CORT159, PWVNG01A, PWVNG02A, SMAT0261, SMAT0315, SMAT0676

San Francisco County (n=1): YERBA03

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	52.4	35.6	0.5	0.2	3				Y
	<i>Rumex acetosella</i>	90.5	4.2	6.8	0.2	21	Y			Y
Herb	<i>Elymus glaucus</i>	85.7	18.8	32.8	0.2	96	Y			Y
	<i>Bromus carinatus</i>	81.0	11.1	18.5	0.2	68	Y			Y
	<i>Bromus carinatus</i> – <i>Elymus glaucus</i> Herbaceous Alliance									

<i>Bromus hordeaceus</i>	81.0	3.2	5.7	0.2	20	Y	Y
<i>Avena spp.</i>	81.0	4.0	5.2	0.2	19	Y	Y
<i>Vulpia bromoides</i>	76.2	4.2	7.9	0.2	52	Y	Y
<i>Achillea millefolium</i>	76.2	1.9	3.2	0.2	13	Y	Y
<i>Geranium dissectum</i>	71.4	2.5	4.5	0.2	21		Y
<i>Sisyrinchium bellum</i>	66.7	0.5	0.6	0.2	3		Y
<i>Aira caryophylla</i>	61.9	3.2	6.5	0.2	45		Y
<i>Lolium perenne</i>	57.1	6.3	12.4	0.2	80		Y
<i>Bromus diandrus</i>	57.1	1.4	2.5	0.2	35		Y
<i>Madia sativa</i>	52.4	2.2	4.0	0.2	41		Y
<i>Clarkia rubicunda</i>	52.4	1.0	1.8	0.2	16		Y
<i>Vicia sativa</i>	47.6	0.7	1.1	0.2	7		
<i>Sonchus asper</i>	47.6	0.2	0.4	0.2	5		
<i>Sidalcea malviflora</i>	47.6	0.2	0.3	0.2	2		
<i>Cirsium vulgare</i>	42.9	1.2	2.3	0.2	15		
<i>Torilis nodosa</i>	38.1	0.6	1.2	0.2	11		
<i>Carduus pycnocephalus</i>	33.3	0.5	0.6	0.2	5		
<i>Briza minor</i>	33.3	0.3	0.5	0.2	6		
<i>Eschscholzia californica</i>	33.3	0.2	0.3	0.2	2		
<i>Agoseris grandiflora</i>	33.3	0.2	0.3	0.2	3		
<i>Triteleia laxa</i>	33.3	0.1	0.1	0.2	1		
<i>Anagallis arvensis</i>	33.3	0.1	0.1	0.2	0.2		
<i>Erodium botrys</i>	28.6	0.5	0.9	0.2	6		
<i>Clarkia purpurea</i>	28.6	0.4	0.7	0.2	6		
<i>Crepis vesicaria</i>	28.6	0.3	0.6	0.2	5		
<i>Chlorogalum pomeridianum</i>	28.6	0.3	0.5	0.2	5		
<i>Cynosurus echinatus</i>	28.6	0.1	0.1	0.2	1		
<i>Galium aparine</i>	23.8	1.4	2.8	0.2	21		
<i>Ranunculus californicus</i>	23.8	0.4	0.8	0.2	14		
<i>Hypochaeris radicata</i>	23.8	0.1	0.2	0.2	3		
<i>Lupinus bicolor</i>	23.8	0.0	0.0	0.2	0.2		
Non-Vascular							
Moss	57.1	57.1	0.2	0.2	2		Y

***Bromus carinatus* Association**

Common Name: California Brome Mesic Meadow Patches

Alliance: *Bromus carinatus* – *Elymus glaucus* Herbaceous Alliance

Local Vegetation Description

The California Brome Mesic Meadow Association forms an intermittent to open herbaceous layer. The shrub layer is sparse and the tree layer is usually absent. Characteristic herbs include *Achillea millefolium*, *Avena* spp., *Bromus carinatus*, *Bromus diandrus*, *Bromus hordeaceus*, *Elymus glaucus*, *Geranium dissectum*, and *Rumex acetosella*. Those herbs often present include *Aira caryophyllea*, *Anagallis arvensis*, *Carduus pycnocephalus*, *Clarkia rubicunda*, *Eschscholzia californica*, *Lolium perenne*, *Madia sativa*, *Sidalcea malviflora*, *Sisyrinchium bellum*, *Sonchus asper*, *Triteleia laxa*, *Vicia sativa*, and *Vulpia bromoides*, and herbs that are sometimes present include *Agoseris grandiflora*, *Calystegia subacaulis*, *Cirsium vulgare*, *Clarkia purpurea*, *Crepis vesicaria*, *Daucus pusillus*, *Dichelostemma congestum*, *Erodium botrys*, *Erodium cicutarium*, *Hypochaeris radicata*, *Lupinus formosus*, *Plantago erecta*, *Torilis nodosa*, and *Wyethia glabra*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis*, and commonly associated non-vascular plants include Moss.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0.2	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	1.9	0.0 – 6.0	0.3	0 – 0.5
Herb	65.0	55 – 75	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 495 m, Range 13 – 764 m

Aspect: NE (5), Flat (1), SE (1), SW (1)

Slope: Mean 11 degrees, Range 0 – 40 degrees

Macro Topography: Upper 1/3 of slope (3), Lower 1/3 of slope (1), Middle 1/3 of slope (1), Ridge top (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 11.1%, Range 0.2 – 92.0%

Litter Cover: Mean 3.5%, Range 0.2 – 25%

Soil Texture (field assessed): Loam, (class unknown) (1), Not recorded (1)

Geology (field or map data): Sandstone and other sedimentary (6), Volcanic and metavolcanic rocks (2), Alluvium (1)

Bromus carinatus Association
Bromus carinatus – *Elymus glaucus* Herbaceous Alliance

San Mateo County Watersheds: Palo Alto (3), Pescadero Creek (3), San Mateo Bayside (2), Tunitas Creek (1)

Site Impacts

This association has moderate non-native plant cover (average 44.6%) relative to native cover. Non- native species that occur with highest frequency and abundance include *Aira caryophylla*, *Anagallis arvensis*, *Avena* spp., *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Cirsium vulgare*, *Crepis vesicaria*, *Erodium botrys*, *Erodium cicutarium*, *Geranium dissectum*, *Hypochaeris radicata*, *Lolium perenne*, *Rumex acetosella*, *Sonchus asper*, *Torilis nodosa*, *Vicia sativa*, and *Vulpia bromoides*.

Classification Comments

None.

References: Buck and Evens 2010, Buck-Diaz et al. 2011, Buck-Diaz et al. 2013, Klein et al. 2015, Rodriguez et al. 2017

Global Rarity Rank: G3 **State Rarity Rank:** S3 **State Rare:** Y

Surveys Used for Description

Total: N=10; San Mateo County (n=9): CORT063, CORT064, CORT066, CORT068, CORT069, CORT071, PWVNG01A, PWVNG02A, SMAT0676

San Francisco County (n=1): YERBA03

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	60.0	34.8	0.9	0.2	3				Y
	<i>Rubus ursinus</i>	30.0	7.7	0.2	0.2	2				
	<i>Toxicodendron diversilobum</i>	30.0	6.2	0.1	0.2	1				
Herb	<i>Bromus carinatus</i>	90.0	19.7	31.6	10	68				Y
	<i>Avena</i> spp.	90.0	6.8	7.8	1	19				Y
	<i>Bromus diandrus</i>	90.0	2.8	5.0	0.2	35				Y
	<i>Achillea millefolium</i>	90.0	2.0	2.8	0.2	10				Y
	<i>Bromus hordeaceus</i>	80.0	3.7	6.4	0.2	20				Y
	<i>Rumex acetosella</i>	80.0	2.7	4.1	0.2	21				Y
	<i>Geranium dissectum</i>	80.0	2.3	4.0	0.2	15				Y
	<i>Elymus glaucus</i>	80.0	2.1	3.1	0.2	16				Y

Bromus carinatus Association
Bromus carinatus – *Elymus glaucus* Herbaceous Alliance

<i>Madia sativa</i>	70.0	3.6	6.3	0.2	41		Y
<i>Vulpia bromoides</i>	70.0	1.3	2.2	0.2	8		Y
<i>Sonchus asper</i>	70.0	0.2	0.3	0.2	1		Y
<i>Lolium perenne</i>	60.0	9.5	18.5	0.2	80		Y
<i>Clarkia rubicunda</i>	60.0	1.6	2.7	1	16		Y
<i>Vicia sativa</i>	60.0	1.1	1.8	0.2	7		Y
<i>Sisyrinchium bellum</i>	60.0	0.8	0.7	0.2	3		Y
<i>Carduus pycnocephalus</i>	50.0	1.0	1.1	0.2	5		Y
<i>Aira caryophylla</i>	50.0	0.5	0.8	0.2	3		Y
<i>Sidalcea malviflora</i>	50.0	0.2	0.3	0.2	2		Y
<i>Eschscholzia californica</i>	50.0	0.2	0.4	0.2	2		Y
<i>Anagallis arvensis</i>	50.0	0.1	0.1	0.2	0.2		Y
<i>Triteleia laxa</i>	50.0	0.1	0.1	0.2	0.2		Y
<i>Erodium botrys</i>	40.0	0.9	1.6	2	6		
<i>Clarkia purpurea</i>	40.0	0.6	1.1	0.2	6		
<i>Crepis vesicaria</i>	40.0	0.5	0.8	0.2	5		
<i>Agoseris grandiflora</i>	40.0	0.2	0.4	0.2	3		
<i>Plantago erecta</i>	40.0	0.2	0.3	0.2	2		
<i>Calystegia subacaulis</i>	30.0	2.3	1.3	0.2	10		
<i>Cirsium vulgare</i>	30.0	1.2	2.3	0.2	15		
<i>Daucus pusillus</i>	30.0	0.8	0.4	0.2	3		
<i>Torilis nodosa</i>	30.0	0.7	1.2	0.2	11		
<i>Wyethia glabra</i>	30.0	0.2	0.3	0.2	2		
<i>Hypochaeris radicata</i>	30.0	0.1	0.1	0.2	1		
<i>Lupinus formosus</i>	30.0	0.1	0.1	0.2	1		
<i>Erodium cicutarium</i>	30.0	0.1	0.1	0.2	0.2		
<i>Dichelostemma congestum</i>	30.0	0.1	0.1	0.2	0.2		
Non-Vascular							
Moss	80.0	80.0	0.3	0.2	2	Y	Y

***Elymus glaucus* Association**

Common Name: Blue Wildrye Patches

Alliance: *Bromus carinatus* – *Elymus glaucus* Herbaceous Alliance

Local Vegetation Description

The Blue Wildrye Association forms a continuous herbaceous layer. The shrub layer is sparse, and the tree layer is absent. Dominant herbs include *Elymus glaucus*, and characteristic herbs include *Aira caryophyllea*, *Avena* spp., *Bromus carinatus*, *Bromus hordeaceus*, *Geranium dissectum*, *Rumex acetosella*, *Sisyrinchium bellum*, and *Vulpia bromoides*. Those herbs often present include *Achillea millefolium*, *Briza minor*, *Cirsium vulgare*, *Clarkia rubicunda*, *Lolium perenne*, *Sidalcea malviflora*, and *Torilis nodosa*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis*, and commonly associated non-vascular plants include Moss.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.2	0.0 – 0.4	no data	no data
Herb	89.0	75 – 98	no data	no data

Local Environmental Description

Elevation: Mean 650 m, Range 212 – 750 m

Aspect: NE (4), NW (2), SE (1), SW (1), W (1)

Slope: Mean 6 degrees, Range 2 – 15 degrees

Macro Topography: Upper 1/3 of slope (3), Bottom (2), Lower 1/3 of slope (2), Middle 1/3 of slope (2)

Large Rock: no data

Small Rock: no data

Fines Cover: 0.2%

Litter Cover: 0.2%

Soil Texture (field assessed): no data

Geology (field or map data): Sandstone and other sedimentary (5), Sandstone, shale, and conglomerate (4)

San Mateo County Watersheds: Pescadero Creek (7), San Gregorio Creek (1), San Mateo Bayside (1)

Site Impacts

This association has moderate non-native plant cover (average 41.5%) relative to native

Elymus glaucus Association
Bromus carinatus – *Elymus glaucus* Herbaceous Alliance

cover. Non- native species that occur with highest frequency and abundance include *Agrostis stolonifera*, *Aira caryophylla*, *Avena* spp., *Briza minor*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Centaurea solstitialis*, *Cirsium vulgare*, *Conium maculatum*, *Crepis capillaris*, *Cynosurus echinatus*, *Geranium dissectum*, *Holcus lanatus*, *Hypochaeris radicata*, *Lolium perenne*, *Rumex acetosella*, *Rumex crispus*, *Sonchus asper*, *Torilis nodosa*, *Vicia sativa*, and *Vulpia bromoides*.

Classification Comments

None.

References: Buck-Diaz et al. 2012, Klein et al. 2015

Global Rarity Rank: G3 **State Rarity Rank:** S3 **State Rare:** Y

Surveys Used for Description

Total: N=9; San Mateo County (n=9): CORT073, CORT074, CORT076, CORT099, CORT151, CORT156, CORT157, CORT158, CORT159

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	44.4	38.9	0.1	0.2	0.2				
Herb	<i>Elymus glaucus</i>	100.0	41.5	73.1	35	96			Y	Y
	<i>Rumex acetosella</i>	100.0	5.0	9.4	1	20				Y
	<i>Bromus hordeaceus</i>	100.0	3.4	6.1	2	16				Y
	<i>Vulpia bromoides</i>	88.9	8.0	15.7	0.2	52				Y
	<i>Bromus carinatus</i>	88.9	4.1	8.1	0.2	20				Y
	<i>Sisyrinchium bellum</i>	88.9	0.2	0.5	0.2	2				Y
	<i>Aira caryophylla</i>	77.8	6.8	14.1	1	45				Y
	<i>Geranium dissectum</i>	77.8	3.3	6.0	3	21				Y
	<i>Avena</i> spp.	77.8	1.8	3.6	1	8				Y
	<i>Lolium perenne</i>	66.7	4.1	8.4	1	27				Y
	<i>Achillea millefolium</i>	66.7	2.3	4.4	0.2	13				Y
	<i>Cirsium vulgare</i>	66.7	1.4	2.7	0.2	10				Y
	<i>Torilis nodosa</i>	55.6	0.7	1.3	1	6				Y
	<i>Clarkia rubicunda</i>	55.6	0.6	1.1	0.2	5				Y
	<i>Briza minor</i>	55.6	0.6	1.1	0.2	6				Y
	<i>Sidalcea malviflora</i>	55.6	0.1	0.3	0.2	1				Y
	<i>Madia sativa</i>	44.4	1.1	2.2	0.2	17				
<i>Vicia sativa</i>	44.4	0.3	0.6	0.2	4					
<i>Agrostis stolonifera</i>	33.3	3.1	6.4	13	28					
<i>Galium aparine</i>	33.3	2.4	4.8	3	21					

Elymus glaucus Association
Bromus carinatus – *Elymus glaucus* Herbaceous Alliance

<i>Festuca idahoensis</i>	33.3	1.8	3.7	7	16
<i>Sonchus asper</i>	33.3	0.3	0.6	0.2	5
<i>Chlorogalum pomeridianum</i>	33.3	0.2	0.4	0.2	3
<i>Rumex crispus</i>	33.3	0.2	0.3	0.2	2
<i>Agoseris grandiflora</i>	33.3	0.1	0.2	0.2	1
<i>Conium maculatum</i>	33.3	0.1	0.2	0.2	1
<i>Lupinus bicolor</i>	33.3	0.0	0.1	0.2	0.2
<i>Cynosurus echinatus</i>	33.3	0.0	0.1	0.2	0.2
<i>Ranunculus californicus</i>	33.3	0.0	0.1	0.2	0.2
<i>Cyperus spp.</i>	22.2	0.5	0.9	3	5
<i>Crepis vesicaria</i>	22.2	0.2	0.4	1	3
<i>Erodium botrys</i>	22.2	0.2	0.4	0.2	3
<i>Hypochaeris radicata</i>	22.2	0.2	0.4	0.2	3
<i>Centaurea solstitialis</i>	22.2	0.2	0.3	1	2
<i>Clarkia purpurea</i>	22.2	0.2	0.3	1	2
<i>Bromus diandrus</i>	22.2	0.1	0.2	0.2	2
<i>Eschscholzia californica</i>	22.2	0.1	0.2	0.2	2
<i>Crepis capillaris</i>	22.2	0.1	0.1	0.2	1
<i>Triteleia laxa</i>	22.2	0.1	0.1	0.2	1
<i>Carduus pycnocephalus</i>	22.2	0.0	0.0	0.2	0.2
<i>Elymus multisetus</i>	22.2	0.0	0.0	0.2	0.2
<i>Pseudognaphalium californicum</i>	22.2	0.0	0.0	0.2	0.2
<i>Lactuca serriola</i>	22.2	0.0	0.0	0.2	0.2
Non-Vascular					
Moss	44.4	44.4	0.1	0.2	0.2

***Pteridium aquilinum* – Grass Association**

Common Name: Bracken Fern – Grass Patches

Alliance: *Bromus carinatus* – *Elymus glaucus* Herbaceous Alliance

Local Vegetation Description

The Bracken Fern – Grass Association forms a continuous herbaceous layer. The shrub layer is sparse and the tree layer is absent. Dominant herbs include *Pteridium aquilinum*. Those herbs often present include *Achillea millefolium*, *Avena* spp., *Brachypodium distachyon*, and *Briza maxima*, and herbs that are sometimes present include *Aira caryophylllea*, *Anagallis arvensis*, *Bromus carinatus*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Chlorogalum pomeridianum*, *Clarkia purpurea*, *Cynosurus echinatus*, *Dichelostemma capitatum*, *Dichelostemma congestum*, *Elymus glaucus*, *Erodium botrys*, *Eschscholzia californica*, *Hypochaeris glabra*, *Hypochaeris radicata*, *Iris macrosiphon*, *Lolium perenne*, *Lupinus bicolor*, *Nassella pulchra*, *Plantago lanceolata*, *Rumex acetosella*, *Sisyrinchium bellum*, *Trifolium willdenovii*, *Triteleia laxa*, and *Vulpia bromoides*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	1.0	0.0 – 2.0	0.3	0 – 0.5
Herb	81.5	78 – 85	0.9	0 – 2

Local Environmental Description

Elevation: Mean 396 m, Range 39 – 753 m

Aspect: SW (2)

Slope: Mean 8 degrees, Range 8 – 8 degrees

Macro Topography: Middle 1/3 of slope (1), Middle to Upper 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: Mean 1.3%, Range 0.4 – 2.2%

Fines Cover: Mean 4.0%, Range 1.0 – 7.0%

Litter Cover: Mean 92.0%, Range 90.0 – 94%

Soil Texture (field assessed): Coarse, loamy sand (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Sandstone (2)

San Mateo County Watersheds: Pescadero Creek (2)

Site Impacts

Pteridium aquilinum – Grass Association
Bromus carinatus – *Elymus glaucus* Herbaceous Alliance

This association has low non-native plant cover (average 11.6%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira caryophylla*, *Anagallis arvensis*, *Avena* spp., *Brachypodium distachyon*, *Briza maxima*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Cynosurus echinatus*, *Erodium botrys*, *Hypochaeris glabra*, *Hypochaeris radicata*, *Lolium perenne*, *Plantago lanceolata*, *Rumex acetosella*, and *Vulpia bromoides*.

Classification Comments

None.

References: Buck and Evens 2010, Buck-Diaz et al. 2020, Klein et al. 2015, Rodriguez et al. 2017

Global Rarity Rank: G3 **State Rarity Rank:** S3 **State Rare:** Y

Surveys Used for Description

Total: N=2; San Mateo County (n=2): SMAT0261, SMAT0315

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	50.0	25.0	0.5	1	1				Y
	<i>Frangula californica</i>	50.0	25.0	0.5	1	1				Y
Herb	<i>Pteridium aquilinum</i>	100.0	72.1	72.5	70	75		Y		Y
	<i>Rumex acetosella</i>	100.0	8.3	8.5	7	10				Y
	<i>Fragaria vesca</i>	50.0	6.8	7.5	15	15				Y
	<i>Clinopodium douglasii</i>	50.0	4.5	5.0	10	10				Y
	<i>Madia gracilis</i>	50.0	2.7	2.5	5	5				Y
	<i>Vulpia bromoides</i>	50.0	1.6	1.5	3	3				Y
	<i>Torilis arvensis</i>	50.0	0.5	0.5	1	1				Y
	<i>Polystichum munitum</i>	50.0	0.5	0.5	1	1				Y
	<i>Chlorogalum pomeridianum</i>	50.0	0.5	0.5	1	1				Y
	<i>Holcus lanatus</i>	50.0	0.5	0.5	1	1				Y
	<i>Pentagramma triangularis</i>	50.0	0.5	0.5	1	1				Y
	<i>Pseudognaphalium californicum</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Lotus micranthus</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Hypochaeris glabra</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Lupinus bicolor</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Bromus diandrus</i>	50.0	0.1	0.1	0.2	0.2				Y

Pteridium aquilinum – Grass Association
Bromus carinatus – *Elymus glaucus* Herbaceous Alliance

<i>Elymus glaucus</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Cynosurus echinatus</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Avena spp.</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Potentilla glandulosa</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Achillea millefolium</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Anagallis arvensis</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Plantago lanceolata</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Aira caryophyllea</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Nassella lepida</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Briza maxima</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Pseudognaphalium stramineum</i>	50.0	0.1	0.1	0.2	0.2	Y

***Cakile (edentula, maritima)* Herbaceous Provisional Semi-Natural Alliance**



Common Name: Sea rocket sands

NVC Alliance Code: N/A.

Statewide Description

Cakile edentula or *Cakile maritima* is dominant in the herbaceous layer.

The National Vegetation Classification (NatureServe 2007a) recognizes a sparsely vegetated alliance in the United States and in Europe. *C. edentula* and *C. maritima* are not natives in California, and they are two of a very short list of species that thrive along the leading edge of the beach. Both species have similar reproductive output, but *C. maritima* has higher survivorship and more seed output on nearshore dunes, where it might live for several years. *C. maritima* is replacing *C. edentula* at southern beaches of California, whereas the more severe winter conditions at northern areas allow for their coexistence (Boyd and Barbour 1993). *Layia carnosa* and *Abronia umbellata* ssp. *breviflora* (CNPS list 1B.1 plants) grow with these species on upper beaches and landward edges of the nearshore dunes.

Local Vegetation Description

The Sea rocket sands Alliance forms an open herbaceous layer. The shrub layer is absent and the tree layer is sparse to absent. Dominant herbs include *Cakile maritima*, and characteristic herbs include *Ambrosia chamissonis* and *Elymus mollis*. Those herbs often present include *Ammophila arenaria*, *Atriplex prostrata*, and *Tetragonia*

Cakile (edentula, maritima) Herbaceous Provisional Semi-Natural Alliance

tetragonioides. Commonly associated regenerating or shrubby trees at sparse cover include *Umbellularia californica*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.1	0 – 0.2	0.3	0 – 0.5
Shrub	0.0	0 – 0	no data	no data
Herb	13.0	11 – 15	0.3	0 – 0.5

Local Membership Rule

Cakile edentula and/or *C. maritima* are strongly dominant along active beaches at the debris line.

Local Environmental Description

Elevation: Mean 3 m, Range 0 – 5 m

Aspect: Flat (1), SW (1)

Slope: Mean 3 degrees, Range 0 – 5 degrees

Macro Topography: Bottom to Lower 1/3 of slope (1), Bottom (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 92.0%, Range 85 – 99%

Litter Cover: Mean 8.0%, Range 1.0 – 15%

Soil Texture (field assessed): Fine sand (1), Sand, (class unknown) (1)

Geology (field or map data): Sand dunes (2)

San Mateo County Watersheds: San Gregorio Creek (1)

Other Watersheds, Marin Co.: Tomales Bay (1)

Site Impacts

This alliance has greater cover of exotics than natives, non-native plant cover (average 93.8%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Ammophila arenaria*, *Atriplex prostrata*, *Cakile maritima*, and *Tetragonia tetragonioides*.

Associations in San Mateo County

- *Cakile (edentula, maritima)*

Classification Comments

Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: Williams and Potter 1972

Global Rarity Rank: GNA

State Rarity Rank: SNA

Cakile (edentula, maritima) Herbaceous Provisional Semi-Natural Alliance

Surveys Used for Description

Total: N=2; San Mateo County (n=1): SMAT0264

Marin County (n=1): MARIN271

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Regenerating or Shrubby Trees	<i>Umbellularia californica</i>	50.0	50.0	0.1	0.2	0.2				Y
Herb	<i>Cakile maritima</i>	100.0	84.2	11.5	9	14	Y	Y		Y
	<i>Ambrosia chamissonis</i>	100.0	4.1	0.6	0.2	1	Y			Y
	<i>Elymus mollis</i>	100.0	1.5	0.2	0.2	0.2	Y			Y
	<i>Ammophila arenaria</i>	50.0	8.6	1.0	2	2				Y
	<i>Atriplex prostrata</i>	50.0	0.9	0.1	0.2	0.2				Y
	<i>Tetragonia tetragonioides</i>	50.0	0.6	0.1	0.2	0.2				Y

***Cakile (edentula, maritima)* Provisional Semi-natural Association**

Common Name: Sea Rocket Patches

Alliance: *Cakile (edentula, maritima)* Herbaceous Provisional Semi-Natural Alliance

Classification Comments

The association circumscription is the same as that of the alliance for the county. See above for detailed description.

References: Williams and Potter 1972

Global Rarity Rank: GNA

State Rarity Rank: SNA

State Rare: N

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Regenerating or Shrubby Trees	<i>Umbellularia californica</i>	50.0	50.0	0.1	0.2	0.2				Y
	<i>Cakile maritima</i>	100.0	84.2	11.5	9	14		Y		Y
Herb	<i>Ambrosia chamissonis</i>	100.0	4.1	0.6	0.2	1				Y
	<i>Elymus mollis</i>	100.0	1.5	0.2	0.2	0.2				Y
	<i>Ammophila arenaria</i>	50.0	8.6	1.0	2	2				Y
	<i>Atriplex prostrata</i>	50.0	0.9	0.1	0.2	0.2				Y
	<i>Tetragonia tetragonioides</i>	50.0	0.6	0.1	0.2	0.2				Y

***Calamagrostis nutkaensis* Herbaceous Alliance**



Common Name: Pacific reed grass meadows

NVC Alliance Code: A3739. *Festuca rubra* - *Calamagrostis nutkaensis* Exposed Coastal Headland Grassland Alliance

Statewide Description

Calamagrostis nutkaensis is dominant or co-dominant in the herbaceous layer with *Anthoxanthum odoratum*, *Artemisia suksdorfii*, *Elymus glaucus*, *Festuca arundinacea*, *Festuca rubra*, *Heracleum maximum*, *Holcus lanatus*, and *Pteridium aquilinum*. Emergent trees and shrubs may be present at low cover, including *Picea sitchensis*, *Baccharis pilularis*, *Gaultheria shallon*, *Rubus* spp., or *Vaccinium ovatum*.

Often considered part of the coastal prairie (Bartolome 1994, Hektner and Foin 1977), the alliance occupies the coastal terraces and mixes with the *Danthonia californica* and *Deschampsia cespitosa* Alliances at a fine scale. The alliance also occurs in freshwater swales, depressions, and springs, mixed with other wetland herbaceous types. It forms tall grasslands on moist coastal bluffs at the southern extent of its range. On the broad scale, *Calamagrostis nutkaensis* stands mix with forested stands of the *Alnus rubra* and *Picea sitchensis* Alliances, and shrublands of the *Baccharis pilularis*, *Lupinus arboreus*, *Salix hookeriana*, and *Rubus* spp. Alliances.

Local Vegetation Description

The Pacific reed grass meadows Alliance forms an open to continuous herbaceous

Calamagrostis nutkaensis Herbaceous Alliance

layer. The shrub layer is open to intermittent and the tree layer is sparse. Dominant herbs include *Calamagrostis nutkaensis*, and characteristic herbs include *Castilleja affinis*, *Erigeron glaucus*, *Eriophyllum stoechadifolium*, *Polystichum munitum*, and *Pteridium aquilinum*. Those herbs often present include *Agrostis stolonifera*, *Aira caryophyllea*, *Anaphalis margaritacea*, *Chlorogalum pomeridianum*, *Ligusticum apiifolium*, and *Rumex acetosella*. Characteristic shrubs include *Baccharis pilularis*, *Diplacus aurantiacus*, *Rubus ursinus*, *Toxicodendron diversilobum*. *Lupinus versicolor* and *Vaccinium ovatum* are shrubs that are often present. Commonly associated non-vascular plants include Moss.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.2	0 – 1	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	37.3	10 – 64	1.9	0.5 – 5
Herb	59.3	30 – 72	0.8	0.5 – 1

Local Membership Rule

Calamagrostis nutkaensis dominates or co-dominates with *Baccharis pilularis*. Other species such as *Carex obnupta*, *Heracleum maximum*, *Holcus lanatus*, *Juncus* spp., *Pteridium aquilinum*, and/or *Rubus ursinus* often intermix in stands.

Local Environmental Description

Elevation: Mean 193 m, Range 33 – 370 m

Aspect: NE (3), Variable (1), SW (1), Flat (1), NW (1)

Slope: Mean 13 degrees, Range 0 – 25 degrees

Macro Topography: Upper 1/3 of slope (3), Upper 1/3 of slope to Ridgetop (1), Bottom to Lower 1/3 of slope (1), Middle to Upper 1/3 of slope (1), Ridge top (1)

Large Rock: Mean 3.0%, Range 0.0 – 8.0%

Small Rock: Mean 1.3%, Range 0.0 – 2.0%

Fines Cover: Mean 16.7%, Range 0.2 – 83.0%

Litter Cover: Mean 36.6%, Range 0.2 – 89%

Soil Texture (field assessed): Medium to very fine, loamy sand (2), Medium to very fine, sandy loam (1)

Geology (field or map data): Sandstone, shale, and conglomerate (6), Mixed sedimentary (1), Sandstone (1)

San Mateo County Watersheds: Pacifica (4), San Mateo Bayside (3), Ano Nuevo (1)

Site Impacts

This alliance has low non-native plant cover (average 3.6%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Agrostis stolonifera*, *Aira caryophyllea*, *Rumex acetosella*, and *Vulpia myuros*.

Associations in San Mateo County

- *Calamagrostis nutkaensis*
- *Calamagrostis nutkaensis* / *Baccharis pilularis*

Classification Comments

None.

References: Buck-Diaz et al. 2020, Hektner and Foin 1977, Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: G4

State Rarity Rank: S2

Surveys Used for Description

Total: N=8; San Mateo County (n=8): CORT080, CORT082, CORT166, CORT167, CPRAIR00, SMAT0179, SMAT0666, SMAT0677

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Rubus ursinus</i>	100.0	20.7	9.4	1	26	Y			Y
	<i>Toxicodendron diversilobum</i>	100.0	12.0	8.1	0.5	33	Y			Y
	<i>Baccharis pilularis</i>	87.5	42.0	16.9	8.5	36	Y		Y	Y
	<i>Diplacus aurantiacus</i>	75.0	3.0	1.0	0.2	4	Y			Y
	<i>Vaccinium ovatum</i>	50.0	4.6	0.9	0.2	6				Y
	<i>Lupinus versicolor</i>	50.0	0.7	0.1	0.2	0.5				Y
	<i>Frangula californica</i>	37.5	7.4	4.5	1	25				
	<i>Ceanothus thyrsiflorus</i>	37.5	1.1	0.8	0.2	4				
	<i>Symphoricarpos albus</i>	25.0	1.7	0.7	0.2	5				
	<i>Holodiscus discolor</i>	25.0	0.5	0.5	0.2	4				
	<i>Oemleria cerasiformis</i>	25.0	0.3	0.3	0.2	2				
	<i>Lonicera hispidula</i>	25.0	0.3	0.2	0.2	1				
	<i>Artemisia californica</i>	25.0	0.1	0.1	0.2	0.2				
Herb	<i>Calamagrostis nutkaensis</i>	100.0	57.1	48.9	20	81	Y	Y		Y
	<i>Pteridium aquilinum</i>	100.0	6.0	5.0	0.2	13	Y			Y
	<i>Polystichum munitum</i>	100.0	2.3	2.2	0.2	9	Y			Y
	<i>Eriophyllum stoechadifolium</i>	87.5	2.5	2.2	0.2	6	Y			Y
	<i>Erigeron glaucus</i>	75.0	2.3	1.9	0.2	7	Y			Y
	<i>Castilleja affinis</i>	75.0	1.2	1.4	0.2	7	Y			Y

Calamagrostis nutkaensis Herbaceous Alliance

<i>Aira caryophyllea</i>	62.5	2.6	2.7	0.2	15	Y
<i>Anaphalis margaritacea</i>	62.5	1.2	1.4	0.2	9	Y
<i>Rumex acetosella</i>	62.5	1.1	0.9	0.2	2	Y
<i>Chlorogalum pomeridianum</i>	62.5	0.7	0.6	0.2	2	Y
<i>Agrostis stolonifera</i>	50.0	0.5	0.5	0.2	3	Y
<i>Ligusticum apiifolium</i>	50.0	0.3	0.3	0.2	2	Y
<i>Festuca californica</i>	37.5	4.7	3.6	0.5	23	
<i>Polypodium californicum</i>	37.5	1.2	1.3	0.5	9	
<i>Achillea millefolium</i>	37.5	0.8	0.8	0.2	4	
<i>Stachys bullata</i>	37.5	1.0	0.7	0.5	4	
<i>Eriogonum latifolium</i>	37.5	0.5	0.4	0.5	2	
<i>Iris douglasiana</i>	37.5	0.4	0.3	0.5	1.2	
<i>Sedum spathulifolium</i>	37.5	0.4	0.3	0.2	1	
<i>Gnaphalium spp.</i>	37.5	0.1	0.2	0.2	1	
<i>Scrophularia californica</i>	37.5	0.2	0.2	0.2	1	
<i>Angelica hendersonii</i>	37.5	0.1	0.1	0.2	0.2	
<i>Triteleia laxa</i>	37.5	0.1	0.1	0.2	0.2	
<i>Festuca rubra</i>	25.0	2.6	2.7	0.2	21	
<i>Clinopodium douglasii</i>	25.0	0.6	0.9	0.2	7	
<i>Monardella undulata</i>	25.0	0.5	0.5	2	2	
<i>Monardella villosa</i>	25.0	0.2	0.3	0.2	2	
<i>Symphotrichum chilense</i>	25.0	0.2	0.3	0.2	2	
<i>Plantago spp.</i>	25.0	0.3	0.3	0.2	2	
<i>Lathyrus vestitus</i>	25.0	0.1	0.2	0.2	1.2	
<i>Heterotheca sessiliflora</i>	25.0	0.1	0.2	0.2	1	
<i>Fragaria vesca</i>	25.0	0.1	0.2	0.2	1	
<i>Sisyrinchium bellum</i>	25.0	0.2	0.2	0.2	1	
<i>Heracleum maximum</i>	25.0	0.4	0.2	0.2	1	
<i>Elymus glaucus</i>	25.0	0.1	0.2	0.2	1	
<i>Agrostis hallii</i>	25.0	0.1	0.1	0.2	0.5	
<i>Horkelia marinensis</i>	25.0	0.0	0.1	0.2	0.2	
<i>Gamochaeta ustulata</i>	25.0	0.1	0.1	0.2	0.2	
<i>Pseudognaphalium canescens ssp. beneolens</i>	25.0	0.0	0.1	0.2	0.2	
<i>Galium aparine</i>	25.0	0.1	0.1	0.2	0.2	
<i>Vulpia myuros</i>	25.0	0.1	0.1	0.2	0.2	
Non-Vascular						
Moss	50.0	50.0	0.1	0.2	0.2	Y

***Calamagrostis nutkaensis* Association**

Common Name: Pacific reed grass association Patches

Alliance: *Calamagrostis nutkaensis* Herbaceous Alliance

Local Vegetation Description

The Pacific reed grass association Association forms an intermittent to continuous herbaceous layer. The shrub layer is open and the tree layer is absent. Dominant herbs include *Calamagrostis nutkaensis*, and characteristic herbs include *Achillea millefolium* and *Pteridium aquilinum*. Those herbs often present include *Aira caryophyllea*, *Angelica hendersonii*, *Dudleya farinosa*, *Erigeron glaucus*, *Eriophyllum stoechadifolium*, *Hypochaeris radicata*, *Iris douglasiana*, *Plantago lanceolata*, *Rumex acetosella*, *Sedum spathulifolium*, and *Stachys ajugoides*, and herbs that are sometimes present include *Agrostis stolonifera*, *Anaphalis margaritacea*, *Briza maxima*, *Bromus diandrus*, *Castilleja* spp., *Castilleja affinis*, *Chlorogalum pomeridianum*, *Deschampsia cespitosa*, *Eriogonum latifolium*, *Eryngium armatum*, *Erysimum*, *Fragaria chiloensis*, *Gamochaeta ustulata*, *Gnaphalium*, *Holcus lanatus*, *Phacelia californica*, *Polypodium scouleri*, *Polystichum munitum*, *Vulpia bromoides*, and *Vulpia myuros*. Commonly associated emergent shrubs at sparse cover include *Vaccinium ovatum*, *Gaultheria shallon*, and *Rubus ursinus*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	9.3	0.0 – 18.0	0.3	0 – 0.5
Herb	82.7	65 – 98	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 149 m, Range 28 – 328 m

Aspect: SW (1)

Slope: Mean 25 degrees, Range 25 – 25 degrees

Macro Topography: Ridge top (1)

Large Rock: no data

Small Rock: no data

Fines Cover: 2.0%

Litter Cover: 0.2%

Soil Texture (field assessed): no data

Geology (field or map data): Sandstone, shale, and conglomerate (3), Sandstone and other sedimentary (1)

Calamagrostis nutkaensis Association
Calamagrostis nutkaensis Herbaceous Alliance

San Mateo County Watersheds: San Mateo Bayside (1)

Other Watersheds, Marin Co.: Point Reyes (3)

Site Impacts

This association has moderate non-native plant cover (average 25.0%) relative to native cover. Non- native species that occur with highest frequency and abundance include *Agrostis stolonifera*, *Aira caryophyllea*, *Briza maxima*, *Bromus diandrus*, *Holcus lanatus*, *Hypochaeris radicata*, *Plantago lanceolata*, *Rumex acetosella*, *Vulpia bromoides*, and *Vulpia myuros*.

Classification Comments

Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Hektner and Foin 1977

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=4; San Mateo County (n=1): CORT080

Marin County (n=3): PGA207, PGA493, PGA501

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Vaccinium ovatum</i>	75.0	26.8	5.3	0.2	15				Y
	<i>Gaultheria shallon</i>	50.0	24.4	1.5	1	5				Y
	<i>Rubus ursinus</i>	50.0	16.9	3.5	4	10				Y
	<i>Diplacus aurantiacus</i>	25.0	2.4	0.5	2	2				
	<i>Arctostaphylos imbricata</i>	25.0	2.4	0.5	2	2				
	<i>Toxicodendron diversilobum</i>	25.0	1.2	0.3	1	1				
	<i>Lupinus arboreus</i>	25.0	0.9	0.1	0.2	0.2				
Herb	<i>Calamagrostis nutkaensis</i>	100.0	50.0	36.3	20	55		Y		Y
	<i>Pteridium aquilinum</i>	75.0	2.0	1.8	0.2	5				Y
	<i>Achillea millefolium</i>	75.0	0.9	0.6	0.2	2				Y
	<i>Eriophyllum stoechadifolium</i>	50.0	5.4	3.0	5	7				Y

Calamagrostis nutkaensis Association
Calamagrostis nutkaensis Herbaceous Alliance

<i>Hypochaeris radicata</i>	50.0	3.8	3.6	0.2	14	Y
<i>Iris douglasiana</i>	50.0	3.4	2.3	4	5	Y
<i>Erigeron glaucus</i>	50.0	2.7	1.8	0.2	7	Y
<i>Sedum spathulifolium</i>	50.0	1.9	1.0	1	3	Y
<i>Plantago lanceolata</i>	50.0	1.7	1.6	0.2	6	Y
<i>Dudleya farinosa</i>	50.0	1.6	0.8	0.2	3	Y
<i>Aira caryophyllea</i>	50.0	1.5	1.1	0.2	4	Y
<i>Rumex acetosella</i>	50.0	0.8	0.6	0.2	2	Y
<i>Angelica hendersonii</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Stachys ajugoides</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Holcus lanatus</i>	25.0	10.8	10.0	40	40	
<i>Briza maxima</i>	25.0	8.4	7.5	30	30	
<i>Polypodium scolieri</i>	25.0	2.6	1.3	5	5	
<i>Eryngium armatum</i>	25.0	0.8	0.8	3	3	
<i>Eriogonum latifolium</i>	25.0	0.4	0.3	1	1	
<i>Phacelia californica</i>	25.0	0.1	0.1	0.2	0.2	
<i>Gamochaeta ustulata</i>	25.0	0.1	0.1	0.2	0.2	
<i>Castilleja spp.</i>	25.0	0.1	0.1	0.2	0.2	
<i>Deschampsia cespitosa</i>	25.0	0.1	0.1	0.2	0.2	
<i>Gnaphalium spp.</i>	25.0	0.1	0.1	0.2	0.2	
<i>Polystichum munitum</i>	25.0	0.1	0.1	0.2	0.2	
<i>Anaphalis margaritacea</i>	25.0	0.1	0.1	0.2	0.2	
<i>Agrostis stolonifera</i>	25.0	0.1	0.1	0.2	0.2	
<i>Castilleja affinis</i>	25.0	0.1	0.1	0.2	0.2	
<i>Vulpia myuros</i>	25.0	0.1	0.1	0.2	0.2	
<i>Fragaria chiloensis</i>	25.0	0.1	0.1	0.2	0.2	
<i>Erysimum spp.</i>	25.0	0.1	0.1	0.2	0.2	
<i>Bromus diandrus</i>	25.0	0.1	0.1	0.2	0.2	
<i>Vulpia bromoides</i>	25.0	0.1	0.1	0.2	0.2	
<i>Chlorogalum pomeridianum</i>	25.0	0.1	0.1	0.2	0.2	
<i>Forb (herbaceous, not grass nor grasslike)</i>	25.0	0.1	0.1	0.2	0.2	
Non-Vascular						
Moss	25.0	25.0	0.1	0.2	0.2	

***Calamagrostis nutkaensis* / *Baccharis pilularis* Association**

Common Name: Pacific Reedgrass – Coyote Brush Patches

Alliance: *Calamagrostis nutkaensis* Herbaceous Alliance

Local Vegetation Description

The Pacific Reedgrass – Coyote Brush Association forms an open to continuous herbaceous layer. The shrub layer is open to continuous and the tree layer is usually absent. Dominant herbs include *Calamagrostis nutkaensis*, and characteristic herbs include *Eriophyllum stoechadifolium*, *Polystichum munitum*, and *Pteridium aquilinum*. Those herbs often present include *Aira caryophyllea*, *Anaphalis margaritacea*, *Castilleja affinis*, *Chlorogalum pomeridianum*, *Erigeron glaucus*, *Ligusticum apiifolium*, and *Rumex acetosella*, and herbs that are sometimes present include *Achillea millefolium*, *Agrostis hallii*, *Agrostis stolonifera*, *Angelica hendersonii*, *Clinopodium douglasii*, *Elymus glaucus*, *Eriogonum latifolium*, *Festuca californica*, *Festuca rubra*, *Fragaria vesca*, *Galium aparine*, *Gamochaeta ustulata*, *Gnaphalium* spp., *Heracleum maximum*, *Heterotheca sessiliflora*, *Horkelia marinensis*, *Iris douglasiana*, *Lathyrus vestitus*, *Monardella undulata*, *Monardella villosa*, *Plantago* spp., *Polypodium californicum*, *Pseudognaphalium canescens* ssp. *beneolens*, *Scrophularia californica*, *Sedum spathulifolium*, *Sisyrinchium bellum*, *Stachys bullata*, *Symphotrichum chilense*, and *Triteleia laxa*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis*, *Rubus ursinus*, *Toxicodendron diversilobum*, *Diplacus aurantiacus*, and *Lupinus versicolor*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.2	0 – 1	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	45.8	10 – 80	1.9	0.5 – 5
Herb	63.4	30 – 80	0.8	0.5 – 1

Local Environmental Description

Elevation: Mean 174 m, Range 33 – 370 m

Aspect: NE (3), Variable (1), NW (1), Flat (1)

Slope: Mean 11 degrees, Range 0 – 25 degrees

Macro Topography: Upper 1/3 of slope (3), Middle to Upper 1/3 of slope (1), Bottom to Lower 1/3 of slope (1), Upper 1/3 of slope to Ridgetop (1)

Large Rock: Mean 3.0%, Range 0.0 – 8.0%

Small Rock: Mean 1.3%, Range 0.0 – 2.0%

Fines Cover: Mean 19.7%, Range 0.2 – 83.0%

Litter Cover: Mean 43.8%, Range 0.2 – 89%

Calamagrostis nutkaensis / *Baccharis pilularis* Association
Calamagrostis nutkaensis Herbaceous Alliance

Soil Texture (field assessed): Medium to very fine, loamy sand (2), Medium to very fine, sandy loam (1)

Geology (field or map data): Sandstone, shale, and conglomerate (5), Sandstone (1), Mixed sedimentary (1)

San Mateo County Watersheds: Pacifica (4), San Mateo Bayside (2), Ano Nuevo (1)

Site Impacts

This association has low non-native plant cover (average 3.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Agrostis stolonifera*, *Aira caryophyllea*, and *Rumex acetosella*.

Classification Comments

None.

References: Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: G2

State Rarity Rank: S1.2

State Rare: Y

Surveys Used for Description

Total: N=7; San Mateo County (n=7): CORT082, CORT166, CORT167, CPRAIR00, SMAT0179, SMAT0666, SMAT0677

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	100.0	48.0	19.4	8.5	36			Y	Y
	<i>Rubus ursinus</i>	100.0	16.9	9.3	1	26				Y
	<i>Toxicodendron diversilobum</i>	100.0	13.0	9.1	0.5	33				Y
	<i>Diplacus aurantiacus</i>	71.4	2.1	0.8	0.2	4				Y
	<i>Lupinus versicolor</i>	57.1	0.8	0.2	0.2	0.5				Y
	<i>Frangula californica</i>	42.9	8.4	5.1	1	25				
	<i>Ceanothus thyrsiflorus</i>	42.9	1.3	0.9	0.2	4				
	<i>Vaccinium ovatum</i>	42.9	1.2	0.2	0.2	1				
	<i>Symphoricarpos albus</i>	28.6	2.0	0.7	0.2	5				
	<i>Holodiscus discolor</i>	28.6	0.6	0.6	0.2	4				
	<i>Lonicera hispidula</i>	28.6	0.3	0.2	0.2	1				
	<i>Oemleria cerasiformis</i>	28.6	0.3	0.3	0.2	2				
	<i>Artemisia californica</i>	28.6	0.2	0.1	0.2	0.2				

Herb

Calamagrostis nutkaensis / *Baccharis pilularis* Association
Calamagrostis nutkaensis Herbaceous Alliance

<i>Calamagrostis nutkaensis</i>	100.0	55.8	49.4	20	81	Y	Y
<i>Pteridium aquilinum</i>	100.0	6.8	5.6	0.2	13		Y
<i>Polystichum munitum</i>	100.0	2.5	2.5	0.2	9		Y
<i>Eriophyllum stoechadifolium</i>	85.7	1.9	1.8	0.2	6		Y
<i>Castilleja affinis</i>	71.4	1.3	1.5	0.2	7		Y
<i>Erigeron glaucus</i>	71.4	1.1	1.2	0.2	6		Y
<i>Chlorogalum pomeridianum</i>	71.4	0.8	0.7	0.2	2		Y
<i>Aira caryophyllea</i>	57.1	2.1	2.5	0.2	15		Y
<i>Anaphalis margaritacea</i>	57.1	1.3	1.6	0.2	9		Y
<i>Rumex acetosella</i>	57.1	0.9	0.7	0.2	2		Y
<i>Ligusticum apiifolium</i>	57.1	0.4	0.4	0.2	2		Y
<i>Festuca californica</i>	42.9	5.4	4.1	0.5	23		
<i>Polypodium californicum</i>	42.9	1.4	1.5	0.5	9		
<i>Stachys bullata</i>	42.9	1.1	0.8	0.5	4		
<i>Agrostis stolonifera</i>	42.9	0.5	0.5	0.2	3		
<i>Iris douglasiana</i>	42.9	0.4	0.4	0.5	1.2		
<i>Scrophularia californica</i>	42.9	0.2	0.2	0.2	1		
<i>Triteleia laxa</i>	42.9	0.1	0.1	0.2	0.2		
<i>Angelica hendersonii</i>	42.9	0.1	0.1	0.2	0.2		
<i>Festuca rubra</i>	28.6	3.0	3.0	0.2	21		
<i>Clinopodium douglasii</i>	28.6	0.7	1.0	0.2	7		
<i>Monardella undulata</i>	28.6	0.6	0.6	2	2		
<i>Achillea millefolium</i>	28.6	0.5	0.6	0.2	4		
<i>Heracleum maximum</i>	28.6	0.5	0.2	0.2	1		
<i>Eriogonum latifolium</i>	28.6	0.3	0.4	0.5	2		
<i>Plantago spp.</i>	28.6	0.3	0.3	0.2	2		
<i>Sedum spathulifolium</i>	28.6	0.2	0.2	0.2	1		
<i>Monardella villosa</i>	28.6	0.2	0.3	0.2	2		
<i>Symphotrichum chilense</i>	28.6	0.2	0.3	0.2	2		
<i>Sisyrinchium bellum</i>	28.6	0.2	0.2	0.2	1		
<i>Elymus glaucus</i>	28.6	0.2	0.2	0.2	1		
<i>Lathyrus vestitus</i>	28.6	0.2	0.2	0.2	1.2		
<i>Heterotheca sessiliflora</i>	28.6	0.2	0.2	0.2	1		
<i>Agrostis hallii</i>	28.6	0.2	0.1	0.2	0.5		
<i>Fragaria vesca</i>	28.6	0.1	0.2	0.2	1		
<i>Gnaphalium spp.</i>	28.6	0.1	0.2	0.2	1		
<i>Galium aparine</i>	28.6	0.1	0.1	0.2	0.2		
<i>Gamochaeta ustulata</i>	28.6	0.1	0.1	0.2	0.2		
<i>Horkelia marinensis</i>	28.6	0.1	0.1	0.2	0.2		
<i>Pseudognaphalium canescens ssp. beneolens</i>	28.6	0.1	0.1	0.2	0.2		

Calamagrostis nutkaensis / *Baccharis pilularis* Association
Calamagrostis nutkaensis Herbaceous Alliance

Non-Vascular

Moss

42.9 42.9 0.1 0.2 0.2

***Carex nudata* Herbaceous Alliance**



Common Name: Torrent sedge patches

NVC Alliance Code: N/A.

Statewide Description

Carex nudata is dominant in the herbaceous layer with *Artemisia douglasiana*, *Artemisia ludoviciana*, *Carex praegracilis*, *Carex senta*, *Carex serratodens*, *Cyperus eragrostis*, *Darmera peltata*, *Datisca glomerata*, *Equisetum arvense*, *Equisetum hyemale*, *Mimulus guttatus*, *Paspalum dilatatum*, *Poa pratensis*, and *Stachys stricta*. Emergent riparian trees may be present at low cover, especially *Alnus* spp., *Populus* spp. or *Salix* spp.

The *Carex nudata* Alliance occurs along perennially and seasonally flooded streams in California. Flooding from either winter or spring snowmelt creates regular mechanical impact to boulder and cobble beds creating the characteristic substrate associated with this alliance. Highly scoured reaches of streams flowing through bedrock do not typically harbor the sedge. *Carex senta*, another tufted streambed species, grows in situations similar to *Carex nudata*; it might warrant inclusion in this alliance with further investigation. *Carex nudata* stands are frequently associated with stands of the *Alnus rhombifolia* Alliance and *C. nudata* may occur as an understory beneath open *A. rhombifolia* stands, depending upon flooding frequency and intensity.

Local Vegetation Description

The Torrent sedge patches Alliance forms an intermittent herbaceous layer in the single survey available. The shrub layer is sparse and the tree layer is absent. Dominant herbs include *Carex nudata*, and characteristic herbs include *Cirsium vulgare*, *Equisetum* spp., *Fragaria vesca*, *Galium aparine*, *Helenium puberulum*, *Petasites frigidus*, *Scirpus microcarpus*, *Trifolium subterraneum*, *Urtica dioica*, and *Woodwardia fimbriata*. Commonly associated regenerating or shrubby trees at sparse cover include *Alnus rhombifolia*, *Acer macrophyllum*, and *Sequoia sempervirens*. Commonly associated emergent shrubs at sparse cover include *Cornus sericea*, *Salix lasiolepis*, and *Toxicodendron diversilobum*.

Commonly associated non-vascular plants include Moss.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	NA	no data	no data
Hardwood	0.0	NA	no data	no data
Regenerating or Shrubby Tree	2.4	NA	3.5	2 – 5
Shrub	2.2	NA	1.5	1 – 2
Herb	36.0	NA	0.3	0 – 0.5

Local Membership Rule

Carex nudata dominates with other herbs lower in cover including *Equisetum* spp. along rocky streams and streambanks.

Local Environmental Description

Elevation: 118 m

Aspect: Flat (1)

Slope: 2 degrees

Macro Topography: Bottom (1)

Large Rock: 10.0%

Small Rock: 70.0%

Fines Cover: 12.0%

Litter Cover: 5%

Soil Texture (field assessed): Fine sand (1)

Geology (field or map data): Mixed alluvium (1)

San Mateo County Watersheds: Pescadero Creek (1)

Site Impacts

This alliance has low non-native plant cover (average 1.0%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Cirsium vulgare* and *Trifolium subterraneum*.

Associations in San Mateo County

- *Carex nudata*

Carex nudata Herbaceous Alliance

Classification Comments

None.

References: Evens et al. 2004, Klein et al. 2007, Klein et al. 2015, Potter 2005

Global Rarity Rank: G3

State Rarity Rank: S3

Surveys Used for Description

Total: N=1; San Mateo County (n=1): SMAT0279

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Regenerating or Shrubby Trees	<i>Alnus rhombifolia</i>	100.0	83.3	2.0	2	2	Y	Y		Y
	<i>Acer macrophyllum</i>	100.0	8.3	0.2	0.2	0.2	Y			Y
	<i>Sequoia sempervirens</i>	100.0	8.3	0.2	0.2	0.2	Y			Y
Shrub	<i>Cornus sericea</i>	100.0	45.5	1.0	1	1	Y		Y	Y
	<i>Salix lasiolepis</i>	100.0	45.5	1.0	1	1	Y		Y	Y
	<i>Toxicodendron diversilobum</i>	100.0	9.1	0.2	0.2	0.2	Y			Y
Herb	<i>Carex nudata</i>	100.0	86.2	30.0	30	30	Y	Y		Y
	<i>Equisetum spp.</i>	100.0	8.6	3.0	3	3	Y			Y
	<i>Cirsium vulgare</i>	100.0	0.6	0.2	0.2	0.2	Y			Y
	<i>Fragaria vesca</i>	100.0	0.6	0.2	0.2	0.2	Y			Y
	<i>Galium aparine</i>	100.0	0.6	0.2	0.2	0.2	Y			Y
	<i>Helenium puberulum</i>	100.0	0.6	0.2	0.2	0.2	Y			Y
	<i>Petasites frigidus</i>	100.0	0.6	0.2	0.2	0.2	Y			Y
	<i>Scirpus microcarpus</i>	100.0	0.6	0.2	0.2	0.2	Y			Y
	<i>Trifolium subterraneum</i>	100.0	0.6	0.2	0.2	0.2	Y			Y
	<i>Urtica dioica</i>	100.0	0.6	0.2	0.2	0.2	Y			Y
<i>Woodwardia fimbriata</i>	100.0	0.6	0.2	0.2	0.2	Y			Y	
Non-Vascular	Moss	100.0	100.0	0.2	0.2	0.2	Y	Y		Y

Carex nudata Association

Common Name: Torrent Sedge Patches

Alliance: *Carex nudata* Herbaceous Alliance

Classification Comments

The association circumscription is the same as that of the alliance for the county. See above for detailed description.

References: Evens et al. 2004, Klein et al. 2007, Klein et al. 2015, Potter 2005

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Regenerating or Shrubby Trees	<i>Alnus rhombifolia</i>	100.0	83.3	2.0	2	2		Y		Y
	<i>Sequoia sempervirens</i>	100.0	8.3	0.2	0.2	0.2				Y
	<i>Acer macrophyllum</i>	100.0	8.3	0.2	0.2	0.2				Y
Shrub	<i>Cornus sericea</i>	100.0	45.5	1.0	1	1			Y	Y
	<i>Salix lasiolepis</i>	100.0	45.5	1.0	1	1			Y	Y
	<i>Toxicodendron diversilobum</i>	100.0	9.1	0.2	0.2	0.2				Y
Herb	<i>Carex nudata</i>	100.0	86.2	30.0	30	30		Y		Y
	<i>Equisetum spp.</i>	100.0	8.6	3.0	3	3				Y
	<i>Fragaria vesca</i>	100.0	0.6	0.2	0.2	0.2				Y
	<i>Woodwardia fimbriata</i>	100.0	0.6	0.2	0.2	0.2				Y
	<i>Urtica dioica</i>	100.0	0.6	0.2	0.2	0.2				Y
	<i>Trifolium subterraneum</i>	100.0	0.6	0.2	0.2	0.2				Y
	<i>Scirpus microcarpus</i>	100.0	0.6	0.2	0.2	0.2				Y
	<i>Petasites frigidus</i>	100.0	0.6	0.2	0.2	0.2				Y
	<i>Helenium puberulum</i>	100.0	0.6	0.2	0.2	0.2				Y
	<i>Galium aparine</i>	100.0	0.6	0.2	0.2	0.2				Y
<i>Cirsium vulgare</i>	100.0	0.6	0.2	0.2	0.2				Y	
Non-Vascular										

Moss

100.0 100.0 0.2

0.2

0.2

Y

Y

***Carex obnupta* – *Oenanthe sarmentosa* – *Scirpus microcarpus* Herbaceous Alliance**



Common Name: Slough sedge – water-parsley – small-fruited bulrush marsh

NVC Alliance Code: A4414.

Statewide Description

Carex obnupta, *Juncus lescurii*, *Oenanthe sarmentosa*, *Argentia egedii* (= *Potentilla anserina*) or *Scirpus microcarpus* is dominant or co-dominant in the herbaceous layer with *Agrostis stolonifera*, *Athyrium filix-femina*, *Carex* spp., *Cynosurus echinatus*, *Eleocharis macrostachya*, *Epilobium* spp., *Festuca arundinacea*, *Galium triflorum*, *Geum macrophyllum*, *Glyceria elata*, *Holcus lanatus*, *Hydrocotyle ranunculoides*, *Juncus patens*, *Lemna minuta*, *Luzula comosa*, *Lysichiton americanus*, *Oxypolis occidentalis*, *Rumex conglomeratus*, *Schoenoplectus pungens*, *Scirpus congdonii*, *Sidalcea malviflora*, *Symphyotrichum chilense*, *Typha latifolia* and *Viola macloskeyi*. Emergent trees and shrubs may be present at low cover, including trees: *Alnus rubra*, and shrubs: *Baccharis pilularis*, *Morella californica*, *Rubus* spp., *Salix hookeriana*, and *Salix lasiolepis*.

This alliance includes several previously separate alliances, in which the concept has been broadened based on overlapping environmental and floristic features (NatureServe 2021). Stands in California occur in moist to saturated swales, edges of coastal lagoons, tidally influenced wetlands, and other areas where fresh and brackish

water meet. Plants often form dense, continuous stands that lack or may occur under shrub or forest canopies. Open stands lacking or having only a few emergent shrubs or trees are included in this alliance. Stands with *C. obnupta*, *Oenanthe sarmentosa*, and/or *Scirpus microcarpus* understories are in the *Alnus rubra*, *Morella californica*, *Picea sitchensis*, *Pinus contorta* ssp. *contorta*, and *Salix hookeriana* alliances. Trees and shrubs do not typically colonize the more coastal stands due to the longer inundation period and exposure to strong salt-laden winds. In wet but more sheltered settings, tree development is favored.

At Humboldt Bay National Refuge, stands with *Oenanthe sarmentosa* and *Scirpus microcarpus* occur in semipermanently-flooded freshwater to slightly brackish marshes, and stands may retain standing water through the summer (Pickart 2006). In general, they are seasonally flooded, freshwater to brackish marshes, which are inundated with water for the majority of the year.

Local Vegetation Description

The Slough sedge – water-parsley – small-fruited bulrush marsh Alliance forms an intermittent to continuous herbaceous layer. The shrub layer is open and the tree layer is open. Those herbs often present include *Euthamia occidentalis*, *Oenanthe sarmentosa*, and *Potentilla anserina*, and herbs that are sometimes present include *Achillea millefolium*, *Carex obnupta*, *Cirsium vulgare*, *Epilobium ciliatum*, *Eriophyllum stoechadifolium*, *Fragaria chiloensis*, *Galium aparine*, *Grindelia stricta*, *Holcus lanatus*, *Juncus arcticus*, *Juncus lescurii*, *Juncus* spp., *Lythrum hyssopifolium*, *Marah fabaceus*, *Mimulus guttatus*, *Polygonum* spp., *Pterostegia drymarioides*, *Rumex crispus*, *Rumex occidentalis*, *Rumex salicifolius*, *Scirpus microcarpus*, *Scrophularia californica*, *Solanum douglasii*, *Sonchus asper*, *Symphyotrichum chilense*, and *Urtica dioica*. Commonly associated emergent shrubs include *Rubus ursinus*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.3	0 – 3	12.5	10 – 15
Hardwood	0.3	0 – 3	3.5	2 – 5
Regenerating or Shrubby Tree	0.0	0 – 0	1.5	1 – 2
Shrub	2.9	0 – 16	0.8	0 – 2
Herb	77.8	39 – 97	1.1	0 – 2

Local Membership Rule

Argentina egedii, *Carex obnupta*, *Juncus lescurii*, *Oenanthe sarmentosa*, and/or *Scirpus microcarpus* dominates or co-dominates with other shrubs and herbs including *Baccharis pilularis*, *Calamagrostis nutkaensis*, *Distichlis spicata*, *Holcus lanatus*, *Juncus effusus*, *J. patens*, and *Rubus ursinus* across a variety of freshwater and brackish settings near the coast.

Local Environmental Description

Elevation: Mean 41 m, Range 6 – 183 m

Aspect: Flat (7), SW (1), SE (1)

Slope: Mean 1 degrees, Range 0 – 5 degrees

Carex obnupta – *Oenanthe sarmentosa* – *Scirpus microcarpus* Herbaceous Alliance

Macro Topography: Bottom (6), Lower 1/3 of slope (2), Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 11.7%, Range 0.0 – 87%

Litter Cover: Mean 63.3%, Range 10.0 – 97%

Soil Texture (field assessed): Muck (4), Sand, (class unknown) (3), Medium sand (1), Not recorded (1)

Geology (field or map data): Mixed alluvium (2), Sandstone (2), Alluvium (1), Sandstone and other sedimentary (1), Sand dunes (1), Sedimentary (type unknown) (1), Shale and other sedimentary (1)

San Mateo County Watersheds: Ano Nuevo (4), Pescadero Creek (4), Pacifica (1), San Mateo Bayside (1)

Site Impacts

This alliance has low non-native plant cover (average 8.5%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Cirsium vulgare*, *Holcus lanatus*, *Lythrum hyssopifolium*, *Rumex crispus*, and *Sonchus asper*.

Associations in San Mateo County

- *Argentina egedii* – (*Juncus lescurii*) *Carex obnupta*
- *Juncus lescurii*
- *Scirpus microcarpus* Pacific Coast

Classification Comments

None.

References: Buck-Diaz et al. 2020, Keeler-Wolf et al. 2003a, Klein et al. 2015, Newton 1989, Pickart 200606

Global Rarity Rank: G4

State Rarity Rank: S3

Surveys Used for Description

Total: N=10; San Mateo County (n=10): PGA1041, SMAT0123, SMAT0124, SMAT0138, SMAT0301, SMAT0324, SMAT0661, SMAT0680, SMAT0682, SMATREL0116

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub										

Carex obnupta – *Oenanthe sarmentosa* – *Scirpus microcarpus* Herbaceous Alliance

Herb	<i>Rubus ursinus</i>	60.0	42.5	0.9	0.2	5	Y
	<i>Toxicodendron diversilobum</i>	30.0	9.3	0.3	0.2	3	
	<i>Baccharis pilularis</i>	20.0	7.6	0.3	0.2	3	
	<i>Potentilla anserina</i>	70.0	9.8	7.3	0.2	60	Y
	<i>Euthamia occidentalis</i>	60.0	0.7	0.5	0.2	2	Y
	<i>Oenanthe sarmentosa</i>	50.0	0.6	0.5	0.2	3	Y
	<i>Scirpus microcarpus</i>	40.0	26.1	28.0	50	80	
	<i>Carex obnupta</i>	40.0	21.7	18.7	2	90	
	<i>Rumex crispus</i>	40.0	0.9	0.7	0.2	6	
	<i>Galium aparine</i>	40.0	0.3	0.2	0.2	1	
	<i>Achillea millefolium</i>	40.0	0.1	0.1	0.2	0.2	
	<i>Juncus spp.</i>	30.0	8.6	4.1	0.2	40	
	<i>Urtica dioica</i>	30.0	2.9	2.9	3	20	
	<i>Juncus lescurii</i>	30.0	2.8	1.6	2	9	
	<i>Symphyotrichum chilense</i>	30.0	0.3	0.1	0.2	1	
	<i>Marah fabaceus</i>	30.0	0.2	0.1	0.2	1	
	<i>Epilobium ciliatum</i>	30.0	0.1	0.1	0.2	0.2	
	<i>Juncus arcticus</i>	20.0	9.0	7.6	0.2	76	
	<i>Holcus lanatus</i>	20.0	4.1	3.5	0.2	35	
	<i>Polygonum spp.</i>	20.0	0.5	0.4	1	3	
	<i>Eriophyllum stoechadifolium</i>	20.0	0.7	0.3	0.2	3	
	<i>Scrophularia californica</i>	20.0	0.1	0.2	0.2	2	
	<i>Rumex occidentalis</i>	20.0	0.2	0.1	0.2	1	
	<i>Mimulus guttatus</i>	20.0	0.3	0.1	0.2	1	
	<i>Lythrum hyssopifolium</i>	20.0	0.1	0.1	0.2	1	
	<i>Solanum douglasii</i>	20.0	0.1	0.0	0.2	0.2	
	<i>Sonchus asper</i>	20.0	0.1	0.0	0.2	0.2	
	<i>Cirsium vulgare</i>	20.0	0.0	0.0	0.2	0.2	
	<i>Fragaria chiloensis</i>	20.0	0.1	0.0	0.2	0.2	
	<i>Pterostegia drymarioides</i>	20.0	0.1	0.0	0.2	0.2	
	<i>Grindelia stricta</i>	20.0	0.0	0.0	0.2	0.2	
<i>Rumex salicifolius</i>	20.0	0.1	0.0	0.2	0.2		

***Argentina egedii* – (*Juncus lescurii*) Association**

Common Name: Silverweed – (San Francisco Rush) Patches

Alliance: *Carex obnupta* – *Oenanthe sarmentosa* – *Scirpus microcarpus* Herbaceous Alliance

Local Vegetation Description

The Silverweed – (San Francisco Rush) Association forms a continuous herbaceous layer in the single survey available. The shrub layer is sparse and the tree layer is absent. Dominant herbs include *Argentina egedii* (= *Potentilla anserina*). Those herbs often present include *Holcus lanatus*, and herbs that are sometimes present include *Achillea millefolium*, *Briza minor*, *Carex obnupta*, *Cirsium vulgare*, *Eryngium armatum*, *Festuca arundinacea*, *Juncus* spp., *Juncus bufonius*, *Juncus effusus*, *Juncus patens*, *Juncus phaeocephalus*, *Lotus corniculatus*, *Plantago lanceolata*, *Rumex acetosella*, *Rumex crispus*, *Sisyrinchium bellum*, *Taraxacum officinale*, and *Trifolium wormskioldii*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	NA	no data	no data
Hardwood	0.0	NA	no data	no data
Regenerating or Shrubby Tree	0.0	NA	no data	no data
Shrub	1.0	NA	0.3	0 – 0.5
Herb	74.0	NA	0.3	0 – 0.5

Local Environmental Description

Elevation: 10 m

Aspect: Flat (1)

Slope: 0 degrees

Macro Topography: Bottom (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: 5.0%

Litter Cover: 60%

Soil Texture (field assessed): Muck (1)

Geology (field or map data):

San Mateo County Watersheds: Pescadero Creek (1)

Site Impacts

This association has low non-native plant cover (average 7.9%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Briza minor*, *Cirsium vulgare*, *Festuca arundinacea*, *Holcus lanatus*, *Lotus corniculatus*, *Plantago lanceolata*, *Rumex acetosella*, *Rumex crispus*, and *Taraxacum officinale*.

Classification Comments

The name of the vegetation type has been updated from the *Argentina egedii* Association. The scientific name within the alliance and association is based on the USDA/NRCS PLANTS database name for the taxon, whereas the California flora accepts the name *Potentilla anserina* for this species.

References: Klein et al. 2015, Pickart 2006

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=1; San Mateo County (n=1): SMAT0123

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Rubus ursinus</i>	100.0	83.3	1.0	1	1		Y		Y
	<i>Toxicodendron diversilobum</i>	100.0	16.7	0.2	0.2	0.2				Y
Herb	<i>Potentilla anserina</i>	100.0	80.4	60.0	60	60		Y		Y
	<i>Rumex crispus</i>	100.0	8.0	6.0	6	6				Y
	<i>Juncus lescurii</i>	100.0	6.7	5.0	5	5				Y
	<i>Polygonum spp.</i>	100.0	4.0	3.0	3	3				Y
	<i>Achillea millefolium</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Euthamia occidentalis</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Plagiobothrys chorisianus</i>	100.0	0.3	0.2	0.2	0.2				Y

Carex obnupta Association

Common Name: Slough sedge Patches

Alliance: *Carex obnupta* – *Oenanthe sarmentosa* – *Scirpus microcarpus* Herbaceous Alliance

Local Vegetation Description

The Slough sedge Association forms a continuous herbaceous layer. The shrub layer is sparse and the tree layer is absent. Those herbs often present include *Juncus effusus* and *Oenanthe sarmentosa*, and herbs that are sometimes present include *Athyrium filix-femina*, *Cirsium vulgare*, *Galium aparine*, *Holcus lanatus*, and *Potentilla anserina*. Commonly associated emergent shrubs at sparse cover include *Rubus ursinus*

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	1.1	0.2 – 2.0	1.1	0.5 – 2
Herb	91.5	88 – 95	1.5	1 – 2

Local Environmental Description

Elevation: Mean 8 m, Range 6 – 9 m

Aspect: Flat (2)

Slope: Mean 1 degrees, Range 0 – 1 degrees

Macro Topography: Bottom (1), Lower 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 0.6%, Range 0.2 – 1.0%

Litter Cover: Mean 96.5%, Range 96.0 – 97%

Soil Texture (field assessed): Medium sand (1), Muck (1)

Geology (field or map data): Mixed alluvium (1), Sand dunes (1)

San Mateo County Watersheds: Ano Nuevo (1), Pescadero Creek (1)

Site Impacts

This association has very low non-native plant cover (average 0.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Cirsium vulgare* and *Holcus lanatus*.

Classification Comments

None.

References: Buck-Diaz et al. 2020, Klein et al. 2015, Newton 1989, Pickart 2006

Carex obnupta Association
Carex obnupta – *Oenanthe sarmentosa* – *Scirpus microcarpus* Herbaceous Alliance

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=2; San Mateo County (n=2): SMAT0138, SMAT0324

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Rubus ursinus</i>	50.0	50.0	1.0	2	2				Y
Herb	<i>Carex obnupta</i>	100.0	91.8	85.0	80	90		Y		Y
	<i>Euthamia occidentalis</i>	100.0	1.1	1.1	0.2	2				Y
	<i>Potentilla anserina</i>	100.0	0.7	0.6	0.2	1				Y
	<i>Oenanthe sarmentosa</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Schoenoplectus californicus</i>	50.0	1.7	1.5	3	3				Y
	<i>Urtica dioica</i>	50.0	1.5	1.5	3	3				Y
	<i>Juncus lescurii</i>	50.0	1.0	1.0	2	2				Y
	<i>Juncus spp.</i>	50.0	0.6	0.5	1	1				Y
	<i>Typha angustifolia</i>	50.0	0.6	0.5	1	1				Y
	<i>Galium aparine</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Grindelia stricta</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Juncus arcticus</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Rumex crispus</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Eriophyllum stoechadifolium</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Symphotrichum chilense</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Marah fabaceus</i>	50.0	0.1	0.1	0.2	0.2				Y

***Juncus lescurii* Association**

Common Name: Salt Rush Patches

Alliance: *Carex obnupta* – *Oenanthe sarmentosa* – *Scirpus microcarpus* Herbaceous Alliance

Local Vegetation Description

The Salt Rush Association forms an intermittent herbaceous layer. The shrub layer is open and the tree layer is absent. Dominant herbs include *Juncus lescurii*. Those herbs that are sometimes present include *Achillea millefolium*, *Amsinckia* spp., *Carex obnupta*, *Distichlis spicata*, *Epilobium ciliatum*, *Eriophyllum stoechadifolium*, *Euthamia occidentalis*, *Mimulus guttatus*, *Potentilla anserina*, *Pterostegia drymarioides*, *Rumex salicifolius*, *Sonchus asper*, and *Symphyotrichum chilense*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	4.5	4.0 – 5.0	0.5	0 – 1
Herb	39.5	39 – 40	0.8	0.5 – 1

Local Environmental Description

Elevation: Mean 11 m, Range 11 – 11 m

Aspect: Flat (1), SW (1)

Slope: Mean 3 degrees, Range 0 – 5 degrees

Macro Topography: Bottom (1), Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 3.5%, Range 0.0 – 7.0%

Litter Cover: Mean 52.5%, Range 10.0 – 95%

Soil Texture (field assessed): Sand, (class unknown) (2)

Geology (field or map data): Sandstone (2)

San Mateo County Watersheds: Ano Nuevo (2)

Site Impacts

This association has low non-native plant cover (average 1.3%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Sonchus asper*.

Classification Comments

Juncus lescurii Association
Carex obnupta – *Oenanthe sarmentosa* – *Scirpus microcarpus* Herbaceous Alliance

While sometimes the dominant *Juncus* was not identified at the species level, with further review of the data, the stands surveyed appear to be *Juncus lescurii*.

References: Klein et al. 2015, Pickart 2006

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=2; San Mateo County (n=2): SMAT0661, SMAT0680

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	100.0	38.1	1.6	0.2	3			Y	Y
	<i>Toxicodendron diversilobum</i>	100.0	38.1	1.6	0.2	3			Y	Y
	<i>Lupinus arboreus</i>	50.0	16.7	0.1	0.2	0.2				Y
	<i>Rubus ursinus</i>	50.0	7.1	0.5	1	1				Y
Herb	<i>Euthamia occidentalis</i>	100.0	2.1	1.0	1	1				Y
	<i>Mimulus guttatus</i>	100.0	1.3	0.6	0.2	1				Y
	<i>Symphotrichum chilense</i>	100.0	1.3	0.6	0.2	1				Y
	<i>Sonchus asper</i>	100.0	0.4	0.2	0.2	0.2				Y
	<i>Achillea millefolium</i>	100.0	0.4	0.2	0.2	0.2				Y
	<i>Pterostegia drymarioides</i>	100.0	0.4	0.2	0.2	0.2				Y
	<i>Epilobium ciliatum</i>	100.0	0.4	0.2	0.2	0.2				Y
	<i>Rumex salicifolius</i>	100.0	0.4	0.2	0.2	0.2				Y
	<i>Juncus spp.</i>	50.0	42.4	20.0	40	40				Y
	<i>Carex obnupta</i>	50.0	16.0	7.5	15	15				Y
	<i>Juncus lescurii</i>	50.0	9.6	4.5	9	9				Y
	<i>Urtica dioica</i>	50.0	6.4	3.0	6	6				Y
	<i>Potentilla anserina</i>	50.0	3.2	1.5	3	3				Y
	<i>Eriophyllum stoechadifolium</i>	50.0	3.2	1.5	3	3				Y
	<i>Chenopodium californicum</i>	50.0	2.1	1.0	2	2				Y
	<i>Oenanche sarmentosa</i>	50.0	1.1	0.5	1	1				Y
	<i>Marah fabaceus</i>	50.0	1.1	0.5	1	1				Y
<i>Galium aparine</i>	50.0	1.1	0.5	1	1				Y	
<i>Rumex occidentalis</i>	50.0	1.1	0.5	1	1				Y	

Juncus lescurii Association

Carex obnupta – *Oenanche sarmentosa* – *Scirpus microcarpus* Herbaceous Alliance

<i>Juncus phaeocephalus</i>	50.0	1.1	0.5	1	1	Y
<i>Rumex acetosella</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Phacelia distans</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Conyza canadensis</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Ambrosia chamissonis</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Amsinckia spp.</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Solanum douglasii</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Stachys ajugoides</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Eschscholzia californica</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Dudleya caespitosa</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Daucus pusillus</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Pseudognaphalium stramineum</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Artemisia pycnocephala</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Lythrum hyssopifolium</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Trifolium wormskioldii</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Claytonia perfoliata</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Fragaria chiloensis</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Mentha arvensis</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Geranium dissectum</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Carex harfordii</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Pseudognaphalium luteoalbum</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Artemisia douglasiana</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Festuca spp.</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Cardamine oligosperma</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Euthamia occidentalis</i>	100.0	2.1	1.0	1	1	Y
Non-Vascular						
Moss	50.0	50.0	35.0	70	70	Y

***Scirpus microcarpus* Pacific Coast Association**

Common Name: Small-fruited Bulrush Pacific Coast Marsh Patches

Alliance: *Carex obnupta* – *Oenanthe sarmentosa* – *Scirpus microcarpus* Herbaceous Alliance

Local Vegetation Description

The Small-fruited Bulrush Pacific Coast Marsh Association forms a continuous herbaceous layer. The shrub layer is absent or open and the tree layer is sparse or absent. Dominant herbs include *Scirpus microcarpus*. Those herbs that are sometimes present include *Athyrium filix-femina*, *Calamagrostis nutkaensis*, *Carex obnupta*, *Cirsium vulgare*, *Equisetum arvense*, *Oenanthe sarmentosa*, *Potentilla anserina*, *Stachys ajugoides*, and *Urtica dioica*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.8	0 – 3	12.5	10 – 15
Hardwood	0.8	0 – 3	3.5	2 – 5
Regenerating or Shrubby Tree	0.0	0 – 0.2	1.5	1 – 2
Shrub	4.1	0.0 – 16.0	0.9	0 – 2
Herb	90.5	85 – 97	1.3	0.5 – 2

Local Environmental Description

Elevation: Mean 89 m, Range 9 – 183 m

Aspect: Flat (2), SE (1)

Slope: Mean 1 degrees, Range 0 – 3 degrees

Macro Topography: Bottom (2), Lower 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 29.0%, Range 0.0 – 87.0%

Litter Cover: Mean 40.0%, Range 10.0 – 95%

Soil Texture (field assessed): Sand, (class unknown) (1), Muck (1), Not recorded (1)

Geology (field or map data): Shale and other sedimentary (1), Mixed alluvium (1), Sandstone and other sedimentary (1), Sedimentary (type unknown) (1)

San Mateo County Watersheds: Ano Nuevo (1), Pacifica (1), Pescadero Creek (1), San Mateo Bayside (1)

Site Impacts

This association has low non-native plant cover (average 18.4%) relative to native cover.

Classification Comments

Scirpus microcarpus Pacific Coast Association
Carex obnupta – *Oenanthe sarmentosa* – *Scirpus microcarpus* Herbaceous Alliance

This association is newly distinguished from *Scirpus microcarpus* dominated stands in montane settings, which were all formerly included in their own alliance. Now the coastal association is placed here with related associations.

References: Keeler-Wolf et al. 2003a, Klein et al. 2015, Pickart 2006

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=4; San Mateo County (n=4): PGA1041, SMAT0301, SMAT0682, SMATREL0116

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Quercus parvula</i> var. <i>shrevei</i>	25.0	12.1	0.8	3	3				
	<i>Pseudotsuga menziesii</i>	25.0	12.1	0.8	3	3				
	<i>Notholithocarpus densiflorus</i>	25.0	0.8	0.1	0.2	0.2				
Shrub	<i>Rubus ursinus</i>	50.0	31.8	1.3	0.2	5				Y
	<i>Sambucus racemosa</i>	25.0	13.6	2.5	10	10				
	<i>Frangula californica</i>	25.0	4.1	0.8	3	3				
	<i>Salix lasiolepis</i>	25.0	0.3	0.1	0.2	0.2				
	<i>Diplacus aurantiacus</i>	25.0	0.3	0.1	0.2	0.2				
Herb	<i>Scirpus microcarpus</i>	100.0	65.3	70.0	50	80		Y		Y
	<i>Holcus lanatus</i>	50.0	10.3	8.8	0.2	35				Y
	<i>Potentilla anserina</i>	50.0	1.5	1.5	2	4				Y
	<i>Oenanthe sarmentosa</i>	50.0	0.8	0.8	0.2	3				Y
	<i>Scrophularia californica</i>	50.0	0.4	0.6	0.2	2				Y
	<i>Rumex crispus</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Cirsium vulgare</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Delairea odorata</i>	25.0	3.8	3.8	15	15				
	<i>Urtica dioica</i>	25.0	3.2	5.0	20	20				
	<i>Calamagrostis nutkaensis</i>	25.0	3.2	5.0	20	20				
	<i>Vinca major</i>	25.0	2.9	4.5	18	18				
	<i>Sparganium eurycarpum</i>	25.0	1.5	1.5	6	6				
<i>Tropaeolum majus</i>	25.0	1.3	1.3	5	5					

Scirpus microcarpus Pacific Coast Association
Carex obnupta – *Oenanthe sarmentosa* – *Scirpus microcarpus* Herbaceous Alliance

<i>Elymus californicus</i>	25.0	1.1	1.8	7	7
<i>Equisetum arvense</i>	25.0	1.0	1.0	4	4
<i>Cyperus eragrostis</i>	25.0	0.5	0.5	2	2
<i>Polygonum punctatum</i>	25.0	0.5	0.5	2	2
<i>Stachys bullata</i>	25.0	0.5	0.8	3	3
<i>Vicia gigantea</i>	25.0	0.3	0.5	2	2
<i>Carex obnupta</i>	25.0	0.3	0.5	2	2
<i>Lythrum hyssopifolium</i>	25.0	0.3	0.3	1	1
<i>Heracleum maximum</i>	25.0	0.2	0.3	1	1
<i>Juncus spp.</i>	25.0	0.1	0.1	0.2	0.2
<i>Polypogon monspeliensis</i>	25.0	0.1	0.1	0.2	0.2
<i>Erigeron glaucus</i>	25.0	0.1	0.1	0.2	0.2
<i>Oenothera elata</i>	25.0	0.1	0.1	0.2	0.2
<i>Nasturtium officinale</i>	25.0	0.1	0.1	0.2	0.2
<i>Rumex occidentalis</i>	25.0	0.1	0.1	0.2	0.2
<i>Plantago subnuda</i>	25.0	0.1	0.1	0.2	0.2
<i>Raphanus sativus</i>	25.0	0.1	0.1	0.2	0.2
<i>Fragaria chiloensis</i>	25.0	0.1	0.1	0.2	0.2
<i>Achillea millefolium</i>	25.0	0.1	0.1	0.2	0.2
<i>Epilobium ciliatum</i>	25.0	0.1	0.1	0.2	0.2
<i>Equisetum telmateia</i>	25.0	0.1	0.1	0.2	0.2
<i>Athyrium filix-femina</i>	25.0	0.1	0.1	0.2	0.2
<i>Grindelia stricta</i>	25.0	0.1	0.1	0.2	0.2
<i>Eriophyllum spp.</i>	25.0	0.0	0.1	0.2	0.2
<i>Polystichum munitum</i>	25.0	0.0	0.1	0.2	0.2
<i>Erechtites minimus</i>	25.0	0.0	0.1	0.2	0.2
<i>Pteridium aquilinum</i>	25.0	0.0	0.1	0.2	0.2
<i>Phacelia malvifolia</i>	25.0	0.0	0.1	0.2	0.2
<i>Myosotis latifolia</i>	25.0	0.0	0.1	0.2	0.2
<i>Solanum douglasii</i>	25.0	0.0	0.1	0.2	0.2
<i>Galium aparine</i>	25.0	0.0	0.1	0.2	0.2
<i>Calystegia purpurata</i>	25.0	0.0	0.1	0.2	0.2
<i>Cirsium brevistylum</i>	25.0	0.0	0.1	0.2	0.2
<i>Marah fabaceus</i>	25.0	0.0	0.1	0.2	0.2
<i>Helenium puberulum</i>	25.0	0.0	0.0	0.11	0.11
<i>Lotus corniculatus</i>	25.0	0.0	0.0	0.11	0.11
<i>Mentha pulegium</i>	25.0	0.0	0.0	0.11	0.11

***Cortaderia (jubata, selloana)* Herbaceous Semi-Natural Alliance**



Common Name: Pampas grass patches

NVC Alliance Code: A1203. *Cortaderia jubata* - *Cortaderia selloana* Ruderal Grassland Alliance

Statewide Description

Cortaderia jubata or *Cortaderia selloana* is dominant in the herbaceous and shrub canopies. Emergent trees and shrubs may be present at low cover. Stands of *Cortaderia* invade coastal bluff and coastal scrub stands of *Artemisia californica*, *Baccharis pilularis*, and *Eriogonum fasciculatum* alliances. They grow in moist, open forest stands and infest inland riparian stands in the Great Valley.

Local Vegetation Description

The Pampas grass patches Alliance forms an open to intermittent herbaceous layer. The shrub layer is open and the tree layer is absent. Dominant herbs include *Cortaderia jubata*. Those herbs often present include *Achillea millefolium*, *Anagallis arvensis*, *Avena* spp., *Camissonia ovata*, *Cardamine oligosperma*, *Clinopodium douglasii*, *Daucus carota*, *Dudleya farinosa*, *Eriogonum* spp., *Gamochaeta ustulata*, *Geranium dissectum*, *Hypochaeris radicata*, *Pseudognaphalium ramosissimum*, *Sedum spathulifolium*, and *Symphotrichum chilense*. Commonly associated emergent shrubs include *Artemisia californica*, *Genista monspessulana*, *Toxicodendron diversilobum*, *Baccharis pilularis*, *Diplacus aurantiacus*, and *Echium candicans*. Commonly associated non-vascular plants include Lichen and Moss.

Cortaderia (jubata, selloana) Herbaceous Semi-Natural Alliance

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	5.0	2 – 8	0.5	0 – 1
Herb	50.5	18 – 83	1.1	0.5 – 2

Local Membership Rule

Cortaderia jubata or *Cortaderia selloana* dominates in naturalized stands, sometimes in dense clumps, or with other non-native plants such as *Echium candicans* dominant or co-dominant with *Cortaderia jubata*.

Local Environmental Description

Elevation: Mean 100 m, Range 96 – 104 m

Aspect: SE (1), SW (1)

Slope: Mean 30 degrees, Range 21 – 38 degrees

Macro Topography: Middle 1/3 of slope (1), Upper 1/3 of slope (1)

Large Rock: Mean 46.6%, Range 0.0 – 93%

Small Rock: Mean 2.7%, Range 0.4 – 5.0%

Fines Cover: Mean 3.5%, Range 2.0 – 5.0%

Litter Cover: Mean 37.0%, Range 4.0 – 70%

Soil Texture (field assessed): Medium to very fine, loamy sand (1), Not recorded (1)

Geology (field or map data): Franciscan melange (1), Granitic (generic) (1)

San Mateo County Watersheds: Pacifica (1)

Other Watersheds, Marin Co.: Bolinas (1)

Site Impacts

This alliance has greater cover of exotics than natives, non-native plant cover (average 84.0%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Cortaderia jubata*, *Daucus carota*, *Echium candicans*, *Genista monspessulana*, *Geranium dissectum*, and *Hypochaeris radicata*.

Associations in San Mateo County

- *Cortaderia (jubata, selloana)*

Classification Comments

Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: Buck-Diaz et al. 2012

Global Rarity Rank: GNA

State Rarity Rank: SNA

Surveys Used for Description

Cortaderia (jubata, selloana) Herbaceous Semi-Natural Alliance

Total: N=2; San Mateo County (n=1): SMAT0012

Marin County (n=1): MARIN318

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft	
Shrub	<i>Artemisia californica</i>	100.0	42.0	3.1	0.2	6	Y		Y	Y	
	<i>Genista monspessulana</i>	100.0	12.2	0.6	0.2	1	Y			Y	
	<i>Toxicodendron diversilobum</i>	100.0	7.4	0.2	0.2	0.2	Y			Y	
	<i>Baccharis pilularis</i>	50.0	31.2	0.5	1	1				Y	
	<i>Diplacus aurantiacus</i>	50.0	6.0	0.5	1	1				Y	
	<i>Echium candicans</i>	50.0	1.2	0.1	0.2	0.2				Y	
	Herb	<i>Cortaderia jubata</i>	100.0	96.5	51.0	18	84	Y	Y		Y
<i>Achillea millefolium</i>		50.0	0.1	0.1	0.2	0.2				Y	
<i>Symphotrichum chilense</i>		50.0	0.1	0.1	0.2	0.2				Y	
<i>Sedum spathulifolium</i>		50.0	0.5	0.1	0.2	0.2				Y	
<i>Pseudognaphalium ramosissimum</i>		50.0	0.1	0.1	0.2	0.2				Y	
<i>unknown Poaceae</i>		50.0	0.1	0.1	0.2	0.2				Y	
<i>Hypochaeris radicata</i>		50.0	0.1	0.1	0.2	0.2				Y	
<i>Geranium dissectum</i>		50.0	0.1	0.1	0.2	0.2				Y	
<i>Gamochaeta ustulata</i>		50.0	0.1	0.1	0.2	0.2				Y	
<i>Dudleya farinosa</i>		50.0	0.5	0.1	0.2	0.2				Y	
<i>Daucus carota</i>		50.0	0.1	0.1	0.2	0.2				Y	
<i>Clinopodium douglasii</i>		50.0	0.1	0.1	0.2	0.2				Y	
<i>Camissonia ovata</i>		50.0	0.1	0.1	0.2	0.2				Y	
<i>Cardamine oligosperma</i>		50.0	0.1	0.1	0.2	0.2				Y	
<i>Eriogonum spp.</i>		50.0	0.5	0.1	0.2	0.2				Y	
<i>Anagallis arvensis</i>		50.0	0.1	0.1	0.2	0.2				Y	
<i>Avena spp.</i>		50.0	0.5	0.1	0.2	0.2				Y	
Non-Vascular		Lichen	50.0	25.0	0.1	0.2	0.2				Y
		Moss	50.0	25.0	0.1	0.2	0.2				Y

***Cortaderia (jubata, selloana)* Provisional Association**

Common Name: Pampasgrass and Jubatagrass Patches

Alliance: *Cortaderia (jubata, selloana)* Herbaceous Semi-Natural Alliance

Classification Comments

The association circumscription is the same as that of the alliance. See above for detailed description.

References: Buck-Diaz et al. 2012

Global Rarity Rank: GNA

State Rarity Rank: SNA

State Rare: N

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Artemisia californica</i>	100.0	42.0	3.1	0.2	6			Y	Y
	<i>Genista monspessulana</i>	100.0	12.2	0.6	0.2	1				Y
	<i>Toxicodendron diversilobum</i>	100.0	7.4	0.2	0.2	0.2				Y
	<i>Baccharis pilularis</i>	50.0	31.2	0.5	1	1				Y
	<i>Diplacus aurantiacus</i>	50.0	6.0	0.5	1	1				Y
	<i>Echium candicans</i>	50.0	1.2	0.1	0.2	0.2				Y
	Herb	<i>Cortaderia jubata</i>	100.0	96.5	51.0	18	84		Y	
<i>Avena spp.</i>		50.0	0.5	0.1	0.2	0.2				Y
<i>Sedum spathulifolium</i>		50.0	0.5	0.1	0.2	0.2				Y
<i>Dudleya farinosa</i>		50.0	0.5	0.1	0.2	0.2				Y
<i>Eriogonum spp.</i>		50.0	0.5	0.1	0.2	0.2				Y
<i>Achillea millefolium</i>		50.0	0.1	0.1	0.2	0.2				Y
<i>Gamochaeta ustulata</i>		50.0	0.1	0.1	0.2	0.2				Y
<i>Geranium dissectum</i>		50.0	0.1	0.1	0.2	0.2				Y
<i>Clinopodium douglasii</i>		50.0	0.1	0.1	0.2	0.2				Y
<i>Camissonia ovata</i>		50.0	0.1	0.1	0.2	0.2				Y
<i>Cardamine oligosperma</i>		50.0	0.1	0.1	0.2	0.2				Y
<i>Anagallis arvensis</i>		50.0	0.1	0.1	0.2	0.2				Y
<i>Hypochaeris radicata</i>		50.0	0.1	0.1	0.2	0.2				Y
<i>Daucus carota</i>		50.0	0.1	0.1	0.2	0.2				Y
<i>Pseudognaphalium ramosissimum</i>		50.0	0.1	0.1	0.2	0.2				Y
<i>unknown Poaceae</i>		50.0	0.1	0.1	0.2	0.2				Y

Non-Vascular	<i>Symphyotrichum chilense</i>	50.0	0.1	0.1	0.2	0.2	Y
	Moss	50.0	25.0	0.1	0.2	0.2	Y
	Lichen	50.0	25.0	0.1	0.2	0.2	Y

***Deschampsia cespitosa* – *Hordeum brachyantherum* – *Danthonia californica* Herbaceous Alliance**



Common Name: Coastal tufted hair grass – Meadow barley – California oatgrass meadows

NVC Alliance Code: A3820. *Danthonia californica* - *Carex lenticularis* - *Deschampsia cespitosa* Coastal & Lowland Marsh Alliance

Statewide Description

Deschampsia cespitosa, *Hordeum brachyantherum* or *Iris douglasiana* is dominant or co-dominant in the herbaceous layer with *Achillea millefolium*, *Agrostis stolonifera*, *Aira caryophylla*, *Anthoxanthum odoratum*, *Argentina egedii*, *Carex* spp., *Cirsium vulgare*, *Danthonia californica*, *Deschampsia danthonioides*, *Distichlis spicata*, *Eleocharis acicularis*, *Eleocharis macrostachya*, *Epilobium ciliatum*, *Eryngium armatum*, *Holcus lanatus*, *Horkelia marinensis*, *Hypochaeris radicata*, *Juncus arcticus*, *Juncus phaeocephalus*, *Lilaeopsis masonii*, *Lolium perenne*, *Lotus* spp., *Lupinus versicolor*, *Medicago polymorpha*, *Plantago lanceolata*, *Potentilla gracilis*, *Ranunculus californicus*, *Ranunculus flammula*, *Rumex acetosella*, *Senecio hydrophiloides*, *Sisyrinchium bellum*, *Trifolium* spp. and *Triglochin striata*.

Emergent shrubs may be present at low cover, including *Baccharis pilularis*, *Rosa nutkana*, *Rubus* spp. and *Rubus ursinus*.

We now accept the treatment of two alliances for *Deschampsia cespitosa*, separating the coastal and lowland stands from those in higher-elevation mountain meadows. Stands

Deschampsia cespitosa – *Hordeum brachyantherum* – *Danthonia californica* Herbaceous Alliance

along the coast and at lower elevations occur in moist, maritime climates on soils with high moisture-holding capacity or on perched water tables, whereby the associations included in this alliance have a lush growth of *D. cespitosa*, *Danthonia californica*, *Hordeum brachyantherum*, and other perennial herbs (NatureServe 2020).

Similar to *D. cespitosa*, *H. brachyantherum* has a broad temperature tolerance, enabling stands to exist adjacent to a divergent array of wetland alliances. Directly along the coast, associations of this alliance interdigitate on a fine scale with herbaceous stands of the *Calamagrostis nutkaensis*, *Festuca idahoensis* - *Danthonia californica*, *Carex obnupta*, and *Juncus* spp. alliances; and woody stands of *Baccharis pilularis*, *Pinus muricata* and *Pseudotsuga menziesii* alliances; and non-native types. Typical associated herbs include *Eleocharis macrostachya*, *Juncus balticus*, and *J. nevadensis*.

Stands of *Deschampsia cespitosa*, *Danthonia californica*, *Hordeum brachyantherum*, in montane meadows fall under the *Danthonia californica* - *Deschampsia cespitosa* - *Camassia quamash* Alliance.

Local Vegetation Description

The Coastal tufted hair grass – Meadow barley – California oatgrass meadows Alliance forms an intermittent to continuous herbaceous layer. The shrub layer is open and the tree layer is open. Those herbs often present include *Achillea millefolium*, *Danthonia californica*, *Fragaria chiloensis*, *Gamochaeta ustulata*, *Hypochaeris radicata*, *Juncus bufonius*, and *Lotus corniculatus*, and herbs that are sometimes present include *Anagallis arvensis*, *Armeria maritima*, *Bromus carinatus*, *Bromus hordeaceus*, *Camissonia ovata*, *Carex brevicaulis*, *Carex subbracteata*, *Centaurium muehlenbergii*, *Deschampsia cespitosa*, *Dudleya caespitosa*, *Eriogonum latifolium*, *Eryngium armatum*, *Geranium dissectum*, *Grindelia stricta*, *Holcus lanatus*, *Hordeum brachyantherum*, *Juncus occidentalis*, *Juncus patens*, *Juncus phaeocephalus*, *Lolium perenne*, *Lotus formosissimus*, *Lythrum hyssopifolium*, *Picris echioides*, *Plantago lanceolata*, *Plantago maritima*, *Prunella vulgaris*, *Ranunculus californicus*, *Rumex acetosella*, *Rumex crispus*, *Sidalcea malviflora*, *Sisyrinchium bellum*, *Sonchus asper*, *Vulpia bromoides*, and *Vulpia myuros*. Commonly associated emergent shrubs include *Baccharis pilularis*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.4	0 – 3	7.5	5 – 10
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0.0 – 0.0	no data	no data
Shrub	4.8	0.2 – 15.0	0.4	0 – 2
Herb	63.9	39 – 82	0.3	0 – 0.5

Local Membership Rule

Deschampsia cespitosa, *Danthonia californica*, *Iris douglasiana*, and/or *Eryngium armatum* dominate or co-dominate individually or in combination (if *Holcus lanatus* has the highest cover, but these three species have at least 10% combined cover, key to *Deschampsia*). Settings range from coastal dunes and bluffs to inland plains (e.g., Santa Rosa Plain) to montane meadows.

Local Environmental Description

Elevation: Mean 15 m, Range 9 – 25 m

Aspect: Flat (4), NE (2), NW (1), Variable (1)

Slope: Mean 2 degrees, Range 0 – 6 degrees

Macro Topography: Lower 1/3 of slope (2), Ridge top (2), Bottom to Lower 1/3 of slope (1), Middle 1/3 of slope (1), Upper 1/3 of slope (1), Bottom (1)

Large Rock: Mean 0.0%, Range 0.0 – 0.0%

Small Rock: Mean 0.2%, Range 0.0 – 0.2%

Fines Cover: Mean 39.0%, Range 5.0 – 97.0%

Litter Cover: Mean 53.1%, Range 0.0 – 92%

Soil Texture (field assessed): Moderately fine clay loam (3), Sand, (class unknown) (2), Moderately fine sandy clay loam (1), Coarse, loamy sand (1), Fine sandy clay (1)

Geology (field or map data): Sedimentary (type unknown) (3), Granitic (generic) (1), Sand dunes (1), Sandstone (1), Sandstone and other sedimentary (1), Clayey alluvium (1)

San Mateo County Watersheds: Ano Nuevo (4), Pacifica (3), Tunitas Creek (1)

Site Impacts

This alliance has moderate non-native plant cover (average 24.6%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Bromus hordeaceus*, *Geranium dissectum*, *Holcus lanatus*, *Hypochaeris radicata*, *Lotus corniculatus*, *Lythrum hyssopifolium*, *Picris echioides*, *Plantago lanceolata*, *Rumex acetosella*, *Rumex crispus*, *Sonchus asper*, *Vulpia bromoides*, and *Vulpia myuros*.

Associations in San Mateo County

- *Deschampsia (cespitosa, holciformis)*
- *Deschampsia cespitosa – Danthonia californica*
- *Deschampsia cespitosa – Eryngium armatum*
- *Hordeum brachyantherum* Lowland

Classification Comments

None.

References: Buck-Diaz et al. 2020, Keeler-Wolf et al. 2003a, Klein et al. 2015, Pickart 2006

Global Rarity Rank: GNR

State Rarity Rank: S3

Surveys Used for Description

Total: N=8; San Mateo County (n=8): SMAT0121, SMAT0122, SMAT0272, SMAT0332, SMAT0644, SMAT0648, SMAT0681, SMATREL0169

Alliance Stand Table

Deschampsia cespitosa – Hordeum brachyantherum – Danthonia californica Herbaceous Alliance
675

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft	
Shrub	<i>Baccharis pilularis</i>	100.0	86.2	4.6	0.2	15	Y	Y		Y	
	<i>Lupinus versicolor</i>	25.0	12.5	0.2	0.2	1					
Herb	<i>Lotus corniculatus</i>	62.5	7.4	4.4	0.2	25				Y	
	<i>Danthonia californica</i>	62.5	6.3	3.8	0.2	15				Y	
	<i>Hypochaeris radicata</i>	62.5	0.5	0.2	0.2	1				Y	
	<i>Juncus bufonius</i>	50.0	1.7	0.7	0.2	5				Y	
	<i>Fragaria chiloensis</i>	50.0	1.0	0.7	0.2	4				Y	
	<i>Gamochaeta ustulata</i>	50.0	0.3	0.2	0.2	1				Y	
	<i>Achillea millefolium</i>	50.0	0.1	0.1	0.2	0.2				Y	
	<i>Deschampsia cespitosa</i>	37.5	20.4	15.0	35	45					
	<i>Hordeum brachyantherum</i>	37.5	9.7	6.9	0.2	40					
	<i>Eryngium armatum</i>	37.5	9.0	4.7	0.2	25					
	<i>Vulpia bromoides</i>	37.5	5.5	4.5	1	25					
	<i>Grindelia stricta</i>	37.5	3.4	3.3	0.2	25					
	<i>Juncus occidentalis</i>	37.5	0.9	0.7	0.2	5					
	<i>Eriogonum latifolium</i>	37.5	0.5	0.4	0.2	3					
	<i>Plantago lanceolata</i>	37.5	0.5	0.4	0.2	2					
	<i>Picris echioides</i>	37.5	0.2	0.2	0.2	1					
	<i>Anagallis arvensis</i>	37.5	0.3	0.2	0.2	1					
	<i>Camissonia ovata</i>	37.5	0.1	0.1	0.2	0.2					
	<i>Sisyrinchium bellum</i>	37.5	0.1	0.1	0.2	0.2					
	<i>Lolium perenne</i>	25.0	3.7	2.9	8	15					
	<i>Bromus hordeaceus</i>	25.0	1.1	0.9	0.2	7					
	<i>Armeria maritima</i>	25.0	0.9	0.8	1	5					
	<i>Centaurium muehlenbergii</i>	25.0	0.8	0.7	0.2	5					
	<i>Vulpia myuros</i>	25.0	0.8	0.7	0.2	5					
	<i>Juncus patens</i>	25.0	0.6	0.4	0.2	3					
	<i>Prunella vulgaris</i>	25.0	0.8	0.4	0.2	3					
	<i>Sidalcea malviflora</i>	25.0	0.3	0.3	0.2	2					
	<i>Rumex acetosella</i>	25.0	0.4	0.3	1	1					
	<i>Lotus formosissimus</i>	25.0	0.5	0.3	1	1					
	<i>Sonchus asper</i>	25.0	0.2	0.2	0.2	1					
	<i>Ranunculus californicus</i>	25.0	0.3	0.2	0.2	1					
<i>Juncus phaeocephalus</i>	25.0	0.3	0.2	0.2	1						
<i>Carex brevicaulis</i>	25.0	0.3	0.2	0.2	1						
<i>Holcus lanatus</i>	25.0	0.2	0.2	0.2	1						
<i>Plantago maritima</i>	25.0	0.4	0.2	0.2	1						
<i>Lythrum hyssopifolium</i>	25.0	0.1	0.1	0.2	0.2						

<i>Bromus carinatus</i>	25.0	0.1	0.1	0.2	0.2
<i>Carex subbracteata</i>	25.0	0.1	0.1	0.2	0.2
<i>Geranium dissectum</i>	25.0	0.1	0.1	0.2	0.2
<i>Dudleya caespitosa</i>	25.0	0.1	0.1	0.2	0.2
<i>Rumex crispus</i>	25.0	0.1	0.1	0.2	0.2

***Deschampsia (cespitosa, holciformis)* Association**

Common Name: Coast hairgrass Patches

Alliance: *Deschampsia cespitosa* – *Hordeum brachyantherum* – *Danthonia californica*
Herbaceous Alliance

Local Vegetation Description

The Coast hairgrass Association forms an intermittent to continuous herbaceous layer. The shrub layer is open and the tree layer is absent. Dominant herbs include *Deschampsia cespitosa*, and characteristic herbs include *Achillea millefolium*, *Hypochaeris radicata*, *Plantago lanceolata*, and *Sisyrinchium bellum*. Those herbs often present include *Aira caryophylla*, *Anagallis arvensis*, *Bromus hordeaceus*, *Cynosurus echinatus*, *Danthonia californica*, *Elymus glaucus*, *Eschscholzia californica*, *Koeleria macrantha*, *Nassella pulchra*, *Sidalcea malviflora*, *Vicia* spp., and *Vulpia bromoides*, and herbs that are sometimes present include *Avena* spp., *Brachypodium distachyon*, *Bromus carinatus*, *Cirsium quercetorum*, *Eriogonum latifolium*, *Festuca idahoensis*, *Fragaria chiloensis*, *Gamochaeta ustulata*, *Lasthenia californica*, *Linum bienne*, *Lolium perenne*, *Lotus corniculatus*, *Microseris bigelovii*, *Plantago erecta*, *Ranunculus californicus*, *Rumex acetosella*, *Trifolium dubium*, and *Triteleia laxa*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	2.0	0.0 – 5.0	0.3	0 – 0.5
Herb	69.8	50 – 89	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 147 m, Range 9 – 282 m

Aspect: NE (2), NW (1), SE (1)

Slope: Mean 10 degrees, Range 5 – 15 degrees

Macro Topography: Lower 1/3 of slope (1), Middle 1/3 of slope (1), Middle to Upper 1/3 of slope (1), Ridge top (1)

Large Rock: Mean 1.3%, Range 0.0 – 3.2%

Small Rock: Mean 7.9%, Range 0.2 – 30.0%

Fines Cover: Mean 32.8%, Range 1.0 – 85.0%

Litter Cover: Mean 51.5%, Range 11.0 – 92%

Soil Texture (field assessed): Coarse, loamy sand (1), Medium silt loam (1), Moderately fine clay loam (1), Not recorded (1)

Geology (field or map data): Franciscan melange (2), Sandstone (1), Sandstone,

Deschampsia (cespitosa, holciformis) Association

Deschampsia cespitosa – *Hordeum brachyantherum* – *Danthonia californica* Herbaceous Alliance

shale, and conglomerate (1), Ultramafic (type unknown) (1)

San Mateo County Watersheds: Pacifica (1)

Other Watersheds, Marin Co.: Walker Creek (2), Bolinas (1), Point Reyes (1)

Site Impacts

This association has moderate non-native plant cover (average 42.5%) relative to native cover. Non- native species that occur with highest frequency and abundance include *Aira caryophyllea*, *Anagallis arvensis*, *Avena* spp., *Brachypodium distachyon*, *Bromus hordeaceus*, *Cynosurus echinatus*, *Hypochaeris radicata*, *Linum bienne*, *Lolium perenne*, *Lotus corniculatus*, *Plantago lanceolata*, *Rumex acetosella*, *Trifolium dubium*, and *Vulpia bromoides*.

Classification Comments

The name of this association has been updated from *Deschampsia cespitosa* ssp. *holciformis* Association to conform to the names used in Oregon and Washington. Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Buck-Diaz et al. 2020, Pickart 2006

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=5; San Mateo County (n=1): SMAT0122

Marin County (n=4): HEAD0183, HEAD0222, MARIN263, PGA506

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	60.0	30.5	0.7	0.2	3				Y
	<i>Lupinus arboreus</i>	40.0	39.5	1.6	0.2	8				
Herb	<i>Deschampsia cespitosa</i>	100.0	30.6	31.0	8	45			Y	Y
	<i>Plantago lanceolata</i>	100.0	8.8	9.0	2	18				Y
	<i>Achillea millefolium</i>	100.0	1.3	1.8	0.2	8				Y
	<i>Hypochaeris radicata</i>	80.0	3.0	2.7	0.2	8				Y
	<i>Sisyrinchium bellum</i>	80.0	0.2	0.2	0.2	0.2				Y
	<i>Vulpia bromoides</i>	60.0	6.1	6.2	3	18				Y
	<i>Nassella pulchra</i>	60.0	1.8	1.4	1	3				Y
	<i>Cynosurus echinatus</i>	60.0	0.6	0.7	0.2	3				Y
	<i>Sidalcea malviflora</i>	60.0	0.5	0.5	0.2	2				Y
	<i>Danthonia californica</i>	60.0	0.2	0.2	0.2	0.4				Y

Deschampsia (cespitosa, holciformis) Association

Deschampsia cespitosa – *Hordeum brachyantherum* – *Danthonia californica* Herbaceous Alliance

<i>Elymus glaucus</i>	60.0	0.2	0.1	0.2	0.2	Y
<i>Koeleria macrantha</i>	60.0	0.2	0.1	0.2	0.2	Y
<i>Anagallis arvensis</i>	60.0	0.2	0.1	0.2	0.2	Y
<i>Bromus hordeaceus</i>	60.0	0.1	0.1	0.2	0.2	Y
<i>Aira caryophylla</i>	60.0	0.1	0.1	0.2	0.2	Y
<i>Vicia spp.</i>	60.0	0.1	0.1	0.2	0.2	Y
<i>Eschscholzia californica</i>	60.0	0.1	0.1	0.2	0.2	Y
<i>Brachypodium</i>						
<i>distachyon</i>	40.0	5.8	3.6	0.2	18	
<i>Lolium perenne</i>	40.0	2.8	4.0	0.2	20	
<i>Festuca idahoensis</i>	40.0	0.6	0.4	0.2	2	
<i>Eriogonum latifolium</i>	40.0	0.6	0.6	0.2	3	
<i>Triteleia laxa</i>	40.0	0.6	0.6	0.2	3	
<i>Lotus corniculatus</i>	40.0	0.4	0.4	0.2	2	
<i>Lasthenia californica</i>	40.0	0.3	0.2	0.2	1	
<i>Gamochaeta ustulata</i>	40.0	0.2	0.2	0.2	1	
<i>Avena spp.</i>	40.0	0.1	0.1	0.2	0.2	
<i>Bromus carinatus</i>	40.0	0.1	0.1	0.2	0.2	
<i>Linum bienne</i>	40.0	0.1	0.1	0.2	0.2	
<i>Cirsium quercetorum</i>	40.0	0.1	0.1	0.2	0.2	
<i>Trifolium dubium</i>	40.0	0.1	0.1	0.2	0.2	
<i>Microseris bigelovii</i>	40.0	0.1	0.1	0.2	0.2	
<i>Plantago erecta</i>	40.0	0.1	0.1	0.2	0.2	
<i>Ranunculus californicus</i>	40.0	0.1	0.1	0.1	0.2	
<i>Fragaria chiloensis</i>	40.0	0.1	0.1	0.2	0.2	
<i>Rumex acetosella</i>	40.0	0.1	0.1	0.2	0.2	

***Deschampsia cespitosa* – *Danthonia californica* Association**

Common Name: Tufted Hairgrass – California Oatgrass Patches

Alliance: *Deschampsia cespitosa* – *Hordeum brachyantherum* – *Danthonia californica*
Herbaceous Alliance

Local Vegetation Description

The Tufted Hairgrass – California Oatgrass Association forms a continuous herbaceous layer. The shrub layer is open and the tree layer is absent. Characteristic herbs include *Aira caryophylla*, *Anagallis arvensis*, *Briza minor*, *Danthonia californica*, *Deschampsia cespitosa*, *Holcus lanatus*, *Hypochaeris radicata*, *Plantago lanceolata*, and *Sisyrinchium bellum*. Those herbs often present include *Achillea millefolium*, *Briza maxima*, *Carex brevicaulis*, *Elymus glaucus*, *Gamochaeta ustulata*, *Linum bienne*, *Logfia gallica*, *Lolium perenne*, *Luzula comosa*, *Nassella pulchra*, *Rumex acetosella*, *Silene gallica*, and *Vulpia bromoides*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis* and *Lupinus versicolor*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0.0 – 0.2	no data	no data
Shrub	3.1	0.0 – 15.0	0.3	0 – 0.5
Herb	74.6	67 – 82	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 271 m, Range 25 – 356 m

Aspect: S (2), SE (2), NE (1)

Slope: Mean 2 degrees, Range 1 – 6 degrees

Macro Topography: Upper 1/3 of slope (3), Bottom (2)

Large Rock: 0.0%

Small Rock: 0.2%

Fines Cover: Mean 1.2%, Range 0.2 – 5.0%

Litter Cover: Mean 18.6%, Range 0.2 – 92%

Soil Texture (field assessed): Moderately fine sandy clay loam (1)

Geology (field or map data): Granitic (4), Sedimentary (type unknown) (1)

San Mateo County Watersheds: Pacifica (1)

Other Watersheds, Santa Cruz Co.: Davenport (4)

Site Impacts

This association has low non-native plant cover (average 13.3%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira*

Deschampsia cespitosa – *Danthonia californica* Association

Deschampsia cespitosa – *Hordeum brachyantherum* – *Danthonia californica* Herbaceous Alliance

caryophyllea, Anagallis arvensis, Avena spp., Briza maxima, Briza minor, Bromus hordeaceus, Cynosurus echinatus, Geranium dissectum, Holcus lanatus, Hypochaeris glabra, Hypochaeris radicata, Leontodon taraxacoides, Linum bienne, Logfia gallica, Lolium perenne, Plantago lanceolata, Rumex acetosella, Silene gallica, Trifolium dubium, Vicia sativa, and Vulpia bromoides.

Classification Comments

Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: G2 **State Rarity Rank:** S2 **State Rare:** Y

Surveys Used for Description

Total: N=5; San Mateo County (n=1): SMAT0332

Santa Cruz County (n=4): CORT123, CORT124, CORT126, CORT127

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	80.0	79.7	3.1	0.2	15		Y		Y
Herb	<i>Deschampsia cespitosa</i>	100.0	49.1	64.8	45	89			Y	Y
	<i>Danthonia californica</i>	100.0	21.6	31.2	4	53				Y
	<i>Holcus lanatus</i>	100.0	5.5	8.4	1	20				Y
	<i>Plantago lanceolata</i>	100.0	0.7	1.0	0.2	4				Y
	<i>Hypochaeris radicata</i>	100.0	0.3	0.4	0.2	1				Y
	<i>Carex spp.</i>	80.0	3.4	5.5	0.2	26				Y
	<i>Briza maxima</i>	80.0	3.2	4.6	0.2	11				Y
	<i>Lotus formosissimus</i>	80.0	1.0	1.4	0.2	4				Y
	<i>Sisyrinchium bellum</i>	80.0	0.8	1.3	0.2	5				Y
	<i>Linum bienne</i>	80.0	0.6	0.8	0.2	2				Y
	<i>Brodiaea terrestris</i>	80.0	0.1	0.2	0.2	0.2				Y
	<i>Plantago ovata</i>	60.0	1.2	1.8	0.2	6				Y
	<i>Panicum acuminatum</i>	60.0	0.9	1.4	0.2	4				Y
	<i>Juncus spp.</i>	60.0	0.3	0.5	0.2	2				Y
	<i>Cirsium vulgare</i>	60.0	0.3	0.4	0.2	1				Y
	<i>Chlorogalum pomeridianum</i>	60.0	0.2	0.3	0.2	1				Y
	<i>Anagallis arvensis</i>	60.0	0.1	0.1	0.2	0.2				Y

Deschampsia cespitosa – *Danthonia californica* Association

Deschampsia cespitosa – *Hordeum brachyantherum* – *Danthonia californica* Herbaceous Alliance

	<i>Zigadenus micranthus</i>	60.0	0.1	0.1	0.2	0.2		Y
	<i>Prunella vulgaris</i>	60.0	0.1	0.1	0.2	0.2		Y
	<i>Grindelia camporum</i>	60.0	0.1	0.1	0.2	0.2		Y
	<i>Nassella pulchra</i>	40.0	2.8	4.2	2	19		
	<i>Symphotrichum chilense</i>	40.0	1.2	1.6	0.2	8		
	<i>Juncus patens</i>	40.0	1.0	0.8	1	3		
	<i>Briza minor</i>	40.0	0.1	0.1	0.2	0.2		
Non-Vascular								
	Moss	80.0	80.0	0.2	0.2	0.2	Y	Y

***Deschampsia cespitosa* – *Eryngium armatum* Association**

Common Name: Tufted hairgrass – coastal button-celery Patches

Alliance: *Deschampsia cespitosa* – *Hordeum brachyantherum* – *Danthonia californica*
Herbaceous Alliance

Local Vegetation Description

The Tufted hairgrass – coastal button-celery Association forms an intermittent herbaceous layer. The shrub layer is sparse and the tree layer is absent. Characteristic herbs include *Deschampsia cespitosa*, *Eryngium armatum*, and *Holcus lanatus*. Those herbs often present include *Achillea millefolium*, *Aira caryophyllea*, *Briza minor*, *Cirsium quercetorum*, *Danthonia californica*, *Gamochaeta ustulata*, *Hypochaeris radicata*, *Juncus bufonius*, *Juncus phaeocephalus*, *Lolium perenne*, *Plantago lanceolata*, *Prunella vulgaris*, *Rumex acetosella*, and *Sisyrinchium bellum*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	1.1	0.2 – 2.0	0.3	0 – 0.5
Herb	46.0	39 – 54	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 13 m, Range 11 – 15 m

Aspect: Flat (2), Variable (1)

Slope: Mean 2 degrees, Range 0 – 3 degrees

Macro Topography: Ridge top (2), Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: Mean 0.1%, Range 0.0 – 0.2%

Fines Cover: Mean 84.0%, Range 67.0 – 97.0%

Litter Cover: Mean 1.3%, Range 0.0 – 3%

Soil Texture (field assessed): Fine sandy clay (1), Moderately fine clay loam (1), Sand, (class unknown) (1)

Geology (field or map data): Sedimentary (type unknown) (1), Clayey alluvium (1), Sandstone and other sedimentary (1)

San Mateo County Watersheds: Ano Nuevo (3)

Site Impacts

This association has low non-native plant cover (average 13.2%) relative to native

cover. Non-native species that occur with highest frequency and abundance include *Aira caryophylla*, *Aira praecox*, *Anagallis arvensis*, *Briza minor*, *Bromus hordeaceus*, *Geranium dissectum*, *Holcus lanatus*, *Hypochaeris radicata*, *Leontodon taraxacoides*, *Lolium perenne*, *Lotus corniculatus*, *Lythrum hyssopifolium*, *Medicago* spp., *Plantago lanceolata*, *Rumex acetosella*, and *Vulpia bromoides*.

Classification Comments

This existing association has been placed in a revised alliance.

References: Buck-Diaz et al. 2020, Klein et al. 2015

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=3; San Mateo County (n=3): SMAT0644, SMAT0648, SMAT0681

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	100.0	80.3	1.1	0.2	2		Y		Y
	<i>Lupinus versicolor</i>	33.3	16.7	0.3	1	1				
	<i>Lupinus arboreus</i>	33.3	3.0	0.1	0.2	0.2				
Herb	<i>Eryngium armatum</i>	100.0	24.0	12.4	0.2	25				Y
	<i>Danthonia californica</i>	100.0	10.9	5.4	0.2	15				Y
	<i>Juncus bufonius</i>	100.0	4.4	1.8	0.2	5				Y
	<i>Anagallis arvensis</i>	100.0	0.9	0.5	0.2	1				Y
	<i>Gamochaeta ustulata</i>	100.0	0.4	0.2	0.2	0.2				Y
	<i>Prunella vulgaris</i>	66.7	2.2	1.1	0.2	3				Y
	<i>Lotus formosissimus</i>	66.7	1.3	0.7	1	1				Y
	<i>Plantago maritima</i>	66.7	1.0	0.4	0.2	1				Y
	<i>Hypochaeris radicata</i>	66.7	1.0	0.4	0.2	1				Y
	<i>Carex brevicaulis</i>	66.7	0.8	0.4	0.2	1				Y
	<i>Juncus phaeocephalus</i>	66.7	0.7	0.4	0.2	1				Y
	<i>Ranunculus californicus</i>	66.7	0.7	0.4	0.2	1				Y
	<i>Carex subbracteata</i>	66.7	0.3	0.1	0.2	0.2				Y
	<i>Dudleya caespitosa</i>	66.7	0.3	0.1	0.2	0.2				Y
	<i>Juncus occidentalis</i>	66.7	0.3	0.1	0.2	0.2				Y
	<i>Geranium dissectum</i>	66.7	0.3	0.1	0.2	0.2				Y
<i>Camissonia ovata</i>	66.7	0.3	0.1	0.2	0.2				Y	
<i>Sisyrinchium bellum</i>	66.7	0.3	0.1	0.2	0.2				Y	
<i>Deschampsia cespitosa</i>	33.3	20.0	11.7	35	35					

Deschampsia cespitosa – *Eryngium armatum* Association

Deschampsia cespitosa – *Hordeum brachyantherum* – *Danthonia californica* Herbaceous Alliance

<i>Triphysaria versicolor</i>	33.3	7.5	3.0	9	9
<i>Lotus corniculatus</i>	33.3	6.7	2.7	8	8
<i>Isolepis cernua</i>	33.3	6.7	2.7	8	8
<i>Polycarpon tetraphyllum</i>	33.3	0.8	0.3	1	1
<i>Melilotus spp.</i>	33.3	0.8	0.3	1	1
<i>Plantago coronopus</i>	33.3	0.8	0.3	1	1
<i>Armeria maritima</i>	33.3	0.8	0.3	1	1
<i>Rumex acetosella</i>	33.3	0.6	0.3	1	1
<i>Plantago lanceolata</i>	33.3	0.6	0.3	1	1
<i>Bromus carinatus</i>	33.3	0.2	0.1	0.2	0.2
<i>Sonchus asper</i>	33.3	0.2	0.1	0.2	0.2
<i>Vulpia myuros</i>	33.3	0.2	0.1	0.2	0.2
<i>Centaureum davyi</i>	33.3	0.2	0.1	0.2	0.2
<i>Holcus lanatus</i>	33.3	0.2	0.1	0.2	0.2
<i>Silene gallica</i>	33.3	0.2	0.1	0.2	0.2
<i>Eriogonum latifolium</i>	33.3	0.2	0.1	0.2	0.2
<i>Castilleja affinis</i>	33.3	0.2	0.1	0.2	0.2
<i>Rumex salicifolius</i>	33.3	0.2	0.1	0.2	0.2
<i>Camissonia cheiranthifolia</i>	33.3	0.2	0.1	0.2	0.2
<i>Brachypodium distachyon</i>	33.3	0.2	0.1	0.2	0.2
<i>Fragaria chiloensis</i>	33.3	0.2	0.1	0.2	0.2
<i>Schoenoplectus americanus</i>	33.3	0.2	0.1	0.2	0.2
<i>Artemisia pycnocephala</i>	33.3	0.2	0.1	0.2	0.2
<i>Cerastium arvense</i>	33.3	0.1	0.1	0.2	0.2
<i>Luzula comosa</i>	33.3	0.1	0.1	0.2	0.2
<i>Lotus spp.</i>	33.3	0.1	0.1	0.2	0.2
<i>Juncus patens</i>	33.3	0.1	0.1	0.2	0.2
<i>Cirsium quercetorum</i>	33.3	0.1	0.1	0.2	0.2
<i>Grindelia stricta</i>	33.3	0.1	0.1	0.2	0.2
<i>Sidalcea malviflora</i>	33.3	0.1	0.1	0.2	0.2
<i>Spiranthes romanzoffiana</i>	33.3	0.1	0.1	0.2	0.2
<i>Trifolium spp.</i>	33.3	0.1	0.1	0.2	0.2
<i>Briza maxima</i>	33.3	0.1	0.1	0.2	0.2
<i>Pelargonium grossularioides</i>	33.3	0.1	0.1	0.2	0.2
<i>Sonchus spp.</i>	33.3	0.1	0.1	0.2	0.2
<i>Picris echioides</i>	33.3	0.1	0.1	0.2	0.2
<i>Festuca spp.</i>	33.3	0.1	0.1	0.2	0.2
<i>Grindelia spp.</i>	33.3	0.1	0.1	0.2	0.2
<i>Hemizonia spp.</i>	33.3	0.1	0.1	0.2	0.2
<i>Achillea millefolium</i>	33.3	0.1	0.1	0.2	0.2
<i>Chlorogalum pomeridianum</i>	33.3	0.1	0.1	0.2	0.2

Deschampsia cespitosa – *Eryngium armatum* Association

Deschampsia cespitosa – *Hordeum brachyantherum* – *Danthonia californica* Herbaceous Alliance

<i>Lythrum hyssopifolium</i>	33.3	0.1	0.1	0.2	0.2
<i>Plantago erecta</i>	33.3	0.1	0.1	0.2	0.2

***Hordeum brachyantherum* Lowland Association**

Common Name: Meadow Barley Lowland Wet Meadow Patches

Alliance: *Deschampsia cespitosa* – *Hordeum brachyantherum* – *Danthonia californica*
Herbaceous Alliance

Local Vegetation Description

The Meadow Barley Lowland Wet Meadow Association forms a continuous herbaceous layer. The shrub layer is open and the tree layer is sparse. Dominant herbs include *Hordeum brachyantherum* and *Lolium perenne*. Those herbs that are sometimes present include *Achillea millefolium*, *Avena* spp., *Bromus diandrus*, *Holcus lanatus*, *Hordeum marinum*, *Nassella pulchra*, and *Sisyrinchium bellum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	1.5	0 – 3	7.5	5 – 10
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	8.5	7.0 – 10.0	0.9	0 – 2
Herb	75.5	69 – 82	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 153 m, Range 9 – 267 m

Aspect: NW (4), Flat (1), SE (1)

Slope: Mean 5 degrees, Range 0 – 15 degrees

Macro Topography: Bottom (3), Bench (1), Bottom to Lower 1/3 of slope (1), Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.2%

Fines Cover: Mean 1.8%, Range 0.2 – 5.0%

Litter Cover: Mean 30.9%, Range 0.2 – 92%

Soil Texture (field assessed): Moderately fine clay loam (1), Sand, (class unknown) (1)

Geology (field or map data): Sandstone and other sedimentary (4), Sand dunes (1), Sedimentary (type unknown) (1)

San Mateo County Watersheds: Ano Nuevo (1), Tunitas Creek (1)

Other Watersheds, Santa Clara Co.: Guadalupe River (4)

Site Impacts

This association has greater cover of non-native (average 54.1%) than native. Non-native species that occur with highest frequency and abundance include *Bromus diandrus*, *Hordeum marinum*, *Lolium perenne*, and *Lotus corniculatus*.

Classification Comments

This association is revised by separating these lowland surveys from montane ones, and placing the association in this revised alliance. Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Buck-Diaz et al. 2011, Buck-Diaz et al. 2012, Buck-Diaz et al. 2013, Kittel et al. 2012, Klein et al. 2015, Rodriguez et al. 2017

Global Rarity Rank: G2

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=6; San Mateo County (n=2): SMAT0121, SMATREL0169

Santa Clara County (n=4): CORT091, CORT092, CORT093, CORT094

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Hesperocyparis macrocarpa</i>	33.3	33.3	1.0	3	3				
Shrub	<i>Baccharis pilularis</i>	100.0	100.0	6.0	1	10		Y		Y
Herb	<i>Hordeum brachyantherum</i>	100.0	25.9	18.4	0.2	40				Y
	<i>Lotus corniculatus</i>	66.7	12.4	8.4	0.2	25				Y
	<i>Vulpia bromoides</i>	66.7	11.3	8.7	1	25				Y
	<i>Rumex crispus</i>	66.7	0.2	0.1	0.2	0.2				Y
	<i>Oenothera elata</i>	33.3	17.3	13.3	40	40				
	<i>Hordeum marinum</i>	33.3	6.1	5.0	15	15				
	<i>Lolium perenne</i>	33.3	6.1	5.0	15	15				
	<i>Danthonia californica</i>	33.3	4.0	3.3	10	10				
	<i>Bromus hordeaceus</i>	33.3	2.8	2.3	7	7				
	<i>Centaurium muehlenbergii</i>	33.3	2.2	1.7	5	5				
	<i>Juncus occidentalis</i>	33.3	2.0	1.7	5	5				
	<i>Vulpia myuros</i>	33.3	2.0	1.7	5	5				
	<i>Bromus diandrus</i>	33.3	1.2	1.0	3	3				
	<i>Epilobium densiflorum</i>	33.3	0.9	0.7	2	2				
	<i>Foeniculum vulgare</i>	33.3	0.8	0.7	2	2				
	<i>Fragaria chiloensis</i>	33.3	0.5	0.3	1	1				
	<i>Picris echioides</i>	33.3	0.4	0.3	1	1				
	<i>Madia sativa</i>	33.3	0.4	0.3	1	1				

Hordeum brachyantherum Lowland Association

Deschampsia cespitosa – *Hordeum brachyantherum* – *Danthonia californica* Herbaceous Alliance

<i>Raphanus sativus</i>	33.3	0.4	0.3	1	1
<i>Sonchus asper</i>	33.3	0.4	0.3	1	1
<i>Potentilla glandulosa</i>	33.3	0.4	0.3	1	1
<i>Rumex acetosella</i>	33.3	0.4	0.3	1	1
<i>Brassica rapa</i>	33.3	0.4	0.3	1	1
<i>Vicia sativa</i>	33.3	0.4	0.3	1	1
<i>Juncus bufonius</i>	33.3	0.1	0.1	0.2	0.2
<i>Hypochaeris radicata</i>	33.3	0.1	0.1	0.2	0.2
<i>Sonchus oleraceus</i>	33.3	0.1	0.1	0.2	0.2
<i>Achillea millefolium</i>	33.3	0.1	0.1	0.2	0.2
<i>Cirsium vulgare</i>	33.3	0.1	0.1	0.2	0.2
<i>Lythrum hyssopifolium</i>	33.3	0.1	0.1	0.2	0.2
<i>Polypogon monspeliensis</i>	33.3	0.1	0.1	0.2	0.2
<i>Bromus carinatus</i>	33.3	0.1	0.1	0.2	0.2
<i>Scrophularia californica</i>	33.3	0.1	0.1	0.2	0.2
<i>Spergularia villosa</i>	33.3	0.1	0.1	0.2	0.2
<i>Trifolium angustifolium</i>	33.3	0.1	0.1	0.2	0.2
<i>Vicia villosa</i>	33.3	0.1	0.1	0.2	0.2

***Distichlis spicata* Herbaceous Alliance**



Common Name: Salt grass flats

NVC Alliance Code: A1332. *Distichlis spicata* Alkaline Wet Meadow Alliance

Statewide Description

Distichlis spicata is dominant or co-dominant in the herbaceous layer with *Agrostis viridis*, *Ambrosia chamissonis*, *Anemopsis californica*, *Atriplex prostrata*, *Batis maritima*, *Bromus diandrus*, *Cotula coronopifolia*, *Eleocharis palustris*, *Frankenia salina*, *Hordeum brachyantherum*, *Hordeum murinum*, *Jaumea carnosa*, *Juncus arcticus*, *Juncus cooperi*, *Lepidium latifolium*, *Leymus triticoides*, *Limonium californicum*, *Muhlenbergia asperifolia*, *Parapholis strigosa*, *Pascopyrum smithii*, *Poa secunda*, *Puccinellia nuttalliana*, *Sarcocornia pacifica*, *Sporobolus airoides*, and *Triglochin maritima*. Emergent shrubs may be present at low cover, including *Allenrolfea occidentalis*, *Atriplex* spp., *Ericameria albida*, *Ericameria nauseosa*, *Sarcobatus vermiculatus*, or *Suaeda moquinii*.

The alliance is commonly found in alkaline or saline environments from the coast to the mountains and deserts of California. Zedler et al. (1999) stated that elevation profiles and vegetation patterns do not always correlate with discrete zonation in coastal marshes, but they recognize three habitats: high marsh, marsh plain, cord grass. *Distichlis spicata* vegetation types are part of the marsh plain habitat.

The National Vegetation Classification (NVC) has two distinct alliances dominated by

Distichlis spicata Herbaceous Alliance

Distichlis spicata for California (NatureServe 2021), which are placed in different groups according to their ecoregional distribution. It is undecided at this time whether we will split this into distinct alliances. More data analysis across the state is needed before additional changes are made.

Local Vegetation Description

The Salt grass flats Alliance forms a continuous herbaceous layer. The shrub layer is sparse and the tree layer is absent. Dominant herbs include *Distichlis spicata*. Those herbs often present include *Grindelia stricta*, *Juncus arcticus*, and *Potentilla anserina*, and herbs that are sometimes present include *Atriplex prostrata*, *Frankenia salina*, *Jaumea carnosa*, *Lotus corniculatus*, *Polypogon monspeliensis*, *Sarcocornia pacifica*, and *Schoenoplectus pungens*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0.0 – 0.0	no data	no data
Shrub	0.8	0.0 – 5.0	0.8	0.5 – 1
Herb	87.5	80 – 95	0.3	0 – 0.5

Local Membership Rule

Distichlis spicata dominates or co-dominates with *Frankenia salina* and/or *Jaumea carnosa*. Non-native grasses including *Avena* spp. and *Bromus hordeaceus* may have high cover and *Sarcocornia pacifica* may be present as a sub-dominant.

Local Environmental Description

Elevation: Mean 8 m, Range 1 – 15 m

Aspect: Flat (4), SW (2), S (1)

Slope: Mean 1 degrees, Range 0 – 5 degrees

Macro Topography: Bottom (6), Lower 1/3 of slope (1)

Large Rock: Mean 0.3%, Range 0.0 – 2.0%

Small Rock: 0.0%

Fines Cover: Mean 25.7%, Range 0.0 – 90.0%

Litter Cover: Mean 56.2%, Range 0.2 – 97%

Soil Texture (field assessed): Muck (3), Fine sand (2), Sand, (class unknown) (1)

Geology (field or map data): Sandy alluvium (most alluvial fans and washes) (2), Mixed alluvium (2), Sand dunes (2), Sandstone and other sedimentary (1)

San Mateo County Watersheds: Ano Nuevo (3), Pescadero Creek (2), Palo Alto (1), San Gregorio Creek (1)

Site Impacts

This alliance has low non-native plant cover (average 4.8%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Atriplex*
Distichlis spicata Herbaceous Alliance

prostrata, *Lotus corniculatus*, and *Polypogon monspeliensis*.

Associations in San Mateo County

- *Distichlis spicata* – (*Sarcocornia pacifica*)
- *Distichlis spicata* – *Frankenia salina* – *Jaumea carnosa*

Classification Comments

None.

References: Atwater et al. 1979, Buck-Diaz and Evens 2011b, Buck-Diaz et al. 2011, Buck-Diaz et al.

2012, Buck-Diaz et al. 2013, Hickson and Keeler-Wolf 2007, Junak et al. 2007, Keeler-Wolf and Vaghti 2000, Keeler-Wolf et al. 2003a, Klein et al. 2015, Newton 1989, Rodriguez et al. 2017, Sproul et al. 2011

Global Rarity Rank: GNR **State Rarity Rank:** S4

Surveys Used for Description

Total: N=7; San Mateo County (n=7): CORT013, SMAT0128, SMAT0130, SMAT0192, SMAT0265, SMAT0300, SMATREL0167

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Distichlis spicata</i>	100.0	46.1	46.0	10	70	Y		Y	Y
	<i>Potentilla anserina</i>	57.1	18.5	16.1	5	70				Y
	<i>Grindelia stricta</i>	57.1	3.4	3.1	2	10				Y
	<i>Juncus arcticus</i>	57.1	1.5	1.3	0.2	4				Y
	<i>Lotus corniculatus</i>	42.9	3.6	7.6	0.2	53				
	<i>Sarcocornia pacifica</i>	42.9	6.1	5.6	0.2	24				
	<i>Schoenoplectus pungens</i>	42.9	3.6	3.1	1	20				
	<i>Frankenia salina</i>	42.9	1.0	0.9	0.2	6				
	<i>Atriplex prostrata</i>	42.9	0.5	0.5	0.2	3				
	<i>Jaumea carnosa</i>	28.6	1.6	1.5	0.2	10				
	<i>Polypogon monspeliensis</i>	28.6	0.2	0.2	0.2	1				

***Distichlis spicata* – (*Sarcocornia pacifica*) Association**

Common Name: Saltgrass – (Pacific Glasswort) Patches

Alliance: *Distichlis spicata* Herbaceous Alliance

Local Vegetation Description

The Saltgrass – (Pacific Glasswort) Association forms a continuous herbaceous layer. The shrub layer is absent and the tree layer is absent. Dominant herbs include *Distichlis spicata*, and characteristic herbs include *Sarcocornia pacifica*. Those herbs often present include *Jaumea carnosa*, and herbs that are sometimes present include *Cotula coronopifolia*, *Frankenia salina*, *Grindelia stricta*, *Spartina foliosa*, and *Triglochin maritima*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.0	0 – 0	no data	no data
Herb	92.5	90 – 95	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 5 m, Range 1 – 8 m

Aspect: Flat (2)

Slope: Mean 0 degrees, Range 0 – 0 degrees

Macro Topography: Bottom (2)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 10.0%, Range 0.0 – 20.0%

Litter Cover: Mean 86.0%, Range 75.0 – 97%

Soil Texture (field assessed): Muck (2)

Geology (field or map data): Mixed alluvium (1), Sandy alluvium (most alluvial fans and washes) (1)

San Mateo County Watersheds: Palo Alto (1), Pescadero Creek (1)

Site Impacts

This association has very low non-native plant cover (average 0.2%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Cotula coronopifolia*.

Classification Comments

The name of this vegetation type has been updated from *Distichlis spicata* – *Sarcocornia*

Distichlis spicata – (*Sarcocornia pacifica*) Association
Distichlis spicata Herbaceous Alliance

pacifica Association to better match the NVC.

References: Atwater et al. 1979, Hickson and Keeler-Wolf 2007, Newton 1989

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=2; San Mateo County (n=2): SMAT0130, SMAT0192

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Distichlis spicata</i>	100.0	71.9	67.0	64	70		Y		Y
	<i>Sarcocornia pacifica</i>	100.0	21.1	19.5	15	24				Y
	<i>Grindelia stricta</i>	100.0	6.3	6.0	2	10				Y
	<i>Jaumea carnosa</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Salsola soda</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Spartina foliosa</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Cuscuta salina</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Frankenia salina</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Atriplex prostrata</i>	50.0	0.1	0.1	0.2	0.2				Y

***Distichlis spicata* – *Frankenia salina* – *Jaumea carnosa* Association**

Common Name: Salt Grass – Alkali Heath – Jaumea Patches

Alliance: *Distichlis spicata* Herbaceous Alliance

Local Vegetation Description

The Salt Grass – Alkali Heath – Jaumea Association forms a continuous herbaceous layer in the single survey available. The shrub layer is absent and the tree layer is absent. Dominant herbs include *Distichlis spicata*, and characteristic herbs include *Jaumea carnosa* and *Sarcocornia pacifica*. Those herbs often present include *Frankenia salina* and *Limonium californicum*, and herbs that are sometimes present include *Cordylanthus maritimus*, *Plantago maritima*, *Triglochin concinna*, and *Triglochin maritima*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	NA	no data	no data
Hardwood	0.0	NA	no data	no data
Regenerating or Shrubby Tree	0.0	NA	no data	no data
Shrub	0.0	NA	no data	no data
Herb	90.0	NA	0.3	0 – 0.5

Local Environmental Description

Elevation: 12 m

Aspect: SW (1)

Slope: 2 degrees

Macro Topography: Bottom (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: 5.0%

Litter Cover: 92%

Soil Texture (field assessed): Muck (1)

Geology (field or map data): Mixed alluvium (1)

San Mateo County Watersheds: Ano Nuevo (1)

Site Impacts

This association has low non-native plant cover (average 3.3%) relative to native cover.

Classification Comments

None.

References: Keeler-Wolf et al. 2003a, Klein et al. 2015, Rodriguez et al. 2017

Global Rarity Rank: G3

State Rarity Rank: S2.2

State Rare: Y

Surveys Used for Description

Total: N=1; San Mateo County (n=1): SMAT0300

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Distichlis spicata</i>	100.0	77.8	70.0	70	70		Y		Y
	<i>Potentilla anserina</i>	100.0	8.9	8.0	8	8				Y
	<i>Frankenia salina</i>	100.0	6.7	6.0	6	6				Y
	<i>Juncus arcticus</i>	100.0	3.3	3.0	3	3				Y
	<i>Atriplex prostrata</i>	100.0	3.3	3.0	3	3				Y

***Eichhornia crassipes* – *Ludwigia* (*hexapetala*, *peplodes*) Herbaceous Provisional Semi-Natural Alliance**



Common Name: Water hyacinth – water primrose wetlands
NVC Alliance Code: N/A.

Statewide Description

Eichhornia crassipes, *Ludwigia hexapetala*, *Ludwigia peploides* ssp. *montevidensis* or other *Ludwigia* species are dominant as emergent or floating plants on the water surface. *Azolla* spp., algae, *Sparganium*, *Polygonum* spp. and other hydrophytic plants are often present.

Plants create dense mats in shallow water and over wet soil, occurring alone or with natives such as *Azolla filiculoides*, *Hydrocotyle ranunculoides*, and *Schoenoplectus acutus*. These plants clog river waterways, lakes, irrigation canals, and agricultural wetland areas, and the mats threaten agriculture and federal water delivery projects. *Ludwigia* species compete with native plants, eliminate open water habitat, and reduce oxygen levels critical for fish survival. The mats also pose a public health threat as a habitat for mosquitoes that carry West Nile virus (Sears et al. 2005). Efforts to remove dense, spreading stands of *Ludwigia hexapetala* are underway, especially in the Russian River watershed, through a *Ludwigia* Task Force (Sears et al. 2005, 2006).

Local Vegetation Description

The Water hyacinth – water primrose wetlands Alliance forms an intermittent to

continuous herbaceous layer. The shrub layer is absent and the tree layer is absent. Dominant herbs include *Ludwigia* spp.

Those herbs often present include *Myriophyllum aquaticum*, and herbs that are sometimes present include *Azolla filiculoides*, *Carduus pycnocephalus*, *Eleocharis macrostachya*, *Polygonum punctatum*, *Polypogon monspeliensis*, and *Stuckenia pectinata*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.0	0 – 0	no data	no data
Herb	68.3	50 – 95	0.3	0 – 0.5

Local Membership Rule

Ludwigia hexapetala or *L. peploides* dominates, creating mats in shallow water or over wet soil. Other aquatic plants such as *Azolla*, *Lemna*, *Myriophyllum aquaticum*, *Polygonum*, and *Sparganium* may be present.

Local Environmental Description

Elevation: Mean 103 m, Range 60 – 143 m

Aspect: Flat (3)

Slope: Mean 1 degrees, Range 0 – 2 degrees

Macro Topography: Bottom (2), Bottom to Lower 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 4.0%, Range 0.0 – 12%

Litter Cover: Mean 0.3%, Range 0.0 – 1%

Soil Texture (field assessed): Muck (2), Not recorded (1)

Geology (field or map data): Sandstone and other sedimentary (1)

San Mateo County Watersheds: Palo Alto (1)

Other Watersheds, Marin Co.: Lagunitas Creek (1), Novato (1)

Site Impacts

This alliance has greater cover of exotics than natives, non-native plant cover (average 69.5%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Carduus pycnocephalus*, *Myriophyllum aquaticum*, and *Polypogon monspeliensis*.

Associations in San Mateo County

- *Ludwigia (hexapetala, peploides)*

Classification Comments

Eichhornia crassipes – *Ludwigia (hexapetala, peploides)* Herbaceous Provisional Semi-Natural Alliance

Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: Buck-Diaz et al. 2012, Hickson and Keeler-Wolf 2007, Klein et al. 2015

Global Rarity Rank: GNA **State Rarity Rank:** SNA

Surveys Used for Description

Total: N=3; San Mateo County (n=1): SMAT0240

Marin County (n=2): MARIN052, MARIN124

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Ludwigia spp.</i>	100.0	84.0	60.3	46	80	Y	Y		Y
	<i>Myriophyllum aquaticum</i>	66.7	11.3	9.0	12	15				Y
	<i>Polygonum punctatum</i>	33.3	2.6	1.3	4	4				
	<i>Azolla filiculoides</i>	33.3	1.1	1.0	3	3				
	<i>Eleocharis macrostachya</i>	33.3	0.6	0.3	1	1				
	<i>Polypogon monspeliensis</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Carduus pycnocephalus</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Stuckenia pectinata</i>	33.3	0.1	0.1	0.2	0.2				

***Ludwigia (hexapetala, peploides)* Provisional Semi-natural Association**

Common Name: Water primrose wetlands Patches

Alliance: *Eichhornia crassipes* – *Ludwigia (hexapetala, peploides)* Herbaceous Provisional Semi- Natural Alliance

Classification Comments

The association circumscription is the same as that of the alliance for the county. See above for detailed description.

References: Buck-Diaz et al. 2012, Hickson and Keeler-Wolf 2007, Klein et al. 2015

Global Rarity Rank: GNA **State Rarity Rank:** SNA **State Rare:** N

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Ludwigia spp.</i>	100.0	84.0	60.3	46	80		Y		Y
	<i>Myriophyllum aquaticum</i>	66.7	11.3	9.0	12	15				Y
	<i>Polygonum punctatum</i>	33.3	2.6	1.3	4	4				
	<i>Azolla filiculoides</i>	33.3	1.1	1.0	3	3				
	<i>Eleocharis macrostachya</i>	33.3	0.6	0.3	1	1				
	<i>Carduus pycnocephalus</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Polypogon monspeliensis</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Stuckenia pectinata</i>	33.3	0.1	0.1	0.2	0.2				

***Eleocharis (acicularis, macrostachya)* Herbaceous Alliance**



Common Name: Needle spike rush and pale spike rush marshes

NVC Alliance Code: A3807. *Eleocharis palustris* - *Eleocharis acicularis* Marsh Alliance

Statewide Description

Sawyer et al. (2009) treated *Eleocharis acicularis* and *E. macrostachya* in separate alliances, however a recent peer review panel of the NVC has determined that these species should be merged into a single alliance due to similar ecological conditions and overlapping species. The treatment below incorporates these new changes.

Eleocharis acicularis and/or *E. macrostachya* dominate or co-dominate in the herbaceous layer with *Agrostis stolonifera*, *Alopecurus geniculatus*, *Argentina egedii*, *Arnica chamissonis*, *Carex* spp., *Damasonium californicum*, *Deschampsia danthonioides*, *Eleocharis acicularis*, *Eleocharis macrostachya*, *Epilobium pallidum*, *Epilobium pygmaeum*, *Eryngium alismifolium*, *Eryngium aristulatum*, *Eryngium castrense*, *Eryngium mathiasiae*, *Eryngium vaseyi*, *Isoetes howellii*, *Juncus arcticus*, *Juncus nevadensis*, *Lasthenia glaberrima*, *Lemna minuta*, *Lolium perenne*, *Marsilea vestita*, *Mimulus guttatus*, *Muhlenbergia filiformis*, *Nasturtium officinale*, *Navarretia intertexta*, *Navarretia leucocephala*, *Paspalum dilatatum*, *Perideridia parishii*, *Plagiobothrys mollis*, *Polygonum* spp., *Psilocarphus oregonus*, *Ranunculus aquatilis*, *Ranunculus muricatus*, and *Trifolium wormskioldii*.

Eleocharis acicularis and *E. macrostachya* occur separately or together in a variety of

Eleocharis (acicularis, macrostachya) Herbaceous Alliance

temporarily flooded or saturated sites in California. S. Smith (1998) described stands of *E. acicularis* co-dominant with other early-seral herbs, resulting from long-term grazing and natural disturbance. However, Klein et al. (2007) found stable, vernal moist *Eleocharis acicularis* stands in locations without major disturbances. A related type is the *Eleocharis acicularis* sub-association of the *Downingia insignis* – *Psilocarphus brevissimus*

Association, which is found in alkaline claypan vernal pools in the Solano–Colusa region (Barbour et al. 2007b). *Eleocharis macrostachya* grows in many seasonally flooded habitats including vernal pools, brackish marshes, ponds, shallow lakes, stream sides, and wet meadows. *Eleocharis macrostachya* stands exist throughout much of the western United States and central Great Plains at elevations from sea level to alpine in shallow wetlands with slowed water or in ponds (NatureServe 2007a, Smith et al. 2002).

Local Vegetation Description

The Needle spike rush and pale spike rush marshes Alliance forms an open to continuous herbaceous layer. The shrub layer is absent and the tree layer is absent. Those herbs often present include *Eleocharis macrostachya*, and herbs that are sometimes present include *Cyperus eragrostis*, *Holcus lanatus*, *Juncus bufonius*, *Juncus patens*, *Juncus phaeocephalus*, *Leontodon taraxacoides*, *Lolium perenne*, *Lotus* spp., *Lythrum hyssopifolium*, *Mentha pulegium*, *Picris echioides*, *Polypogon monspeliensis*, and *Rumex crispus*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0.0 – 0.0	no data	no data
Shrub	0.0	0.0 – 0.0	no data	no data
Herb	82.1	26 – 100	0.4	0 – 1

Local Membership Rule

Eleocharis macrostachya dominates in the herbaceous layer along lakeshores, streambeds, swales, pastures, ditches, and ponds. *Juncus phaeocephalus* and *J. patens* may also be present. If *Lasthenia glaberrima* or *Pleuropogon californicus* have high cover, key to the *L. glaberrima* Alliance.

Local Environmental Description

Elevation: Mean 37 m, Range 2 – 186 m

Aspect: Flat (6), SE (2)

Slope: Mean 1 degrees, Range 0 – 8 degrees

Macro Topography: Bottom (3), Lower 1/3 of slope (2), Bottom to Lower 1/3 of slope (1), Edge of basin/wetland (1), Upper 1/3 of slope (1)

Large Rock: Mean 0.1%, Range 0.0 – 1.0%

Small Rock: Mean 0.1%, Range 0.0 – 1.0%

Fines Cover: Mean 15.2%, Range 0.0 – 56.0%

Litter Cover: Mean 65.1%, Range 0.2 – 97%

Soil Texture (field assessed): Medium to very fine, loamy sand (3), Muck (2), Fine silty clay (1), Fine clay (1)

Geology (field or map data): Alluvium (4), Sandstone and other sedimentary (2), Clayey alluvium (1), Franciscan melange (1), Large landslides (1), Silty alluvium (1)

San Mateo County Watersheds: Tunitas Creek (2)

Other Watersheds, Marin Co.: Novato (4), Lagunitas Creek (1), Petaluma River (1), Point Reyes (1), Walker Creek (1)

Site Impacts

This alliance has moderate non-native plant cover (average 30.3%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Holcus lanatus*, *Leontodon taraxacoides*, *Lythrum hyssopifolium*, *Mentha pulegium*, *Picris echioides*, *Polypogon monspeliensis*, and *Rumex crispus*.

Associations in San Mateo County

- *Eleocharis macrostachya*

Classification Comments

Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: Boul et al. 2021, Buck-Diaz and Evens 2011b, Buck-Diaz et al. 2011, Buck-Diaz et al. 2012, Buck-Diaz et al. 2013, Buck-Diaz et al. 2020, CNPS Vegetation Program 2015, Kittel et al. 2012, Klein et al. 2007, Klein et al. 2015, Pickart 2006, Potter 2005, Smith 1998b

Global Rarity Rank: GNR

State Rarity Rank: S3S4

Surveys Used for Description

Total: N=10; San Mateo County (n=2): SMATREL0117, SMATREL0165

Marin County (n=8): MARIN233, MARIN412, MARIN414, MARIN416, MTBP009, PGA3775, PGA6646, PORE178

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Eleocharis macrostachya</i>	100.0	51.1	46.8	6	95	Y	Y		Y
	<i>Rumex crispus</i>	70.0	1.9	2.0	0.2	10				Y

Eleocharis (acicularis, macrostachya) Herbaceous Alliance

<i>Polypogon monspeliensis</i>	50.0	6.2	7.1	0.2	48	Y
<i>Mentha pulegium</i>	40.0	8.0	8.7	0.2	42	
<i>Juncus phaeocephalus</i>	40.0	5.3	5.5	0.2	40	
<i>Lolium perenne</i>	40.0	6.4	4.5	0.2	25	
<i>Atriplex prostrata</i>	30.0	1.4	1.8	0.2	18	
<i>Xanthium strumarium</i>	30.0	0.2	0.2	0.2	2	
<i>Bidens frondosa</i>	30.0	0.1	0.1	0.2	0.2	
<i>Lythrum hyssopifolium</i>	30.0	0.1	0.1	0.2	0.2	
<i>Holcus lanatus</i>	20.0	3.4	5.0	10	40	
<i>Bolboschoenus maritimus</i>	20.0	2.2	2.2	2	20	
<i>Raphanus sativus</i>	20.0	1.5	2.0	0.2	20	
<i>Paspalum distichum</i>	20.0	2.1	2.0	0.2	20	
<i>Lotus spp.</i>	20.0	0.4	0.5	0.2	5	
<i>Juncus patens</i>	20.0	0.3	0.4	0.2	4	
<i>Cyperus eragrostis</i>	20.0	0.4	0.3	1	2	
<i>Leontodon taraxacoides</i>	20.0	0.3	0.1	0.2	1	
<i>Distichlis spicata</i>	20.0	0.1	0.1	0.2	1	
<i>Picris echioides</i>	20.0	0.0	0.0	0.2	0.2	
<i>Juncus bufonius</i>	20.0	0.1	0.0	0.2	0.2	
<i>Deschampsia danthonioides</i>	20.0	0.0	0.0	0.2	0.2	

***Eleocharis macrostachya* Association**

Common Name: Common spikerush Patches

Alliance: *Eleocharis (acicularis, macrostachya)* Herbaceous Alliance

Local Vegetation Description

The Common spikerush Association forms a continuous herbaceous layer. The shrub layer is absent and the tree layer is absent. The dominant herb is *Eleocharis macrostachya*. Herbs often present include *Epilobium ciliatum*, *Heliotropium curassavicum*, *Holcus lanatus*, *Hypochaeris radicata*, *Juncus phaeocephalus*, *Lolium perenne*, *Lotus* spp., *Lythrum hyssopifolium*, *Mentha pulegium*, *Picris echioides*, *Polygonum* spp., *Polypogon monspeliensis*, *Rumex crispus*. and *Rumex salicifolius*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.0	0.0 – 0.0	no data	no data
Herb	92.5	90 – 95	0.8	0 – 1

Local Environmental Description

Elevation: Mean 19 m, Range 18 – 20 m

Aspect: Flat (2)

Slope: Mean 0 degrees, Range 0 – 0 degrees

Macro Topography: Bottom (1), Lower 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 1.6%, Range 0.2 – 3.0%

Litter Cover: Mean 95%, Range 94 – 96%

Soil Texture (field assessed): Muck (1), Fine clay (1)

Geology (field or map data): Alluvium (1), Silty alluvium (1)

San Mateo County Watersheds: Tunitas Creek (2)

Site Impacts

This association has low non-native plant cover (average 9.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Holcus lanatus*, *Lolium perenne*, *Lythrum hyssopifolium*, *Mentha pulegium*, *Picris echioides*, *Polypogon monspeliensis*, and *Rumex crispus*.

Classification Comments

None.

Eleocharis macrostachya Association
Eleocharis (acicularis, macrostachya) Herbaceous Alliance

References: Boul et al. 2021, Buck-Diaz and Evens 2011b, Buck-Diaz et al. 2011, Buck-Diaz et al. 2012, Buck-Diaz et al. 2013, Buck-Diaz et al. 2020, CNPS Vegetation Program 2015, Kittel et al. 2012, Klein et al. 2007, Klein et al. 2015, Pickart 2006, Potter 2005, Smith 1998b

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: N

Surveys Used for Description

Total: N=2; San Mateo County (n=2): SMATREL0117, SMATREL0165

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Eleocharis macrostachya</i>	100.0	67.1	62.5	50	75		Y		Y
	<i>Picris echioides</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Rumex crispus</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Juncus phaeocephalus</i>	50.0	20.9	20.0	40	40				Y
	<i>Holcus lanatus</i>	50.0	5.5	5.0	10	10				Y
	<i>Lolium perenne</i>	50.0	2.7	2.5	5	5				Y
	<i>Heliotropium curassavicum</i>	50.0	1.6	1.5	3	3				Y
	<i>Polygonum spp.</i>	50.0	1.0	1.0	2	2				Y
	<i>Lotus spp.</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Hypochaeris radicata</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Polypogon monspeliensis</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Mentha pulegium</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Lythrum hyssopifolium</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Epilobium ciliatum</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Rumex salicifolius</i>	50.0	0.1	0.1	0.2	0.2				Y

***Eriophyllum staechadifolium* – *Erigeron glaucus* – *Eriogonum latifolium* Herbaceous Alliance**



Common Name: Seaside woolly-sunflower - seaside daisy - buckwheat patches

NVC Alliance Code: A1614. *Abronia latifolia* - *Ambrosia chamissonis* Dune Grassland Alliance

Statewide Description

Artemisia pycnocephala, *Erigeron glaucus*, *Eriogonum latifolium*, *Eriogonum parvifolium*, *Eriophyllum staechadifolium* and/or *Fragaria chiloensis* mix with herbaceous species such as *Achillea millefolium*, *Angelica hendersonii*, *Armeria maritima*, *Bromus carinatus*, *Bromus maritimus*, *Camissonia cheiranthifolia*, *Cardionema ramosissimum*, *Carpobrotus edulis*, *Daucus pusillus*, *Dudleya farinosa*, *Dudleya* spp., *Grindelia stricta*, or *Poa douglasii*. Emergent shrubs may be present including *Baccharis pilularis*, *Lupinus arboreus*, *Lupinus versicolor*, or *Rubus ursinus*.

This alliance occupies a narrow band along the immediate coast of California. It typically occurs on rocky or sandy soils of California coastal strand along the North Coast and Central Coast, although occurrences of the diagnostic taxa are known along the Pacific Coast found from San Diego County to central Oregon. Stands occur on inner dunes to steep slopes above dunes inland from the leading edge of the beach; they are distinct from those of the *Abronia latifolia* - *Ambrosia chamissonis* Alliance which is found on more active dune surfaces. Stands of this alliance are rarely impacted

by saltwater overwash from storm events. However, reflective dune sand and steep coastal bluffs can have high temperatures in full sunlight. Dry sand is mobile so plants can be damaged by sand blast, root exposure, and foliage burial under the shifting sands. Additionally, beach sand has low water storage capacity and is nutrient poor and lacking in organic matter. Summer fog ameliorates surface conditions to some degree (Pickart and Barbour 2007).

Species composition of this alliance is richer on the inner dunes and coastal bluffs than the related *Abronia latifolia* - *Ambrosia chamissonis* Alliance because of somewhat decreased salt spray yet wind intensity may vary depending on setting. Vegetation is generally short or mounded in stature due to environmental factors such as intense winds, fluctuation in and/or high temperatures, salt spray, and sand/sandstone movement. Stands are primarily composed of perennial herbs and subshrubs but some may have woody species such as *Baccharis pilularis*, *Lupinus arboreus*, *L. variicolor*, and *Rubus ursinus*.

Species dominance shifts spatially and temporally in coastal environments and dune ecosystems because environmental conditions create fine-scale vegetation patterning, in which stands of this alliance are often adjacent to stands of the *Abronia latifolia* - *Ambrosia chamissonis*, *Lupinus arboreus*, or *Lupinus chamissonis* - *Ericameria ericoides* alliances. The *Eriophyllum staechadifolium* - *Erigeron glaucus* - *Eriogonum latifolium* alliance is defined following surveys of coastal stands from Mendocino to Santa Barbara county. Stands dominated by *Artemisia pycnocephala* were previously considered as various associations of the *Abronia latifolia* - *Ambrosia chamissonis* dune mat alliance, depending on the codominant species, but have now been included in this more recently defined dune mat alliance.

Local Vegetation Description

The Seaside woolly-sunflower - seaside daisy - buckwheat patches Alliance forms an open to continuous herbaceous layer. The shrub layer is open to continuous and the tree layer is absent. Characteristic herbs include *Achillea millefolium*. Those herbs often present include *Bromus maritimus*, *Carpobrotus edulis*, *Daucus pusillus*, *Erigeron glaucus*, *Eriogonum latifolium*, *Eriophyllum staechadifolium*, and *Fragaria chiloensis*, and herbs that are sometimes present include *Ambrosia chamissonis*, *Anagallis arvensis*, *Angelica hendersonii*, *Artemisia pycnocephala*, *Camissonia cheiranthifolia*, *Chlorogalum pomeridianum*, *Dudleya caespitosa*, *Dudleya farinosa*, *Eschscholzia californica*, *Gamochaeta ustulata*, *Grindelia stricta*, *Hypochaeris radicata*, *Iris douglasiana*, *Madia sativa*, *Plantago lanceolata*, *Pseudognaphalium stramineum*, *Pterostegia drymarioides*, *Scrophularia californica*, *Sidalcea malviflora*, *Sonchus asper*, *Sonchus oleraceus*, and *Vulpia bromoides*. Commonly associated emergent shrubs include *Baccharis pilularis*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0.0 – 0.0	no data	no data
Shrub	13.3	0.0 – 80.0	0.5	0 – 2

Herb	60.0	10 – 95	0.3	0 – 1
------	------	---------	-----	-------

Local Membership Rule

Artemisia pycnocephala, *Erigeron glaucus*, *Eriophyllum staechadifolium*, *Eriogonum latifolium*, and/or *Fragaria chiloensis* dominate or characterize stabilized dunes, sea bluffs and exposed coastal terraces. Shrubs such as *Baccharis pilularis*, *Lupinus arboreus*, *L. versicolor*, and *Rubus ursinus* may be present at low cover. Other native forbs and grasses may be present including *Achillea millefolium*, *Angelica hendersonii*, *Bromus carinatus*, *Daucus pusillus* and/or *Dudleya* spp.

Local Environmental Description

Elevation: Mean 37 m, Range 4 – 367 m

Aspect: SW (11), NW (7), Variable (5), NE (3), Flat (2), W (1)

Slope: Mean 16 degrees, Range 0 – 45 degrees

Macro Topography: Lower 1/3 of slope (10), Upper 1/3 of slope (4), Middle 1/3 of slope (4), Lower to Middle 1/3 of slope (4), Middle to Upper 1/3 of slope (2), Ridge top (2), Upper 1/3 of slope to Ridgetop (2), Dune/sandfield (1)

Large Rock: Mean 0.1%, Range 0.0 – 3.0%

Small Rock: Mean 0.7%, Range 0.0 – 5.2%

Fines Cover: Mean 36.4%, Range 1.0 – 94%

Litter Cover: Mean 50.1%, Range 0.0 – 96%

Soil Texture (field assessed): Sand, (class unknown) (8), Medium to very fine, sandy loam (5), Coarse, loamy sand (4), Loam, (class unknown) (2), Medium sand (2), Medium to very fine, loamy sand (2), Not recorded (1), Moderately fine sandy clay loam (1), Moderately coarse, sandy loam (1), Fine sandy clay (1), Clay, (class unknown) (1), Moderately fine clay loam (1)

Geology (field or map data): Sandstone (9), Sand dunes (8), Sedimentary (type unknown) (3), Volcanic and metavolcanic rocks (2), Granitic (generic) (2), Alluvium (1), Clayey alluvium (1), Sandstone, shale, and conglomerate (1), Granitic (1), Sandstone and other sedimentary (1)

San Mateo County Watersheds: Pacifica (11), Ano Nuevo (8), Pescadero Creek (8), San Francisco Coastal (3), San Mateo Bayside (1)

Other Watersheds, San Francisco Co.: San Francisco Coastal (1)

Site Impacts

This alliance has low non-native plant cover (average 14.5%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Carpobrotus edulis*, *Hypochaeris radicata*, *Plantago lanceolata*, *Sonchus asper*, *Sonchus oleraceus*, and *Vulpia bromoides*.

Associations in San Mateo County

- *Artemisia pycnocephala*
- *Erigeron glaucus* – *Fragaria chiloensis* *Eriogonum parvifolium*

Eriophyllum staechadifolium – *Erigeron glaucus* – *Eriogonum latifolium* Herbaceous Alliance

- *Eriophyllum staechadifolium* – *Eriogonum latifolium*

Classification Comments

This alliance was newly described for Point Arena, Mendocino County (Buck-Diaz et al 2020). **References:** AIS 2013, AIS 2019, Buck-Diaz et al. 2020, Holton and Johnson 1979, WRA 2017b

Global Rarity Rank: G3 **State Rarity Rank:** S3

Surveys Used for Description

Total: N=32; San Mateo County (n=31): GGNRA265, PGA1829, PWNCS01A, SMAT0046, SMAT0070, SMAT0113, SMAT0160, SMAT0171, SMAT0196, SMAT0199, SMAT0201, SMAT0202, SMAT0268, SMAT0269, SMAT0270, SMAT0273, SMAT0312, SMAT0313, SMAT0321, SMAT0334, SMAT0642, SMAT0643, SMAT0645, SMAT0658, SMATREL0197, WRBL034, WRBL035, WRBL045, WRBL074, WRBL075, YERBA04

San Francisco County (n=1): SMAT0226

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	71.9	50.3	4.5	0.2	15				Y
	<i>Rubus ursinus</i>	34.4	6.3	1.0	0.2	15				
Herb	<i>Achillea millefolium</i>	81.3	2.2	1.6	0.2	25	Y			Y
	<i>Eriophyllum stoechadifolium</i>	71.9	17.3	11.9	0.2	70				Y
	<i>Fragaria chiloensis</i>	68.8	15.2	12.7	0.2	85				Y
	<i>Eriogonum latifolium</i>	62.5	4.4	4.0	0.2	60				Y
	<i>Bromus maritimus</i>	59.4	0.8	0.5	0.2	4				Y
	<i>Erigeron glaucus</i>	56.3	7.8	4.8	0.2	30				Y
	<i>Carpobrotus edulis</i>	53.1	6.1	3.6	0.2	25				Y
	<i>Daucus pusillus</i>	53.1	1.0	0.5	0.2	4				Y
	<i>Vulpia bromoides</i>	40.6	1.9	1.4	0.2	25				
	<i>Dudleya farinosa</i>	37.5	0.8	0.5	0.2	5				
	<i>Chlorogalum pomeridianum</i>	37.5	1.0	0.5	0.2	8				
	<i>Gamochaeta ustulata</i>	37.5	0.6	0.4	0.2	10				
	<i>Grindelia stricta</i>	34.4	1.8	1.2	0.2	20				

<i>Plantago lanceolata</i>	31.3	0.9	1.1	0.2	30
<i>Angelica hendersonii</i>	31.3	1.1	0.8	0.2	15
<i>Hypochaeris radicata</i>	31.3	0.4	0.3	0.2	5
<i>Anagallis arvensis</i>	31.3	0.1	0.1	0.2	1
<i>Scrophularia californica</i>	28.1	0.6	0.6	0.2	12.8
<i>Pseudognaphalium stramineum</i>	28.1	0.2	0.1	0.2	1
<i>Eschscholzia californica</i>	28.1	0.1	0.1	0.2	1
<i>Artemisia pycnocephala</i>	25.0	11.0	5.1	3	35
<i>Ambrosia chamissonis</i>	25.0	1.3	1.0	0.2	15
<i>Dudleya caespitosa</i>	25.0	1.1	0.6	0.2	10
<i>Madia sativa</i>	25.0	0.2	0.1	0.2	1
<i>Camissonia cheiranthifolia</i>	25.0	0.2	0.1	0.2	1
<i>Iris douglasiana</i>	21.9	1.2	0.5	0.2	10
<i>Sidalcea malviflora</i>	21.9	0.3	0.2	0.2	2
<i>Pterostegia drymarioides</i>	21.9	0.1	0.1	0.2	1
<i>Sonchus asper</i>	21.9	0.1	0.1	0.2	0.5
<i>Sonchus oleraceus</i>	21.9	0.1	0.1	0.2	0.5

***Artemisia pycnocephala* Association**

Common Name: Beach Wormwood Patches

Alliance: *Eriophyllum staechadifolium* – *Erigeron glaucus* – *Eriogonum latifolium*
Herbaceous Alliance

Local Vegetation Description

The Beach Wormwood Association forms an open to intermittent herbaceous layer. The shrub layer is sparse to open and the tree layer is absent. The dominant herbs is *Artemisia pycnocephala*, and characteristic herbs include *Abronia latifolia*, *Ambrosia chamissonis*, *Camissonia cheiranthifolia*, *Carpobrotus edulis*, *Eriogonum latifolium*, and *Fragaria chiloensis*. Those herbs often present include *Achillea millefolium*, *Cakile maritima*, *Claytonia perfoliata*, *Cryptantha leiocarpa*, *Daucus pusillus*, and *Eriophyllum staechadifolium*, and herbs that are sometimes present include *Bromus maritimus*, *Dudleya farinosa*, *Elymus mollis*, *Pseudognaphalium stramineum*, and *Vulpia myuros*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis* and *Lupinus arboreus*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	4.0	0.2 – 10.0	0.3	0 – 1
Herb	45.2	21.0– 58.0	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 11 m, Range 7 – 13 m

Aspect: Variable (3), SW (1), Flat (1)

Slope: Mean 12 degrees, Range 0 – 25 degrees

Macro Topography: Lower 1/3 of slope (2), Lower to Middle 1/3 of slope (2), Dune/sandfield (1)

Large Rock: 0.0%

Small Rock: Mean 1.3%, Range 0.0 – 5.2%

Fines Cover: Mean 80.8%, Range 52.0 – 94.0%

Litter Cover: Mean 12.8%, Range 0.0 – 40%

Soil Texture (field assessed): Sand, (class unknown) (5)

Geology (field or map data): Sand dunes (3), Sandstone (1)

San Mateo County Watersheds: Ano Nuevo (2), Pescadero Creek (2), Pacifica (1)

Site Impacts

This association has low non-native plant cover (average 6.9%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Cakile maritima*, *Carpobrotus edulis*, and *Vulpia myuros*.

Classification Comments

None.

References: Casavecchia and Biondi 2001, Klein et al. 2015, McBride and Stone 1976

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=5; San Mateo County (n=): SMAT0046, SMAT0070, SMAT0201, SMAT0658, WRBL074

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	100.0	64.1	2.9	0.2	10		Y		Y
	<i>Lupinus arboreus</i>	60.0	24.9	0.6	1	1				Y
Herb	<i>Artemisia pycnocephala</i>	100.0	65.1	28.2	18	35		Y		Y
	<i>Camissonia cheiranthifolia</i>	100.0	0.9	0.4	0.2	1				Y
	<i>Eriogonum latifolium</i>	80.0	4.8	2.3	0.2	10				Y
	<i>Carpobrotus edulis</i>	80.0	4.3	2.2	0.2	5.2				Y
	<i>Ambrosia chamissonis</i>	80.0	2.7	1.5	0.2	7				Y
	<i>Abronia latifolia</i>	80.0	2.2	1.1	0.2	4				Y
	<i>Fragaria chiloensis</i>	80.0	1.4	0.7	0.2	3				Y
	<i>Eriophyllum stoechadifolium</i>	60.0	4.0	2.2	0.2	10				Y
	<i>Claytonia perfoliata</i>	60.0	0.8	0.3	0.2	1.2				Y
	<i>Daucus pusillus</i>	60.0	0.7	0.3	0.2	1				Y
	<i>Achillea millefolium</i>	60.0	0.7	0.3	0.2	1				Y
	<i>Cakile maritima</i>	60.0	0.4	0.2	0.2	0.5				Y
	<i>Cryptantha leiocarpa</i>	60.0	0.3	0.1	0.2	0.2				Y
	<i>Elymus mollis</i>	40.0	0.9	0.4	0.2	2				
	<i>Dudleya farinosa</i>	40.0	0.6	0.3	0.5	1				
	<i>Vulpia myuros</i>	40.0	0.6	0.2	0.2	1				
	<i>Pseudognaphalium stramineum</i>	40.0	0.3	0.1	0.2	0.2				
<i>Bromus maritimus</i>	40.0	0.3	0.1	0.2	0.5					

Artemisia pycnocephala Association

Eriophyllum staechadifolium – *Erigeron glaucus* – *Eriogonum latifolium* Herbaceous Alliance

***Erigeron glaucus* – *Fragaria chiloensis* Association**

Common Name: Seaside Daisy – Beach strawberry Patches

Alliance: *Eriophyllum staechadifolium* – *Erigeron glaucus* – *Eriogonum latifolium*
Herbaceous Alliance

Local Vegetation Description

The Seaside Daisy – Beach strawberry Association forms an open to continuous herbaceous layer. The shrub layer is open and the tree layer is absent. Dominant herbs include *Fragaria chiloensis*, and characteristic herbs include *Achillea millefolium* and *Erigeron glaucus*. Those herbs often present include *Bromus maritimus*, *Daucus pusillus*, *Eriogonum latifolium*, *Eriophyllum stoechadifolium*, *Gamochaeta ustulata*, *Grindelia stricta*, *Hypochaeris radicata*, *Plantago lanceolata*, and *Vulpia bromoides*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	4.6	0.0 – 13.0	0.3	0 – 1
Herb	67.9	37 – 95	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 19 m, Range 4 – 36 m

Aspect: NW (5), SW (5), NE (2), Flat (1), Variable (1), W (1)

Slope: Mean 13 degrees, Range 0 – 40 degrees

Macro Topography: Lower 1/3 of slope (6), Lower to Middle 1/3 of slope (2), Middle to Upper 1/3 of slope (2), Ridge top (2), Middle 1/3 of slope (1), Upper 1/3 of slope (1), Upper 1/3 of slope to Ridgetop (1)

Large Rock: Mean 0.0%, Range 0.0 – 0.2%

Fines Cover: Mean 30.1%, Range 2 – 90.0%

Small Rock: Mean 0.6%, Range 0.0 – 4.0%

Litter Cover: Mean 56.7%, Range 0.0 – 95%

Soil Texture (field assessed): Coarse, loamy sand (3), Medium to very fine, sandy loam (3), Medium sand (2), Sand, (class unknown) (1), Moderately fine sandy clay loam (1), Moderately fine clay loam (1), Loam, (class unknown) (1), Fine sandy clay (1), Clay, (class unknown) (1), Medium to very fine, loamy sand (1)

Geology (field or map data): Sandstone (5), Granitic (generic) (2), Sand dunes (2), Sedimentary (type unknown) (2), Volcanic and metavolcanic rocks (1), Sandstone and other sedimentary (1), Clayey alluvium (1)

San Mateo County Watersheds: Pacifica (5), Pescadero Creek (4), Ano Nuevo (3),

Erigeron glaucus – *Fragaria chiloensis* Association
Eriophyllum staechadifolium – *Erigeron glaucus* – *Eriogonum latifolium* Herbaceous Alliance

San Francisco Coastal (2)

Other Watersheds, San Francisco Co.: San Francisco Coastal (1)

Site Impacts

This association has low non-native plant cover (average 16.0%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Bromus hordeaceus*, *Carpobrotus edulis*, *Geranium dissectum*, *Hypochaeris radicata*, *Lolium perenne*, *Picris echioides*, *Plantago coronopus*, *Plantago lanceolata*, *Sonchus asper*, and *Vulpia bromoides*.

Classification Comments

This association was newly described for the Marin County mapping project.

References: Buck-Diaz et al. 2021

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=15; San Mateo County (n=14): SMAT0113, SMAT0199, SMAT0268, SMAT0270, SMAT0273, SMAT0312, SMAT0321, SMAT0334, SMAT0643, SMAT0645, SMATREL0197, WRBL035, WRBL045, WRBL075

San Francisco County (n=1): SMAT0226

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	60.0	50.2	3.6	3	10				Y
	<i>Lupinus versicolor</i>	26.7	11.7	0.6	0.5	4				
	<i>Rubus ursinus</i>	26.7	1.3	0.1	0.2	1				
Herb	<i>Fragaria chiloensis</i>	86.7	31.0	26.1	2	85			Y	Y
	<i>Erigeron glaucus</i>	80.0	14.3	8.4	0.2	30				Y
	<i>Achillea millefolium</i>	80.0	1.2	0.8	0.2	3				Y
	<i>Bromus maritimus</i>	73.3	1.3	0.9	0.2	4				Y
	<i>Vulpia bromoides</i>	66.7	4.0	3.0	0.2	25				Y
	<i>Eriophyllum stoechadifolium</i>	66.7	3.5	2.5	0.2	17.5				Y
	<i>Eriogonum latifolium</i>	66.7	2.6	1.8	0.2	7				Y
	<i>Daucus pusillus</i>	66.7	1.5	0.9	0.2	4				Y
	<i>Grindelia stricta</i>	60.0	3.2	2.3	0.2	20				Y
	<i>Gamochaeta ustulata</i>	53.3	1.1	0.8	0.2	10				Y
	<i>Hypochaeris radicata</i>	53.3	0.8	0.5	0.2	5				Y

Erigeron glaucus – *Fragaria chiloensis* Association

Eriophyllum stoechadifolium – *Erigeron glaucus* – *Eriogonum latifolium* Herbaceous Alliance

<i>Plantago lanceolata</i>	53.3	0.4	0.3	0.2	2	Y
<i>Dudleya farinosa</i>	46.7	0.9	0.6	0.2	3	
<i>Anagallis arvensis</i>	46.7	0.2	0.2	0.2	1	
<i>Carpobrotus edulis</i>	40.0	4.8	2.5	0.2	20	
<i>Madia sativa</i>	40.0	0.3	0.2	0.2	1	
<i>Dudleya caespitosa</i>	33.3	1.7	1.1	1	10	
<i>Chlorogalum pomeridianum</i>	33.3	1.6	0.9	0.2	8	
<i>Plantago coronopus</i>	33.3	0.9	0.5	0.2	6	
<i>Hordeum brachyantherum</i>	33.3	0.7	0.6	0.2	4	
<i>Luzula comosa</i>	33.3	0.5	0.3	0.2	3	
<i>Angelica hendersonii</i>	33.3	0.5	0.3	0.2	2.8	
<i>Cirsium quercetorum</i>	33.3	0.3	0.2	0.2	1	
<i>Pseudognaphalium stramineum</i>	33.3	0.2	0.1	0.2	1	
<i>Iris douglasiana</i>	26.7	2.2	1.0	0.2	10	
<i>Danthonia californica</i>	26.7	1.0	0.5	0.2	5	
<i>Sidalcea malviflora</i>	26.7	0.5	0.3	0.5	2	
<i>Geranium dissectum</i>	26.7	0.3	0.2	0.2	1.6	
<i>Plantago maritima</i>	26.7	0.3	0.1	0.2	1	
<i>Bromus hordeaceus</i>	26.7	0.2	0.1	0.2	1	
<i>Eschscholzia californica</i>	26.7	0.2	0.1	0.2	1	
<i>Picris echioides</i>	26.7	0.1	0.1	0.2	1	
<i>Lolium perenne</i>	26.7	0.1	0.1	0.2	0.5	
<i>Sonchus asper</i>	26.7	0.1	0.1	0.2	0.5	

***Eriogonum parvifolium* Provisional Association**

Common Name: Seacliff Wild Buckwheat Patches

Alliance: *Eriophyllum staechadifolium* – *Erigeron glaucus* – *Eriogonum latifolium*
Herbaceous Alliance

Local Vegetation Description

The Seacliff Wild Buckwheat Association forms a continuous shrub layer in the single survey available. The tree layer is absent and the herb layer is open. The dominant shrub is *Eriogonum parvifolium*. Other shrubs present are *Artemisia californica*, *Baccharis pilularis*, *Lupinus versicolor*, and *Rubus ursinus*.

Dominant herbs include *Eriophyllum staechadifolium*, and characteristic herbs include *Achillea millefolium*, *Bromus maritimus*, *Carpobrotus edulis*, *Chlorogalum pomeridianum*, *Daucus pusillus*, *Dudleya caespitosa*, *Erigeron glaucus*, *Fragaria chiloensis*, *Gamochaeta ustulata*, *Hirschfeldia incana*, *Iris douglasiana*, *Lotus wrangelianus*, *Madia sativa*, *Polypodium californicum*, *Raphanus sativus*, and *Sidalcea malviflora*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	NA	no data	no data
Hardwood	0.0	NA	no data	no data
Regenerating or Shrubby Tree	0.0	NA	no data	no data
Shrub	80.0	NA	0.8	0.5 – 1
Herb	5.0	NA	0.3	0 – 0.5

Local Environmental Description

Elevation: 26 m

Aspect: SW (1)

Slope: 37 degrees

Macro Topography: Middle 1/3 of slope (1)

Large Rock: 0.0%

Fines Cover: 2.2%

Small Rock: 5.0%

Litter Cover: 90%

Soil Texture (field assessed): Medium to very fine, sandy loam (1)

Geology (field or map data): Sedimentary (type unknown) (1)

San Mateo County Watersheds: Pacifica (1)

Site Impacts

This association has low non-native plant cover (average 6.0%) relative to native

cover. Non-native species that occur with highest frequency and abundance include *Carpobrotus edulis*, *Hirschfeldia incana*, and *Raphanus sativus*.

Classification Comments

This association is considered provisional since it is under-sampled in its expected range. This name has been used in previous vegetation mapping projects, but has been newly inducted into the MCV.

References: AIS 2013, AIS 2019, WRA 2017b

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=1; San Mateo County (n=1): SMAT0196

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Eriogonum parvifolium</i>	100.0	74.5	65.0	65	65		Y		Y
	<i>Artemisia californica</i>	100.0	11.5	10.0	10	10				Y
	<i>Baccharis pilularis</i>	100.0	11.5	10.0	10	10				Y
	<i>Rubus ursinus</i>	100.0	2.3	2.0	2	2				Y
	<i>Lupinus versicolor</i>	100.0	0.2	0.2	0.2	0.2				Y
Herb	<i>Eriophyllum stoechadifolium</i>	100.0	36.8	5.0	5	5			Y	Y
	<i>Carpobrotus edulis</i>	100.0	29.4	4.0	4	4				Y
	<i>Raphanus sativus</i>	100.0	7.4	1.0	1	1				Y
	<i>Hirschfeldia incana</i>	100.0	7.4	1.0	1	1				Y
	<i>Madia sativa</i>	100.0	1.5	0.2	0.2	0.2				Y
	<i>Chlorogalum pomeridianum</i>	100.0	1.5	0.2	0.2	0.2				Y
	<i>Fragaria chiloensis</i>	100.0	1.5	0.2	0.2	0.2				Y
	<i>Gamochaeta ustulata</i>	100.0	1.5	0.2	0.2	0.2				Y
	<i>Daucus pusillus</i>	100.0	1.5	0.2	0.2	0.2				Y
	<i>Lotus wrangelianus</i>	100.0	1.5	0.2	0.2	0.2				Y
	<i>Bromus maritimus</i>	100.0	1.5	0.2	0.2	0.2				Y
	<i>Achillea millefolium</i>	100.0	1.5	0.2	0.2	0.2				Y
	<i>Erigeron glaucus</i>	100.0	1.5	0.2	0.2	0.2				Y
	<i>Dudleya caespitosa</i>	100.0	1.5	0.2	0.2	0.2				Y
	<i>Polypodium californicum</i>	100.0	1.5	0.2	0.2	0.2				Y

Eriogonum parvifolium Provisional Association

Eriophyllum stoechadifolium – *Erigeron glaucus* – *Eriogonum latifolium* Herbaceous Alliance

<i>Sidalcea malviflora</i>	100.0	1.5	0.2	0.2	0.2	Y
<i>Iris douglasiana</i>	100.0	1.5	0.2	0.2	0.2	Y

***Eriophyllum staechadifolium* – *Eriogonum latifolium* Association**

Common Name: Seaside Woolly Sunflower – Coast Buckwheat Patches

Alliance: *Eriophyllum staechadifolium* – *Erigeron glaucus* – *Eriogonum latifolium*
Herbaceous Alliance

Local Vegetation Description

The Seaside Woolly Sunflower – Coast Buckwheat Association forms an intermittent to continuous herbaceous layer. The shrub layer is open and the tree layer is absent. Dominant herbs include *Eriophyllum staechadifolium*, and characteristic herbs include *Achillea millefolium*. Those herbs often present include *Carpobrotus edulis*, *Chlorogalum pomeridianum*, and *Eriogonum latifolium*, and herbs that are sometimes present include *Anagallis arvensis*, *Angelica hendersonii*, *Bromus maritimus*, *Castilleja affinis*, *Daucus pusillus*, *Dudleya farinosa*, *Erigeron glaucus*, *Eschscholzia californica*, *Fragaria chiloensis*, *Galium aparine*, *Gamochaeta ustulata*, *Marah fabaceus*, *Pteridium aquilinum*, *Pterostegia drymarioides*, *Raphanus sativus*, *Scrophularia californica*, *Sonchus oleraceus*, and *Vulpia bromoides*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis* and *Rubus ursinus*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	10.9	0.0 – 27.0	0.8	0 – 2
Herb	72.6	49 – 90	0.4	0 – 1

Local Environmental Description

Elevation: Mean 73 m, Range 6 – 367 m

Aspect: SW (4), NW (2), Variable (1), NE (1)

Slope: Mean 20 degrees, Range 3 – 45 degrees

Macro Topography: Upper 1/3 of slope (3), Lower 1/3 of slope (2), Middle 1/3 of slope (2), Upper 1/3 of slope to Ridgetop (1)

Large Rock: Mean 0.4%, Range 0.0 – 3.0%

Small Rock: Mean 0.5%, Range 0.0 – 3.0%

Fines Cover: Mean 27.8%, Range 1.0 – 62.0%

Litter Cover: Mean 56.0%, Range 12.0 – 96%

Soil Texture (field assessed): Sand, (class unknown) (2), Moderately coarse, sandy loam (1), Medium to very fine, sandy loam (1), Loam, (class unknown) (1), Coarse, loamy sand (1), Medium to very fine, loamy sand (1), Not recorded (1)

Geology (field or map data): Sandstone (3), Sand dunes (3), Sandstone, shale, and conglomerate (1), Volcanic and metavolcanic rocks (1), Granitic (1), Alluvium (1)

San Mateo County Watersheds: Pacifica (4), Ano Nuevo (3), Pescadero Creek (2), San Mateo Bayside (1)

Site Impacts

This association has low non-native plant cover (average 16.7%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Carpobrotus edulis*, *Raphanus sativus*, *Sonchus oleraceus*, and *Vulpia bromoides*.

Classification Comments

This association was first described from Point Arena in Mendocino County (Buck-Diaz et al. 2020).

References: Buck-Diaz et al. 2020, Holton and Johnson 1979

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=11; San Mateo County (n=11): GGNRA265, PGA1829, PWNCS01A, SMAT0160, SMAT0171, SMAT0202, SMAT0269, SMAT0313, SMAT0642, WRBL034, YERBA04

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	72.7	47.8	5.8	2	15				Y
	<i>Rubus ursinus</i>	54.5	16.2	2.7	0.2	15				Y
	<i>Toxicodendron diversilobum</i>	27.3	4.4	0.4	0.2	3				
Herb	<i>Achillea millefolium</i>	90.9	4.2	3.4	0.2	25				Y
	<i>Eriophyllum stoechadifolium</i>	81.8	40.4	29.8	5	70			Y	Y
	<i>Eriogonum latifolium</i>	54.5	7.0	8.1	0.2	60				Y
	<i>Carpobrotus edulis</i>	54.5	6.5	5.7	0.2	25				Y
	<i>Chlorogalum pomeridianum</i>	54.5	0.6	0.3	0.2	2				Y
	<i>Angelica hendersonii</i>	45.5	2.6	1.8	0.2	15				

<i>Scrophularia californica</i>	45.5	0.7	0.4	0.2	2
<i>Bromus maritimus</i>	45.5	0.4	0.3	0.2	1
<i>Erigeron glaucus</i>	36.4	3.0	2.5	0.2	15
<i>Fragaria chiloensis</i>	36.4	1.2	0.9	0.2	5
<i>Marah fabaceus</i>	36.4	0.4	0.3	0.2	2
<i>Pterostegia drymarioides</i>	36.4	0.2	0.2	0.2	1
<i>Galium aparine</i>	36.4	0.1	0.1	0.2	0.2
<i>Eschscholzia californica</i>	36.4	0.1	0.1	0.2	0.2
<i>Raphanus sativus</i>	27.3	2.1	1.9	0.2	20
<i>Pteridium aquilinum</i>	27.3	1.4	1.2	0.2	10
<i>Dudleya farinosa</i>	27.3	0.7	0.7	0.2	5
<i>Daucus pusillus</i>	27.3	0.4	0.2	0.2	2
<i>Vulpia bromoides</i>	27.3	0.2	0.2	0.2	1
<i>Gamochaeta ustulata</i>	27.3	0.1	0.1	0.2	0.5
<i>Anagallis arvensis</i>	27.3	0.1	0.1	0.2	0.2
<i>Castilleja affinis</i>	27.3	0.1	0.1	0.2	0.5
<i>Sonchus oleraceus</i>	27.3	0.1	0.1	0.2	0.2

***Festuca idahoensis* – *Danthonia californica* Herbaceous Alliance**



Common Name: Idaho fescue - California oatgrass grassland

NVC Alliance Code: A4210. *Festuca idahoensis* ssp. *roemeri* - *Danthonia californica*
Interior Prairie, Bald & Bluff Grassland Alliance

Statewide Description

Danthonia californica, *Festuca idahoensis* and/or *Festuca rubra* is dominant or co-dominant in the herbaceous layer with *Achillea millefolium*, *Aira caryophyllea*, *Anagallis arvensis*, *Bromus hordeaceus*, *Chlorogalum pomeridianum*, *Cynosurus echinatus*, *Hypochaeris radicata*, *Koeleria macrantha*, *Lolium perenne* ssp. *multiflorum*, *Nassella pulchra*, *Plantago lanceolata*, *Rumex acetosella*, *Sisyrinchium bellum* and *Vulpia bromoides*. Emergent trees or shrubs may be present at low cover, including *Baccharis pilularis*, *Elymus glaucus*, *Pseudotsuga menziesii*, *Rubus ursinus*, or *Toxicodendron diversilobum*.

Although these three character species exist in a variety of habitats across California, this alliance describes coastal prairie grasslands along the central coast and in northwestern California. On the North Coast (north of Marin County), this coastal prairie occurs in two settings: terrace prairie along the coastline at low and maritime elevations, and bald hills prairie on inland ridges and hilltops. In either phase, shrubs and trees are generally absent. Native perennial bunchgrasses mix with annual and

Festuca idahoensis – *Danthonia californica* Herbaceous Alliance

perennial forbs creating a colorful display in late spring (Ornduff et al. 2003).

Local Vegetation Description

The Idaho fescue - California oatgrass grassland Alliance forms an intermittent to continuous herbaceous layer. The shrub layer is open and the tree layer is open. Characteristic herbs include *Danthonia californica* and *Vulpia bromoides*. Those herbs often present include *Aira caryophylla*, *Avena* spp., *Bromus hordeaceus*, *Geranium dissectum*, *Lolium perenne*, *Rumex acetosella*, and *Sisyrinchium bellum*, and herbs that are sometimes present include *Achillea millefolium*, *Anagallis arvensis*, *Brachypodium distachyon*, *Briza maxima*, *Briza minor*, *Bromus carinatus*, *Bromus diandrus*, *Chlorogalum pomeridianum*, *Cirsium vulgare*, *Clarkia rubicunda*, *Cynosurus echinatus*, *Elymus glaucus*, *Erodium cicutarium*, *Eschscholzia californica*, *Festuca idahoensis*, *Holcus lanatus*, *Hypochaeris radicata*, *Juncus* spp., *Koeleria macrantha*, *Linum bienne*, *Lotus corniculatus*, *Nassella pulchra*, *Phalaris aquatica*, *Plantago erecta*, *Plantago lanceolata*, *Pteridium aquilinum*, *Sidalcea malviflora*, *Silene gallica*, *Sonchus asper*, *Trifolium dubium*, *Vicia sativa*, and *Vulpia microstachys*. Commonly associated emergent shrubs include *Baccharis pilularis*. Commonly associated non-vascular plants include Moss.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.3	0 – 7	no data	no data
Hardwood	1.0	0 – 4	1.5	1 – 2
Regenerating or Shrubby Tree	0.0	0 – 0.2	no data	no data
Shrub	4.3	0.2 – 10	0.4	0 – 1
Herb	73.0	60 – 85	0.4	0 – 1

Local Membership Rule

Festuca idahoensis, *F. rubra* and/or *Danthonia californica* dominate or characterize stands. *Bromus carinatus*, *Elymus glaucus*, *Nassella pulchra*, *Plantago erecta*, and a variety of native and non-native forbs and grasses may intermix as sub-dominants. *Festuca*, *Danthonia* or *Perideridia kelloggii* and other native species share at least 10% relative cover in the herb layer, with other non-native grasses and forbs sometimes having higher cover (e.g., *Cynosurus echinatus*, *Hypochaeris radicata*, and *Vulpia bromoides*). Occasionally, the larger *Festuca californica* may replace *F. idahoensis* in somewhat shadier or less exposed sites.

Local Environmental Description

Elevation: Mean 238 m, Range 18 – 766 m

Aspect: NW (7), SW (4), W (4), SE (3), NE (3), N (2), Flat (1), S (1)

Slope: Mean 10 degrees, Range 0 – 35 degrees

Macro Topography: Upper 1/3 of slope (9), Middle 1/3 of slope (4), Ridge top (3), Lower 1/3 of slope (2), Other (2), Draw (1), Bottom to Lower 1/3 of slope (1)

Large Rock: Mean 0.8%, Range 0.0 – 8%

Small Rock: Mean 2.3%, Range 0.0 – 19%

Fines Cover: Mean 15.4%, Range 0.2 – 64.5%

Litter Cover: Mean 19.2%, Range 0.2 – 92%

Soil Texture (field assessed): Clay, (class unknown) (1), Moderately fine sandy clay loam (1), Moderately fine clay loam (1), Loam, (class unknown) (1), Medium to very fine, sandy loam (1), Moderately coarse, sandy loam (1)

Geology (field or map data): Sandstone and other sedimentary (9), Sandstone, shale, and conglomerate (7), Serpentine (4), Alluvium (4), Volcanic and metavolcanic rocks (3), Shale and other sedimentary (2), Ultramafic rocks, mostly serpentine (2), Mixed sedimentary (1), Sandstone (1), Granitic (generic) (1)

San Mateo County Watersheds: San Mateo Bayside (13), Ano Nuevo (6), Pescadero Creek (4), Palo Alto (3), Half Moon Bay (2), Pacifica (2), San Gregorio Creek (2), San Francisco Coastal (1), Tunitas Creek (1)

Site Impacts

This alliance has moderate non-native plant cover (average 42.0%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira caryophylla*, *Anagallis arvensis*, *Brachypodium distachyon*, *Briza maxima*, *Briza minor*, *Bromus diandrus*, *Bromus hordeaceus*, *Cirsium vulgare*, *Cynosurus echinatus*, *Erodium cicutarium*, *Geranium dissectum*, *Holcus lanatus*, *Hypochaeris radicata*, *Linum bienne*, *Lotus corniculatus*, *Phalaris aquatica*, *Plantago lanceolata*, *Rumex acetosella*, *Silene gallica*, *Sonchus asper*, *Trifolium dubium*, *Vicia sativa*, and *Vulpia bromoides*.

Associations in San Mateo County

- *Danthonia californica* – *Nassella pulchra*
- *Danthonia californica* Coastal
- *Festuca californica*
- *Festuca idahoensis* – (*Danthonia californica* – *Koeleria macrantha*)
- *Festuca idahoensis* – *Nassella pulchra*
- *Perideridia kelloggii* – *Danthonia californica*

Classification Comments

None.

References: Evens and Kentner 2006, Jimerson 1993, Keeler-Wolf et al. 2003a, Klein et al. 2015, Michaels 2004

Global Rarity Rank: GNR **State Rarity Rank:** S3

Surveys Used for Description

Total: N=35; San Mateo County (n=35): BUTA006, BUTA081A, CLOV050A, CLOV152A, COASC05, CORT006, CORT007, CORT008, CORT009, CORT038, CORT039, CORT053, CORT065, CORT067, CORT072, CORT075, CORT077, CORT078, CORT079, CORT085, CORT119, CORT137, CORT139, PWSG01A, PWSG02A, PWSG05A, PWVNG01, PWVNG02, PWVNG03, SMAT0006, SMAT0118, SMAT0133, SMAT0161, TOKA016, TOTO031

Festuca idahoensis – *Danthonia californica* Herbaceous Alliance

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	65.7	40.3	1.7	0.2	7				Y
	<i>Rubus ursinus</i>	31.4	6.1	0.5	0.2	11				
	<i>Toxicodendron diversilobum</i>	22.9	5.0	0.4	0.2	7				
Herb	<i>Vulpia bromoides</i>	85.7	6.4	8.0	0.2	28	Y			Y
	<i>Danthonia californica</i>	77.1	19.1	24.4	0.2	89	Y			Y
	<i>Aira caryophyllea</i>	65.7	4.1	5.2	0.2	25				Y
	<i>Bromus hordeaceus</i>	65.7	2.6	2.8	0.2	10				Y
	<i>Lolium perenne</i>	62.9	4.3	6.5	0.2	56				Y
	<i>Rumex acetosella</i>	62.9	1.8	2.3	0.2	13				Y
	<i>Sisyrinchium bellum</i>	62.9	0.4	0.4	0.2	3				Y
	<i>Avena spp.</i>	51.4	1.9	2.3	0.2	34				Y
	<i>Geranium dissectum</i>	51.4	1.0	1.5	0.2	14				Y
	<i>Bromus diandrus</i>	48.6	0.9	1.1	0.2	13				
	<i>Bromus carinatus</i>	45.7	2.5	2.4	0.2	21				
	<i>Elymus glaucus</i>	45.7	0.9	1.5	0.2	19				
	<i>Hypochaeris radicata</i>	45.7	0.7	0.8	0.2	6				
	<i>Nassella pulchra</i>	42.9	5.0	6.2	0.2	62				
	<i>Achillea millefolium</i>	42.9	0.8	1.0	0.2	11				
	<i>Eschscholzia californica</i>	42.9	0.7	0.8	0.2	13				
	<i>Anagallis arvensis</i>	42.9	0.3	0.2	0.2	3				
	<i>Vicia sativa</i>	37.1	0.3	0.4	0.2	10				
	<i>Brachypodium distachyon</i>	34.3	4.2	5.1	0.2	48				
	<i>Cirsium vulgare</i>	34.3	0.2	0.3	0.2	4				
	<i>Chlorogalum pomeridianum</i>	31.4	0.8	1.1	0.2	10				
	<i>Plantago erecta</i>	31.4	0.7	0.8	0.2	9				
	<i>Linum bienne</i>	31.4	0.6	0.7	0.2	5.9701				
	<i>Holcus lanatus</i>	31.4	0.6	0.7	0.2	5				
	<i>Briza minor</i>	31.4	0.2	0.3	0.2	8				
	<i>Sonchus asper</i>	31.4	0.1	0.1	0.2	3				
	<i>Plantago lanceolata</i>	28.6	2.2	2.0	0.2	25				
	<i>Cynosurus echinatus</i>	25.7	0.8	1.3	0.2	34				
	<i>Clarkia rubicunda</i>	25.7	0.8	1.2	0.2	17				
	<i>Pteridium aquilinum</i>	25.7	0.8	0.8	0.2	15				
	<i>Sidalcea malviflora</i>	25.7	0.5	0.6	0.2	9				
<i>Silene gallica</i>	25.7	0.1	0.1	0.2	1					
<i>Festuca idahoensis</i>	22.9	4.5	6.0	10	47					
<i>Juncus spp.</i>	22.9	0.6	1.0	0.2	17					

	<i>Trifolium dubium</i>	22.9	0.5	0.4	0.2	10	
	<i>Briza maxima</i>	20.0	2.9	4.6	0.2	60	
	<i>Koeleria macrantha</i>	20.0	0.4	0.5	0.2	6	
	<i>Lotus corniculatus</i>	20.0	0.4	0.4	0.2	12.552	
	<i>Phalaris aquatica</i>	20.0	0.3	0.4	0.2	8	
	<i>Vulpia microstachys</i>	20.0	0.1	0.2	0.2	4	
	<i>Erodium cicutarium</i>	20.0	0.1	0.1	0.2	1	
Non-Vascular							
	Moss	60.0	60.0	0.5	0.2	10	Y

***Danthonia californica* – *Nassella pulchra* Association**

Common Name: California Oatgrass – Purple Needlegrass Patches

Alliance: *Festuca idahoensis* – *Danthonia californica* Herbaceous Alliance

Local Vegetation Description

The California Oatgrass – Purple Needlegrass Association forms an intermittent to continuous herbaceous layer. The shrub layer is sparse and the tree layer is absent. Characteristic herbs include *Danthonia californica*, *Nassella pulchra*, and *Vulpia bromoides*. Those herbs often present include *Achillea millefolium*, *Aira caryophyllea*, *Bromus carinatus*, *Bromus hordeaceus*, *Lolium perenne*, *Plantago erecta*, *Sisyrinchium bellum*, and *Sonchus asper*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis*, and commonly associated non-vascular plants include Moss.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0.0 – 0.2	no data	no data
Shrub	1.9	0 – 7	0.3	0 – 0.5
Herb	73.9	35 – 95	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 218 m, Range 23 – 386 m

Aspect: SW (2), NE (2), NW (2), SE (1), S (1)

Slope: Mean 5.8 degrees, Range 2 – 11 degrees

Macro Topography: Lower 1/3 of slope (2), Middle 1/3 of slope (2), Upper 1/3 of slope (1), Draw (1)

Large Rock: Mean 2.7%, Range 0.0 – 8.0%

Small Rock: Mean 6.4%, Range 0.0 – 19.0%

Fines Cover: Mean 5.7%, Range 0.2 – 20.0%

Litter Cover: Mean 15.4%, Range 0.2 – 76%

Soil Texture (field assessed): Loam, (class unknown) (1), Medium to very fine, sandy loam (1)

Geology (field or map data): Serpentine (2), Ultramafic rocks, mostly serpentine (2), Volcanic and metavolcanic rocks (2), Sandstone and other sedimentary (1), Shale and other sedimentary (1), Sandstone (1)

San Mateo County Watersheds: San Mateo Bayside (6), Pacifica (1), Palo Alto (1), San Francisco Coastal (1)

Site Impacts

Danthonia californica – *Nassella pulchra* Association
Festuca idahoensis – *Danthonia californica* Herbaceous Alliance

This association has moderate non-native plant cover (average 40.2%) relative to native cover. Non- native species that occur with highest frequency and abundance include *Aira caryophyllea*, *Anagallis arvensis*, *Avena* spp., *Brachypodium distachyon*, *Briza minor*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Cynosurus echinatus*, *Daucus carota*, *Erodium cicutarium*, *Geranium dissectum*, *Hypochaeris glabra*, *Hypochaeris radicata*, *Linum bienne*, *Logfia gallica*, *Lolium perenne*, *Plantago lanceolata*, *Rumex acetosella*, *Sherardia arvensis*, *Silene gallica*, *Sonchus asper*, *Torilis nodosa*, *Trifolium dubium*, *Vicia sativa*, and *Vulpia bromoides*.

Classification Comments

None.

References: Klein et al. 2015

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=9; San Mateo County (n=9): CORT038, CORT039, CORT085, CORT119, CORT139, PWVNG01, PWVNG02, PWVNG03, SMAT0161

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	55.6	34.5	1.3	0.2	5				Y
	<i>Rubus ursinus</i>	33.3	3.5	0.1	0.2	0.2				
	<i>Frangula californica</i>	22.2	3.1	0.0	0.2	0.2				
Herb	<i>Danthonia californica</i>	100.0	19.8	23.6	3	76				Y
	<i>Nassella pulchra</i>	100.0	16.5	21.1	3	62				Y
	<i>Vulpia bromoides</i>	88.9	4.1	5.3	0.2	20				Y
	<i>Lolium perenne</i>	66.7	8.1	12.6	2	56				Y
	<i>Bromus carinatus</i>	66.7	4.3	4.3	3	21				Y
	<i>Bromus hordeaceus</i>	66.7	3.6	3.4	0.2	10				Y
	<i>Aira caryophyllea</i>	66.7	2.1	2.4	0.2	14				Y
	<i>Sisyrinchium bellum</i>	66.7	0.4	0.4	0.2	2				Y
	<i>Plantago erecta</i>	55.6	1.3	1.5	0.2	9				Y
	<i>Sonchus asper</i>	55.6	0.3	0.4	0.2	3				Y
	<i>Achillea millefolium</i>	55.6	0.2	0.1	0.2	0.2				Y
	<i>Brachypodium distachyon</i>	44.4	5.0	4.4	0.2	20				
	<i>Avena</i> spp.	44.4	4.7	4.8	3	34				
<i>Geranium dissectum</i>	44.4	1.1	1.8	0.2	14					

Danthonia californica – *Nassella pulchra* Association
Festuca idahoensis – *Danthonia californica* Herbaceous Alliance

<i>Anagallis arvensis</i>	44.4	0.7	0.4	0.2	3	
<i>Torilis nodosa</i>	44.4	0.6	0.8	0.2	7	
<i>Hypochaeris radicata</i>	44.4	0.4	0.4	0.2	2	
<i>Vicia sativa</i>	44.4	0.2	0.2	0.2	1	
<i>Elymus multisetus</i>	33.3	1.6	2.2	3	9	
<i>Calystegia subacaulis</i>	33.3	1.2	1.4	0.2	9	
<i>Bromus diandrus</i>	33.3	1.0	0.7	0.2	3	
<i>Wyethia angustifolia</i>	33.3	1.0	0.4	0.2	3	
<i>Linum bienne</i>	33.3	0.3	0.4	0.2	3	
<i>Chlorogalum</i>						
<i>pomeridianum</i>	33.3	0.2	0.2	0.2	1	
<i>Sherardia arvensis</i>	33.3	0.1	0.2	0.2	1	
<i>Erodium cicutarium</i>	33.3	0.1	0.1	0.2	0.2	
<i>Sidalcea malviflora</i>	33.3	0.1	0.1	0.2	0.2	
<i>Daucus pusillus</i>	33.3	0.1	0.1	0.2	0.2	
<i>Silene gallica</i>	33.3	0.1	0.1	0.2	0.2	
<i>Dichelostemma capitatum</i>	33.3	0.1	0.2	0.2	1	
<i>Eschscholzia californica</i>	33.3	0.1	0.1	0.2	0.2	
<i>Elymus glaucus</i>	33.3	0.1	0.1	0.2	0.2	
<i>Clarkia rubicunda</i>	22.2	2.3	3.4	14	17	
<i>Carduus pycnocephalus</i>	22.2	1.5	1.1	0.2	10	
<i>Trifolium dubium</i>	22.2	1.5	1.1	0.2	10	
<i>Plantago lanceolata</i>	22.2	1.0	0.4	0.2	3	
<i>Luzula comosa</i>	22.2	0.9	0.6	2	3	
<i>Lotus wrangelianus</i>	22.2	0.3	0.5	0.4	4	
<i>Layia platyglossa</i>	22.2	0.3	0.4	1	3	
<i>Vulpia microstachys</i>	22.2	0.3	0.5	0.2	4	
<i>Koeleria macrantha</i>	22.2	0.2	0.2	0.2	2	
<i>Daucus carota</i>	22.2	0.2	0.2	0.2	2	
<i>Acaena pinnatifida</i>	22.2	0.1	0.1	0.2	1	
<i>Logfia gallica</i>	22.2	0.1	0.0	0.2	0.2	
<i>Eriogonum nudum</i>	22.2	0.1	0.0	0.2	0.2	
<i>Cynosurus echinatus</i>	22.2	0.1	0.1	0.2	1	
<i>Trifolium macraei</i>	22.2	0.1	0.0	0.2	0.2	
<i>Hypochaeris glabra</i>	22.2	0.1	0.0	0.2	0.2	
<i>Briza minor</i>	22.2	0.1	0.0	0.2	0.2	
<i>Triteleia laxa</i>	22.2	0.1	0.0	0.2	0.2	
<i>Rumex acetosella</i>	22.2	0.0	0.0	0.2	0.2	
<i>Perideridia kelloggii</i>	22.2	0.0	0.0	0.2	0.2	
<i>Delphinium variegatum</i>	22.2	0.0	0.0	0.2	0.2	
<i>Clarkia gracilis</i>	22.2	0.0	0.0	0.2	0.2	
<i>Calochortus luteus</i>	22.2	0.0	0.0	0.2	0.2	
Non-Vascular						
Moss	55.6	55.6	0.1	0.2	0.2	Y

***Danthonia californica* Coastal Association**

Common Name: California Oatgrass Valley Grassland Patches

Alliance: *Festuca idahoensis* – *Danthonia californica* Herbaceous Alliance

Local Vegetation Description

The California Oatgrass Valley Grassland Association forms a continuous herbaceous layer. The shrub layer is open and the tree layer is sparse. Dominant herbs include *Danthonia californica*, and characteristic herbs include *Bromus hordeaceus*, *Geranium dissectum*, *Holcus lanatus*, *Lolium perenne*, and *Vulpia bromoides*. Those herbs often present include *Aira caryophylla*, *Anagallis arvensis*, *Avena* spp., *Brachypodium distachyon*, *Briza minor*, *Bromus diandrus*, *Cirsium vulgare*, *Hypochaeris radicata*, *Linum bienne*, *Lotus corniculatus*, *Phalaris aquatica*, *Plantago lanceolata*, *Rumex acetosella*, *Sisyrinchium bellum*, and *Vicia sativa*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.6	0 – 7	no data	no data
Hardwood	0.3	0 – 4	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	4.2	0 – 12	0.3	0 – 0.5
Herb	81.5	78 – 85	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 141 m, Range 18 – 577 m

Aspect: NW (2), SE (2), SW (2), Flat (1), N (1)

Slope: Mean 6 degrees, Range 0 – 19 degrees

Macro Topography: Upper 1/3 of slope (3), Middle 1/3 of slope (2), Other (2), Bottom to Lower 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: Mean 0.3%, Range 0.0 – 2.2%

Fines Cover: Mean 30.0%, Range 0.2 – 64.5%

Litter Cover: Mean 26.7%, Range 0.2 – 92%

Soil Texture (field assessed): Moderately coarse, sandy loam (1), Moderately fine clay loam (1)

Geology (field or map data): Alluvium (4), Sandstone and other sedimentary (4), Sandstone, shale, and conglomerate (3), Shale and other sedimentary (1), Granitic (generic) (1)

San Mateo County Watersheds: Ano Nuevo (6), Pescadero Creek (3), Palo Alto (2), Pacifica (1), Tunitas Creek (1)

Danthonia californica Coastal Association
Festuca idahoensis – *Danthonia californica* Herbaceous Alliance

Site Impacts

This association has greater cover of non-native (average 52.9%) than native. Non-native species that occur with highest frequency and abundance include *Aira caryophyllea*, *Anagallis arvensis*, *Avena* spp., *Brachypodium distachyon*, *Briza maxima*, *Briza minor*, *Bromus diandrus*, *Bromus hordeaceus*, *Cirsium vulgare*, *Crepis vesicaria*, *Cynosurus echinatus*, *Geranium dissectum*, *Holcus lanatus*, *Hypochaeris radicata*, *Linum bienne*, *Lolium perenne*, *Lotus corniculatus*, *Parentucellia viscosa*, *Phalaris aquatica*, *Picris echioides*, *Plantago lanceolata*, *Rumex acetosella*, *Sonchus asper*, *Trifolium angustifolium*, *Trifolium dubium*, *Trifolium subterraneum*, *Vicia sativa*, *Vicia tetrasperma*, *Vicia villosa*, and *Vulpia bromoides*.

Classification Comments

This new association name, first used for Marin County, merges previously used concepts *Danthonia californica* – *Aira caryophyllea* and *Danthonia californica* – (*Briza maxima* – *Vulpia bromoides*) Associations.

References: Keeler-Wolf et al. 2003a, Klein et al. 2015

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=14; San Mateo County (n=14): BUTA006, BUTA081A, CLOV050A, CLOV152A, CORT006, CORT007, CORT008, CORT009, CORT053, CORT137, SMAT0006, SMAT0118, TOKA016, TOTO031

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	92.9	67.5	2.7	0.2	7		Y		Y
	<i>Rubus ursinus</i>	42.9	5.3	0.4	0.2	2				
	<i>Toxicodendron diversilobum</i>	28.6	3.3	0.2	0.2	2				
	<i>Frangula californica</i>	21.4	3.0	0.2	0.2	2				
	Herb	<i>Danthonia californica</i>	100.0	34.6	45.7	5.0	209			Y
<i>Vulpia bromoides</i>		92.9	9.8	11.9	0.2	28				Y
<i>Lolium perenne</i>		85.7	4.2	6.3	0.2	38				Y
<i>Bromus hordeaceus</i>		85.7	2.7	2.9	0.48	08	7.94			Y
<i>Geranium dissectum</i>		78.6	1.6	2.2	0.2	10				Y
<i>Holcus lanatus</i>		78.6	1.6	1.8	0.2	5				Y
<i>Rumex acetosella</i>		71.4	1.4	1.8	0.2	12				Y
<i>Hypochaeris radicata</i>		71.4	1.4	1.6	0.2	6				Y

Danthonia californica Coastal Association
Festuca idahoensis – *Danthonia californica* Herbaceous Alliance

<i>Anagallis arvensis</i>	71.4	0.3	0.3	0.2	2	Y
<i>Sisyrinchium bellum</i>	71.4	0.2	0.4	0.2	2	Y
<i>Aira caryophylla</i>	64.3	3.9	4.4	0.2	20.673	Y
<i>Avena spp.</i>	64.3	0.6	0.8	0.2	3	Y
<i>Briza minor</i>	64.3	0.4	0.8	0.2	8	Y
<i>Plantago lanceolata</i>	57.1	4.8	4.7	0.2	25	Y
<i>Linum bienne</i>	57.1	1.3	1.6	0.2	5.9701	Y
<i>Bromus diandrus</i>	57.1	0.5	0.6	0.2	2.6515	Y
<i>Cirsium vulgare</i>	57.1	0.1	0.1	0.2	0.4367	Y
<i>Brachypodium distachyon</i>	50.0	7.4	9.8	6.7308	48	Y
<i>Lotus corniculatus</i>	50.0	1.0	1.0	0.2	12.552	Y
<i>Phalaris aquatica</i>	50.0	0.6	1.0	0.2	8	Y
<i>Vicia sativa</i>	50.0	0.6	0.9	0.2	10	Y
<i>Trifolium dubium</i>	42.9	0.3	0.3	0.2	2.4876	
<i>Elymus glaucus</i>	35.7	1.2	1.9	0.2	19	
<i>Juncus spp.</i>	35.7	1.0	1.7	0.2	17	
<i>Plantago ovata</i>	35.7	0.9	1.9	0.2	18	
<i>Vicia tetrasperma</i>	35.7	0.2	0.2	0.3788	1.2552	
<i>Trifolium angustifolium</i>	35.7	0.2	0.2	0.2	1.0101	
<i>Camissonia ovata</i>	35.7	0.1	0.1	0.2	0.2	
<i>Sonchus asper</i>	35.7	0.1	0.1	0.2	0.2	
<i>unknown Poaceae</i>	28.6	2.4	2.5	4.4776	10.985	
<i>Cynosurus echinatus</i>	28.6	1.9	3.1	0.2	34	
<i>Juncus patens</i>	28.6	0.1	0.1	0.2	0.3788	
<i>Symphotrichum chilense</i>	28.6	0.1	0.1	0.2	0.2	
<i>Trifolium subterraneum</i>	21.4	0.6	0.6	0.2	8.4577	
<i>Bromus carinatus</i>	21.4	0.6	0.6	0.9615	5	
<i>Parentucellia viscosa</i>	21.4	0.2	0.2	0.3788	2	
<i>Vicia villosa</i>	21.4	0.1	0.1	0.2	1	
<i>Juncus occidentalis</i>	21.4	0.1	0.1	0.2	1.0101	
<i>Carex tumulicola</i>	21.4	0.1	0.1	0.2	0.4367	
<i>Briza maxima</i>	21.4	0.1	0.1	0.2	0.4367	
<i>Picris echioides</i>	21.4	0.0	0.0	0.2	0.2	
<i>Crepis vesicaria</i>	21.4	0.0	0.0	0.2	0.2	
Non-Vascular						
Moss	42.9	42.9	0.1	0.2	0.2	

***Festuca californica* Association**

Common Name: California Fescue Patches

Alliance: *Festuca idahoensis* – *Danthonia californica* Herbaceous Alliance

Local Vegetation Description

The California Fescue Association forms a continuous herbaceous layer. The shrub layer is open and the tree layer is sparse or absent. Dominant herbs include *Festuca californica*. Those herbs often present include *Achillea millefolium* and *Galium porrigens*, and herbs that are sometimes present include *Aira caryophyllea*, *Anagallis arvensis*, *Avena* spp., *Bromus carinatus*, *Bromus diandrus*, *Chlorogalum pomeridianum*, *Claytonia perfoliata*, *Clinopodium douglasii*, *Dichelostemma capitatum*, *Eriogonum nudum*, *Eschscholzia californica*, *Festuca idahoensis*, *Galium aparine*, *Koeleria macrantha*, *Luzula comosa*, *Pentagramma triangularis*, *Plantago erecta*, *Pteridium aquilinum*, *Ranunculus californicus*, *Rumex acetosella*, *Silene gallica*, *Sisyrinchium bellum*, *Thermopsis californica*, and *Vicia villosa*. Commonly associated emergent shrubs at sparse cover include *Toxicodendron diversilobum*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.5	0 – 1	1.5	1 – 2
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	4.0	0.6 – 7.4	0.8	0.5 – 1
Herb	75.0	70 – 80	0.8	0.5 – 1

Local Environmental Description

Elevation: Mean 227 m, Range 226 – 227 m

Aspect: N (1), NW (1)

Slope: Mean 24 degrees, Range 23 – 25 degrees

Macro Topography: Upper 1/3 of slope (2)

Large Rock: 0.4%

Small Rock: 11.0%

Fines Cover: Mean 7.6%, Range 0.2 – 15.0%

Litter Cover: Mean 35.6%, Range 0.2 – 71%

Soil Texture (field assessed): Moderately fine sandy clay loam (1)

Geology (field or map data): Mixed sedimentary (1), Sandstone, shale, and conglomerate (1)

San Mateo County Watersheds: San Mateo Bayside (2)

Site Impacts

Festuca californica Association
Festuca idahoensis – *Danthonia californica* Herbaceous Alliance

This association has low non-native plant cover (average 14.3%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira caryophylla*, *Anagallis arvensis*, *Avena* spp., *Bromus diandrus*, *Rumex acetosella*, *Silene gallica*, and *Vicia villosa*.

Classification Comments

None.

References: Evens and Kentner 2006, Klein et al. 2015

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=2; San Mateo County (n=2): CORT078, SMAT0133

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree										
	<i>Quercus agrifolia</i>	50.0	50.0	0.5	1	1				Y
Shrub										
	<i>Baccharis pilularis</i>	100.0	30.2	1.1	0.2	2			Y	Y
	<i>Diplacus aurantiacus</i>	100.0	30.2	1.1	0.2	2			Y	Y
	<i>Toxicodendron diversilobum</i>	100.0	18.0	0.2	0.2	0.2				Y
	<i>Ceanothus thyrsiflorus</i>	50.0	6.8	0.5	1	1				Y
	<i>Prunus ilicifolia</i>	50.0	6.8	0.5	1	1				Y
	<i>Eriophyllum confertiflorum</i>	50.0	6.8	0.5	1	1				Y
	<i>Frangula californica</i>	50.0	1.4	0.1	0.2	0.2				Y
Herb										
	<i>Festuca californica</i>	100.0	60.5	60.0	20	100		Y		Y
	<i>Pteridium aquilinum</i>	100.0	9.7	8.5	2	15				Y
	<i>Salvia spathacea</i>	50.0	8.7	7.5	15	15				Y
	<i>Aira caryophylla</i>	50.0	5.8	5.0	10	10				Y
	<i>Briza maxima</i>	50.0	4.1	3.5	7	7				Y
	<i>Vulpia myuros</i>	50.0	2.9	2.5	5	5				Y
	<i>Heterotheca sessiliflora</i>	50.0	2.9	2.5	5	5				Y
	<i>Rumex acetosella</i>	50.0	2.9	2.5	5	5				Y
	<i>Eriogonum nudum</i>	50.0	0.6	0.5	1	1				Y
	<i>Achillea millefolium</i>	50.0	0.6	0.5	1	1				Y
	<i>Eschscholzia californica</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Clinopodium douglasii</i>	50.0	0.1	0.1	0.2	0.2				Y

	<i>Acaena pinnatifida</i>	50.0	0.1	0.1	0.2	0.2	Y
	<i>Angelica hendersonii</i>	50.0	0.1	0.1	0.2	0.2	Y
	<i>Chlorogalum pomeridianum</i>	50.0	0.1	0.1	0.2	0.2	Y
	<i>Allium dichlamydeum</i>	50.0	0.1	0.1	0.2	0.2	Y
	<i>Luzula comosa</i>	50.0	0.1	0.1	0.2	0.2	Y
	<i>Silene gallica</i>	50.0	0.1	0.1	0.2	0.2	Y
	<i>Lupinus spp.</i>	50.0	0.1	0.1	0.2	0.2	Y
	<i>Scrophularia californica</i>	50.0	0.1	0.1	0.2	0.2	Y
	<i>Iris douglasiana</i>	50.0	0.1	0.1	0.2	0.2	Y
	<i>Castilleja affinis</i>	50.0	0.1	0.1	0.2	0.2	Y
	<i>Heracleum maximum</i>	50.0	0.1	0.1	0.2	0.2	Y
Non-Vascular							
	Moss	50.0	50.0	0.1	0.2	0.2	Y

***Festuca idahoensis* – (*Danthonia californica* – *Koeleria macrantha*) Association**

Common Name: Blue Fescue – (Creeping Ryegrass – June Grass) Patches

Alliance: *Festuca idahoensis* – *Danthonia californica* Herbaceous Alliance

Local Vegetation Description

The Blue Fescue – (Creeping Ryegrass – June Grass) Association forms an intermittent to continuous herbaceous layer. The shrub layer is sparse to absent and the tree layer is typically absent. Characteristic herbs include *Achillea millefolium*, *Aira caryophylla*, *Bromus carinatus*, *Elymus glaucus*, *Eschscholzia californica*, *Festuca idahoensis*, *Rumex acetosella*, and *Vulpia bromoides*. Herbs that are often present include *Avena* spp., *Bromus diandrus*, *Chlorogalum pomeridianum*, *Clarkia rubicunda*, *Koeleria macrantha*, *Plantago erecta*, *Pteridium aquilinum*, , and *Sidalcea malviflora*. Commonly associated non-vascular plants include Moss.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0.0 – 0.2	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	2.9	0 – 11	no data	no data
Herb	74.5	58 – 96	no data	no data

Local Environmental Description

Elevation: Mean 370 m, Range 114 – 746 m

Aspect: W (3), NW (2), NE (1)

Slope: Mean 17 degrees, Range 7 – 35 degrees

Macro Topography: Upper 1/3 of slope (3), Ridge top (2)

Large Rock: Mean 0.4%, Range 0.0 – 3.0%

Small Rock: Mean 0.0%, Range 0.0 – 0.0%

Fines Cover: Mean 2.9%, Range 0.2 – 15%

Litter Cover: Mean 4.5%, Range 0.2 – 30%

Soil Texture (field assessed): no data

Geology (field or map data): Sandstone and other sedimentary (3), Sandstone, shale, and conglomerate (3), Serpentine (1)

San Mateo County Watersheds: San Mateo Bayside (4), Half Moon Bay (1), Pescadero Creek (1), San Gregorio Creek (1)

Site Impacts

This association has moderate non-native plant cover (average 39.7%) relative to

Festuca idahoensis – (*Danthonia californica* – *Koeleria macrantha*) Association
Festuca idahoensis – *Danthonia californica* Herbaceous Alliance

native cover. Non- native species that occur with highest frequency and abundance include *Aira caryophyllea*, *Avena* spp., *Bromus diandrus*, *Bromus hordeaceus*, *Cirsium vulgare*, *Crepis vesicaria*, *Cynosurus echinatus*, *Geranium dissectum*, *Lolium perenne*, *Rumex acetosella*, and *Vulpia bromoides*.

Classification Comments

This association name has been updated to include *Koeleria macrantha*, to better align with the NVC.

References: Klein et al. 2015

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=7; San Mateo County (n=7): COASC05, CORT065, CORT072, CORT075, CORT077, CORT079, PWSG01A

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	42.9	13.4	0.9	0.2	5				
	<i>Rubus ursinus</i>	28.6	15.1	1.9	2	11				
Herb	<i>Achillea millefolium</i>	100.0	3.7	4.9	0.2	11				Y
	<i>Rumex acetosella</i>	100.0	3.5	5.0	2	12				Y
	<i>Eschscholzia californica</i>	100.0	2.4	3.3	0.2	13				Y
	<i>Festuca idahoensis</i>	85.7	19.0	26.0	10	47				Y
	<i>Aira caryophyllea</i>	85.7	8.0	12.0	0.2	25				Y
	<i>Vulpia bromoides</i>	85.7	5.7	7.6	0.2	24				Y
	<i>Bromus carinatus</i>	85.7	4.0	4.0	0.2	10				Y
	<i>Elymus glaucus</i>	85.7	1.9	2.9	0.2	13				Y
	<i>Chlorogalum pomeridianum</i>	71.4	2.7	4.1	3	10				Y
	<i>Plantago erecta</i>	71.4	1.8	2.0	0.2	4				Y
	<i>Bromus diandrus</i>	71.4	1.3	2.3	0.2	13				Y
	<i>Pteridium aquilinum</i>	71.4	1.0	1.5	0.2	4				Y
	<i>Clarkia rubicunda</i>	71.4	0.9	1.3	0.2	5				Y
	<i>Sidalcea malviflora</i>	57.1	2.2	2.9	3	9				Y
	<i>Avena</i> spp.	57.1	1.7	3.0	0.2	15				Y
	<i>Koeleria macrantha</i>	57.1	1.3	1.9	0.2	6				Y
	<i>Lasthenia californica</i>	42.9	2.5	1.6	0.2	10				
<i>Bromus hordeaceus</i>	42.9	2.0	2.7	2	9					
<i>Nassella pulchra</i>	42.9	0.8	1.0	0.2	5					

Festuca idahoensis – (*Danthonia californica* – *Koeleria macrantha*) Association
Festuca idahoensis – *Danthonia californica* Herbaceous Alliance

<i>Cirsium vulgare</i>	42.9	0.8	1.2	0.2	4
<i>Geranium dissectum</i>	42.9	0.5	0.7	0.2	3
<i>Heterotheca sessiliflora</i>	42.9	0.5	0.7	0.2	4
<i>Eriogonum latifolium</i>	42.9	0.3	0.5	0.2	2
<i>Ranunculus californicus</i>	42.9	0.2	0.2	0.2	1
<i>Sisyrinchium bellum</i>	42.9	0.1	0.1	0.2	0.2
<i>Briza maxima</i>	28.6	10.2	16.1	53	60
<i>Lolium perenne</i>	28.6	1.4	2.0	6	8
<i>Crepis vesicaria</i>	28.6	1.3	1.6	2	9
<i>Eriogonum nudum</i>	28.6	0.7	0.5	0.2	3
<i>Danthonia californica</i>	28.6	0.7	0.5	0.2	3
<i>Lupinus nanus</i>	28.6	0.7	1.0	3	4
<i>Madia sativa</i>	28.6	0.5	0.6	0.2	4
<i>Elymus multisetus</i>	28.6	0.5	0.7	2	3
<i>Calystegia subacaulis</i>	28.6	0.2	0.2	0.2	1
<i>Trifolium willdenovii</i>	28.6	0.2	0.2	0.2	1
<i>Cynosurus echinatus</i>	28.6	0.1	0.2	0.2	1
<i>Silene gallica</i>	28.6	0.1	0.2	0.2	1
<i>Monardella villosa</i>	28.6	0.1	0.1	0.2	0.2
<i>Vulpia microstachys</i>	28.6	0.1	0.1	0.2	0.2
<i>Lupinus bicolor</i>	28.6	0.1	0.1	0.2	0.2
<i>Arabis blepharophylla</i>	28.6	0.1	0.1	0.2	0.2
<i>Delphinium variegatum</i>	28.6	0.0	0.1	0.2	0.2
<i>Amsinckia spp.</i>	28.6	0.0	0.1	0.2	0.2
<i>Allium fimbriatum</i>	28.6	0.0	0.1	0.2	0.2
<i>Castilleja exserta</i>	28.6	0.0	0.1	0.2	0.2
<i>Juncus spp.</i>	28.6	0.0	0.1	0.2	0.2
Non-Vascular					
Lichen	50	25.0	0.1	0.2	0.2
Moss	50	25.0	0.1	0.2	0.2

***Festuca idahoensis* – *Nassella pulchra* Provisional Association**

Common Name: Blue Fescue – Purple Needlegrass Patches

Alliance: *Festuca idahoensis* – *Danthonia californica* Herbaceous Alliance

Local Vegetation Description

The Blue Fescue – Purple Needlegrass Association forms an intermittent to continuous herbaceous layer. The shrub layer is absent and the tree layer is absent. Characteristic herbs include *Achillea millefolium*, *Festuca idahoensis*, *Hypochaeris radicata*, and *Nassella pulchra*. Those herbs often present include *Anagallis arvensis*, *Avena* spp., *Briza maxima*, *Bromus diandrus*, *Chlorogalum pomeridianum*, *Danthonia californica*, *Elymus glaucus*, *Eriogonum latifolium*, *Erodium botrys*, *Eschscholzia californica*, *Hypochaeris glabra*, *Koeleria macrantha*, *Lolium perenne*, *Melica californica*, *Plantago erecta*, *Plantago lanceolata*, *Rumex acetosella*, *Sidalcea malviflora*, *Silene gallica*, *Sisyrinchium bellum*, and *Vulpia bromoides*.

Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.0	0 – 0	no data	no data
Herb	66.5	60 – 73	no data	no data

Local Environmental Description

Elevation: Mean 566 m, Range 366 – 766 m

Aspect: W (1)

Slope: 6 degrees

Macro Topography: Ridge top (1)

Large Rock: no data

Small Rock: no data

Fines Cover: 1.0%

Litter Cover: 0.2%

Soil Texture (field assessed): no data

Geology (field or map data): Sandstone and other sedimentary (1), Volcanic and metavolcanic rocks (1)

San Mateo County Watersheds: Half Moon Bay (1), San Gregorio Creek (1)

Site Impacts

This association has moderate non-native plant cover (average 29.2%) relative to

Festuca idahoensis – *Nassella pulchra* Provisional Association
Festuca idahoensis – *Danthonia californica* Herbaceous Alliance

native cover. Non- native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Avena* spp., *Briza maxima*, *Bromus diandrus*, *Bromus hordeaceus*, *Cynosurus echinatus*, *Erodium botrys*, *Erodium cicutarium*, *Hypochaeris glabra*, *Hypochaeris radicata*, *Logfia gallica*, *Lolium perenne*, *Plantago lanceolata*, *Rumex acetosella*, *Silene gallica*, and *Vulpia bromoides*.

Classification Comments

This association is considered provisional since it is under-sampled in its expected range. It was newly described for Marin County (Buck-Diaz et al. 2021).

References: Buck-Diaz et al. 2021

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=2; San Mateo County (n=2): CORT067, PWSG02A

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Festuca idahoensis</i>	100.0	12.9	14.0	10	18				Y
	<i>Nassella pulchra</i>	100.0	10.2	10.0	10	10				Y
	<i>Rumex acetosella</i>	100.0	6.5	8.0	3	13				Y
	<i>Vulpia bromoides</i>	100.0	3.9	5.6	0.2	11				Y
	<i>Eschscholzia californica</i>	100.0	2.7	2.5	2	3				Y
	<i>Bromus hordeaceus</i>	100.0	2.5	3.6	0.2	7				Y
	<i>Elymus glaucus</i>	100.0	1.2	1.6	0.2	3				Y
	<i>Melica californica</i>	100.0	1.2	1.6	0.2	3				Y
	<i>Sisyrinchium bellum</i>	100.0	0.8	1.1	0.2	2				Y
	<i>Lotus wrangelianus</i>	50.0	6.8	5.0	10	10				Y
	<i>Bromus carinatus</i>	50.0	6.8	5.0	10	10				Y
	<i>Crepis vesicaria</i>	50.0	4.8	7.0	14	14				Y
	<i>Calystegia collina</i>	50.0	4.4	6.5	13	13				Y
	<i>Chlorogalum pomeridianum</i>	50.0	3.1	4.5	9	9				Y
	<i>Bromus diandrus</i>	50.0	3.1	4.5	9	9				Y
	<i>Lolium perenne</i>	50.0	2.8	4.1	8.2	8.2				Y
	<i>Avena</i> spp.	50.0	2.4	3.5	7	7				Y
	<i>Elymus multisetus</i>	50.0	2.4	3.5	7	7				Y
	<i>Microseris douglasii</i>	50.0	2.2	1.6	3.2	3.2				Y
	<i>Trifolium microdon</i>	50.0	2.0	1.5	3	3				Y
	<i>Trifolium</i>	50.0	2.0	1.5	3	3				Y

Festuca idahoensis – *Nassella pulchra* Provisional Association
Festuca idahoensis – *Danthonia californica* Herbaceous Alliance

<i>albopurpureum</i>						
<i>Aira caryophyllea</i>	50.0	2.0	1.5	3	3	Y
<i>Daucus pusillus</i>	50.0	2.0	1.5	3	3	Y
<i>Eriogonum nudum</i>	50.0	2.0	1.5	3	3	Y
<i>Koeleria macrantha</i>	50.0	2.0	1.5	3	3	Y
<i>Poa unilateralis</i>	50.0	1.0	1.5	3	3	Y
<i>Trifolium willdenovii</i>	50.0	1.0	1.5	3	3	Y
<i>Phacelia imbricata</i>	50.0	0.7	1.0	2	2	Y
<i>Cynosurus echinatus</i>	50.0	0.3	0.5	1	1	Y
<i>Sanicula bipinnatifida</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Castilleja densiflora</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Vulpia microstachys</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Calandrinia ciliata</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Delphinium hesperium</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Claytonia perfoliata</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Brodiaea terrestris</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Silene gallica</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Astragalus gambelianus</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Crassula connata</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Aphanes arvensis</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Epilobium brachycarpum</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Anagallis arvensis</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Lactuca saligna</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Poa secunda</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Dichelostemma capitatum</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Lasthenia californica</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Guillenia lasiophylla</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Trifolium bifidum</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Hypochaeris glabra</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Plantago erecta</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Grindelia camporum</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Trifolium macraei</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Perideridia kelloggii</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Danthonia californica</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Hypochaeris radicata</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Sidalcea malviflora</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Erodium cicutarium</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Monardella villosa</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Arrhenatherum elatius</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Vicia sativa</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Clarkia purpurea</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Melilotus spp.</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Cirsium vulgare</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Wyethia glabra</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Stachys ajugoides</i>	50.0	0.1	0.1	0.2	0.2	Y

Festuca idahoensis – *Nassella pulchra* Provisional Association
Festuca idahoensis – *Danthonia californica* Herbaceous Alliance

Non-Vascular	<i>Brodiaea elegans</i>	50.0	0.1	0.1	0.2	0.2		Y
	Moss	100.0	100.0	5.1	0.2	10	Y	Y

***Perideridia kelloggii* – *Danthonia californica* Provisional Association**

Common Name: Yampah – Creeping Ryegrass Patches

Alliance: *Festuca idahoensis* – *Danthonia californica* Herbaceous Alliance

Local Vegetation Description

The Yampah – Creeping Ryegrass Association forms an intermittent to continuous herbaceous layer. The shrub layer is absent and the tree layer is absent. Dominant herbs include *Lolium perenne* and *Perideridia kelloggii*, and characteristic herbs include *Chlorogalum pomeridianum*, *Danthonia californica*, *Lactuca saligna*, *Lotus wrangelianus*, *Ranunculus californicus*, *Sisyrinchium bellum*, and *Triteleia laxa*. Those herbs often present include *Carex serratodens*, *Castilleja rubicundula* ssp. *lithospermoides*, *Deschampsia danthonioides*, *Elymus glaucus*, *Elymus trachycaulus*, *Hemizonia congesta*, *Hordeum brachyantherum*, *Hypochaeris radicata*, *Juncus bufonius*, *Juncus phaeocephalus*, *Lasthenia californica*, *Madia elegans*, *Microseris douglasii*, *Mimulus guttatus*, *Sidalcea diploscypha*, *Trifolium microdon*, *Trifolium willdenovii*, *Vulpia bromoides*, and *Vulpia microstachys*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.0	0.0 – 0.0	no data	no data
Herb	79.0	60 – 98	no data	no data

Local Environmental Description

Elevation: Mean 142 m, Range 140 – 143 m

Aspect: NE (1)

Slope: 5 degrees

Macro Topography: Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: Mean 0.5%, Range 0.0 – 1.0%

Fines Cover: Mean 3.0%, Range 1.0 – 5.0%

Litter Cover: Mean 57.5%, Range 35.0 – 80%

Soil Texture (field assessed): Clay, (class unknown) (1), Moderately fine silty clay loam (1)

Geology (field or map data): Franciscan melange (1), Serpentine (1)

San Mateo County Watersheds: San Mateo Bayside (1)

Other Watersheds, Marin Co.: San Rafael (1)

Perideridia kelloggii – *Danthonia californica* Provisional Association
Festuca idahoensis – *Danthonia californica* Herbaceous Alliance

Site Impacts

This association has moderate non-native plant cover (average 32.7%) relative to native cover. Non- native species that occur with highest frequency and abundance include *Hypochaeris radicata*, *Lactuca saligna*, *Lolium perenne*, and *Vulpia bromoides*.

Classification Comments

This association is considered provisional since it is under-sampled in its expected range. It was newly described for Marin County. Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Buck-Diaz et al. 2020

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=2; San Mateo County (n=1): PWSG05A

Marin County (n=1): HEAD0240

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Perideridia kelloggii</i>	100.0	33.9	28.0	18	38			Y	Y
	<i>Lolium perenne</i>	100.0	32.2	35.5	3	68			Y	Y
	<i>Danthonia californica</i>	100.0	3.7	4.1	0.2	8				Y
	<i>Sisyrinchium bellum</i>	100.0	2.1	1.6	0.2	3				Y
	<i>Chlorogalum pomeridianum</i>	100.0	1.5	1.6	0.2	3				Y
	<i>Ranunculus californicus</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Lactuca saligna</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Lotus wrangelianus</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Triteleia laxa</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Microseris douglasii</i>	50.0	13.7	10.0	20	20				Y
	<i>Hemizonia congesta</i>	50.0	3.6	4.0	8	8				Y
	<i>Hordeum brachyantherum</i>	50.0	2.0	1.5	3	3				Y
	<i>Madia elegans</i>	50.0	2.0	1.5	3	3				Y
	<i>Elymus glaucus</i>	50.0	1.3	1.5	3	3				Y
	<i>Carex serratodens</i>	50.0	1.3	1.5	3	3				Y
	<i>Deschampsia danthonioides</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Trifolium microdon</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Sidalcea diploscypha</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Mimulus guttatus</i>	50.0	0.1	0.1	0.2	0.2				Y

Perideridia kelloggii – *Danthonia californica* Provisional Association
Festuca idahoensis – *Danthonia californica* Herbaceous Alliance

<i>Vulpia bromoides</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Trifolium willdenovii</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Elymus trachycaulus</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Castilleja rubicundula</i> <i>ssp. lithospermoides</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Lasthenia californica</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Vulpia microstachys</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Hypochaeris radicata</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Juncus bufonius</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Juncus phaeocephalus</i>	50.0	0.1	0.1	0.2	0.2	Y

***Grindelia (stricta)* Herbaceous Provisional Alliance**



Common Name: Gum plant patches

NVC Alliance Code: A4179. *Grindelia stricta* - *Grindelia* sp. Wet Mudflat Alliance

Statewide Description

Grindelia stricta or another *Grindelia* species is dominant in the herbaceous layer with *Distichlis spicata*, *Frankenia salina*, *Jaumea carnosa*, *Juncus arcticus*, *Limonium californicum*, *Sarcocornia pacifica* and *Triglochin maritima*.

G. stricta and subspecies of *G. stricta* are assigned to the same alliance. *Grindelia stricta* appears to be broadly tolerant of salt or brackish conditions, as in salt marsh edges or along coastal bluffs or stabilized coastal dunes.

Local Vegetation Description

The Gum plant patches Alliance forms an intermittent to continuous herbaceous layer. The shrub layer is absent to sparse and the tree layer is absent. Dominant herbs include *Grindelia stricta*. Those herbs often present include *Distichlis spicata*, *Jaumea carnosa*, *Potentilla anserina*, and *Sarcocornia pacifica*, and herbs that are sometimes present include *Atriplex prostrata*, *Avena* spp., *Beta vulgaris*, *Cuscuta salina*, and *Polypogon monspeliensis*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
----------	-----------	-----------	------------	------------

Grindelia (stricta) Provisional Herbaceous Alliance

	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0.0 – 0.0	no data	no data
Shrub	0.0	0.0 – 0.2	0.8	0.5 – 1
Herb	72.5	60 – 80	0.9	0 – 2

Local Membership Rule

Grindelia stricta dominates or co-dominates with natives such as *Sarcocornia pacifica*, *Distichlis spicata*, and/or *Frankenia salina* or non-native herbs such as *Polypogon monspeliensis*, *Rumex crispus*, and *Bromus diandrus*. Stands may be found on slightly elevated or drier ground adjacent to salt or alkaline marshes, tidal flats, levees, and road margins.

Local Environmental Description

Elevation: Mean 4 m, Range 0 – 11 m

Aspect: Flat (4), NW (1), SE (1)

Slope: Mean 1 degrees, Range 0 – 4 degrees

Macro Topography: Bottom (5), Lower 1/3 of slope (1)

Large Rock: Mean 0.2%, Range 0.0 – 1.0%

Small Rock: Mean 0.7%, Range 0.0 – 4.0%

Fines Cover: Mean 45.8%, Range 2.0 – 77.0%

Litter Cover: Mean 48.0%, Range 20.0 – 93%

Soil Texture (field assessed): Muck (4), Fine clay (1), Moderately fine clay loam (1)

Geology (field or map data): Clayey alluvium (2), Mixed alluvium (2), Silty alluvium (1)

San Mateo County Watersheds: Pescadero Creek (2), San Mateo Bayside (2), Palo Alto (1), San Gregorio Creek (1)

Site Impacts

This alliance has low non-native plant cover (average 11.6%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Atriplex prostrata*, *Beta vulgaris*, and *Polypogon monspeliensis*.

Associations in San Mateo County

- *Grindelia stricta*

Classification Comments

None.

References: Klein et al. 2015

Global Rarity Rank: G2G3

State Rarity Rank: S2S3

Surveys Used for Description

Grindelia (stricta) Provisional Herbaceous Alliance

Total: N=6; San Mateo County (n=6): SMAT0126, SMAT0222, SMAT0267,
 SMAT0311, SMATREL0136, SMATREL0191

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min= Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Grindelia stricta</i>	100.0	52.7	39.7	25	60	Y	Y		Y
	<i>Sarcocornia pacifica</i>	66.7	16.5	11.7	0.2	30				Y
	<i>Jaumea carnosa</i>	66.7	4.4	3.5	1	15				Y
	<i>Distichlis spicata</i>	66.7	3.8	2.7	0.2	10				Y
	<i>Potentilla anserina</i>	50.0	0.6	0.4	0.2	2				Y
	<i>Polypogon monspeliensis</i>	33.3	6.2	5.0	0.2	30				
	<i>Cuscuta salina</i>	33.3	1.6	1.2	0.2	7				
	<i>Atriplex prostrata</i>	33.3	0.7	0.5	1	2				
	<i>Beta vulgaris</i>	33.3	0.1	0.1	0.2	0.2				

***Grindelia stricta* Provisional Association**

Common Name: Gumweed Patches

Alliance: *Grindelia (stricta)* Provisional Herbaceous Alliance

Classification Comments

The association circumscription is the same as that of the alliance. See above for detailed description.

References: Klein et al. 2015

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Grindelia stricta</i>	100.0	52.7	39.7	25	60		Y		Y
	<i>Sarcocornia pacifica</i>	66.7	16.5	11.7	0.2	30				Y
	<i>Jaumea carnosa</i>	66.7	4.4	3.5	1	15				Y
	<i>Distichlis spicata</i>	66.7	3.8	2.7	0.2	10				Y
	<i>Potentilla anserina</i>	50.0	0.6	0.4	0.2	2				Y
	<i>Polypogon monspeliensis</i>	33.3	6.2	5.0	0.2	30				
	<i>Cuscuta salina</i>	33.3	1.6	1.2	0.2	7				
	<i>Atriplex prostrata</i>	33.3	0.7	0.5	1	2				
	<i>Avena spp.</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Beta vulgaris</i>	33.3	0.1	0.1	0.2	0.2				

***Holcus lanatus* – *Anthoxanthum odoratum* Herbaceous Semi-Natural Alliance**



Common Name: Common velvet grass – sweet vernal grass meadows

NVC Alliance Code: A2063. *Anthoxanthum odoratum* - *Holcus lanatus* Ruderal Coastal Grassland Alliance

Statewide Description

Anthoxanthum odoratum and/or *Holcus lanatus* dominate or co-dominate in the herbaceous layer with *Anagallis arvensis*, *Anthoxanthum odoratum*, *Briza maxima*, *Cirsium vulgare*, *Hypochaeris radicata*, *Plantago lanceolata*, *Rumex acetosella*, and *Vulpia bromoides*.

Stands of *Holcus lanatus* – *Anthoxanthum odoratum* are similar to those of *Agrostis stolonifera* – *Festuca arundinacea*; however, the latter species occur in wetter and more brackish sites of managed wetlands (Pickart 2006). Both *H. lanatus* and *A. odoratum* occur along coastal terraces and moist pastures in central and northern California. Both plants particularly invade stands of the *Calamagrostis nutkaensis*, *Carex obnupta*, *Danthonia californica*, *Deschampsia cespitosa*, and *Hordeum brachyantherum* Alliances (CNPS 2005, Ford and Hayes 2007, Heady et al. 1977, Keeler-Wolf et al. 2003a).

Holcus lanatus is a recent invader, now dominating many coastal prairies of California. It has a high capacity for rapid vegetative growth in open areas, but it has a disadvantage against taller natives that create shaded conditions (Grime 1979).

Holcus lanatus – *Anthoxanthum odoratum* Herbaceous Semi-Natural Alliance

Local Vegetation Description

The Common velvet grass – sweet vernal grass meadows Alliance forms an intermittent to continuous herbaceous layer. The shrub layer is open and the tree layer is sparse. Dominant herbs include *Holcus lanatus*. Those herbs often present include *Cirsium vulgare*, *Lolium perenne*, and *Rumex acetosella*, and herbs that are sometimes present include *Achillea millefolium*, *Anagallis arvensis*, *Bromus hordeaceus*, *Carex* spp., *Conium maculatum*, *Cynosurus echinatus*, *Geranium dissectum*, *Hordeum brachyantherum*, *Hypochaeris radicata*, *Iris douglasiana*, *Juncus patens*, *Juncus phaeocephalus*, *Plantago lanceolata*, *Silene gallica*, *Silybum marianum*, *Sisyrinchium bellum*, *Stachys ajugoides*, *Vicia sativa*, and *Vulpia bromoides*. Commonly associated emergent shrubs include *Baccharis pilularis*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.3	0 – 5	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0.0 – 0.0	no data	no data
Shrub	2.0	0.0 – 12.0	0.8	0 – 2
Herb	88.4	40 – 100	0.6	0 – 2

Local Membership Rule

Holcus lanatus and/or *Anthoxanthum odoratum* dominate individually or in combination. Other co- dominants may include *Briza maxima*, *Lolium perenne*, *Plantago lanceolata*, *Rumex acetosella*, and *Vulpia bromoides*.

Local Environmental Description

Elevation: Mean 72 m, Range 11 – 401 m

Aspect: SW (4), Flat (2), SE (2), NW (1)

Slope: Mean 3 degrees, Range 0 – 8 degrees

Macro Topography: Upper 1/3 of slope (5), Bottom (1), Lower 1/3 of slope (1), Middle 1/3 of slope (1)

Large Rock: Mean 0.0%, Range 0.0 – 0.4%

Small Rock: Mean 0.3%, Range 0.0 – 1.0%

Fines Cover: Mean 11.0%, Range 0.0 – 60.0%

Litter Cover: Mean 74.0%, Range 34.0 – 91%

Soil Texture (field assessed): Medium to very fine, sandy loam (4), Coarse, loamy sand (1), Medium loam (1), Medium to very fine, loamy sand (1), Moderately coarse, sandy loam (1)

Geology (field or map data): Sandstone and other sedimentary (12), Granitic (4), Franciscan melange (3), Alluvium (1), Siltstone (1)

San Mateo County Watersheds: San Mateo Bayside (1)

Other Watersheds, Marin Co.: Point Reyes (13), Bolinas (4), Inverness (2), San Rafael (1)

Site Impacts

This alliance has greater cover of exotics than natives, non-native plant cover (average 89.7%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Bromus hordeaceus*, *Cirsium vulgare*, *Conium maculatum*, *Cynosurus echinatus*, *Geranium dissectum*, *Holcus lanatus*, *Hypochaeris radicata*, *Plantago lanceolata*, *Rumex acetosella*, *Silene gallica*, *Silybum marianum*, *Vicia sativa*, and *Vulpia bromoides*.

Associations in San Mateo County

- *Holcus lanatus*

Classification Comments

None.

References: Buck-Diaz et al. 2020, Keeler-Wolf et al. 2003a, Klein et al. 2015, Pickart 2006

Global Rarity Rank: GNA **State Rarity Rank:** SNA

Surveys Used for Description

Total: N=24; San Mateo County (n=1): PWFWM01A

Marin County (n=23): HEAD0073, HEAD0076, HEAD0268, HEAD0269, HEAD0312, HEAD0318, HEAD0325, PGA129, PGA1406, PGA1497, PGA210, PGA214, PGA236, PGA520, PGA529, PGA7599, PGA7599A, PGA87, PGA90, PGA96, PGA96A, PORE051, TEVA017c

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub										
	<i>Baccharis pilularis</i>	37.5	29.2	1.0	0.1	7				
Herb										
	<i>Holcus lanatus</i>	100.0	61.0	65.1	18	99	Y	Y		Y
	<i>Cirsium vulgare</i>	58.3	1.0	1.0	0.1	8				Y
	<i>Lolium perenne</i>	54.2	7.1	9.0	0.2	40				Y
	<i>Rumex acetosella</i>	50.0	2.1	2.9	0.2	18				Y
	<i>Plantago lanceolata</i>	37.5	3.1	5.2	0.2	68				
	<i>Achillea millefolium</i>	37.5	0.9	1.1	0.1	15				
	<i>Geranium dissectum</i>	37.5	0.1	0.1	0.2	0.2				
	<i>Hypochaeris radicata</i>	33.3	0.9	0.8	0.2	8				
	<i>Cynosurus echinatus</i>	29.2	1.6	1.9	0.2	20				
	<i>Vicia sativa</i>	29.2	0.3	0.5	0.2	8				
	<i>Vulpia bromoides</i>	25.0	4.9	7.4	8	68				

<i>Conium maculatum</i>	25.0	1.7	1.6	1	20
<i>Hordeum</i>					
<i>brachyantherum</i>	25.0	0.4	0.4	0.1	7
<i>Anagallis arvensis</i>	25.0	0.3	0.4	0.2	8
<i>Iris douglasiana</i>	25.0	0.3	0.3	0.2	3
<i>Juncus phaeocephalus</i>	25.0	0.3	0.3	0.2	3
<i>Carex spp.</i>	20.8	0.6	0.5	0.2	12
<i>Silybum marianum</i>	20.8	0.3	0.4	0.2	3
<i>Bromus hordeaceus</i>	20.8	0.2	0.4	0.2	8
<i>Stachys ajugoides</i>	20.8	0.3	0.3	0.2	3
<i>Juncus patens</i>	20.8	0.2	0.3	0.2	3
<i>Sisyrinchium bellum</i>	20.8	0.1	0.2	0.1	3
<i>Silene gallica</i>	20.8	0.0	0.0	0.2	0.2

***Holcus lanatus* Semi-natural Association**

Common Name: Common velvet grass Patches

Alliance: *Holcus lanatus* – *Anthoxanthum odoratum* Herbaceous Semi-Natural Alliance

Local Vegetation Description

The Common velvet grass Association forms a continuous herbaceous layer in the single sample available. The shrub layer is absent and the tree layer is absent. Dominant herbs include *Holcus lanatus*. Those herbs often present include *Cirsium vulgare*, *Lolium perenne*, and *Rumex acetosella*, and herbs that are sometimes present include *Achillea millefolium*, *Anagallis arvensis*, *Bromus hordeaceus*, *Carex* spp., *Conium maculatum*, *Cynosurus echinatus*, *Geranium dissectum*, *Hordeum brachyantherum*, *Hypochaeris radicata*, *Iris douglasiana*, *Juncus patens*, *Juncus phaeocephalus*, *Plantago lanceolata*, *Silene gallica*, *Silybum marianum*, *Sisyrinchium bellum*, *Stachys ajugoides*, *Vicia sativa*, and *Vulpia bromoides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0.0 – 0.0	no data	no data
Shrub	2.3	0.0 – 10.0	0.8	0 – 2
Herb	78.8	50 – 98	0.6	0 – 2

Local Environmental Description

Elevation: 142 m

Aspect: Flat (1)

Slope: 0 degrees

Macro Topography:

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: 0.0%

Litter Cover: 70%

Soil Texture (field assessed): no data

Geology (field or map data): Franciscan melange (1)

San Mateo County Watersheds: San Mateo Bayside (1)

Site Impacts

This association has greater cover of non-native (average 83.7%) than native. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Bromus hordeaceus*, *Cirsium vulgare*, *Conium maculatum*, *Cynosurus echinatus*, *Geranium dissectum*, *Holcus lanatus*, *Hypochaeris radicata*, *Lolium*

Holcus lanatus Semi-natural Association
Holcus lanatus – *Anthoxanthum odoratum* Herbaceous Semi-Natural Alliance

perenne, *Plantago lanceolata*, *Rumex acetosella*, *Silene gallica*, *Silybum marianum*, *Vicia sativa*, and *Vulpia bromoides*.

Classification Comments

None.

References: Klein et al. 2015, Pickart 2006

Global Rarity Rank: GNA

State Rarity Rank: SNA

State Rare: N

Surveys Used for Description

Total: N=1; San Mateo County (n=1): PWFWM01A

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Holcus lanatus</i>	100.0	80.1	87.5	87.5	87.5		Y		Y
	<i>Carex harfordii</i>	100.0	9.1	10.0	10	10				Y
	<i>Stachys ajugoides</i>	100.0	2.7	3.0	3	3				Y
	<i>Juncus lescurii</i>	100.0	2.7	3.0	3	3				Y
	<i>Rumex conglomeratus</i>	100.0	2.7	3.0	3	3				Y
	<i>Geranium dissectum</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Mimulus guttatus</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Lotus corniculatus</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Sonchus asper</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Trifolium wormskioldii</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Picris echioides</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Hordeum brachyantherum</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Euthamia occidentalis</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Epilobium ciliatum</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Carex tumulicola</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Avena spp.</i>	100.0	0.2	0.2	0.2	0.2				Y

***Juncus (effusus, patens) – Carex (pansa, praegracilis)*
Herbaceous Alliance**



Common Name: Soft and western rush – sedge marshes

NVC Alliance Code: A3822. *Carex obnupta* Wet Meadow Alliance

Statewide Description

Juncus effusus, *J. patens*, *Carex pansa*, *C. praegracilis*, or *C. serratodens* dominate in the herbaceous layer with *Achillea millefolium*, *Argentina egedii*, *Artemisia pycnocephala*, *Briza maxima*, *Bromus tectorum*, *Camissonia cheiranthifolia*, *Cardionema ramosissimum*, *Carex* spp., *Carpobrotus chilensis*, *Cirsium vulgare*, *Epilobium ciliatum*, *Erigeron glaucus*, *Helminthotheca echioides*, *Holcus lanatus*, *Juncus arcticus*, *Juncus bufonius*, *Juncus lescurii*, *Juncus phaeocephalus*, *Lactuca serriola*, *Lolium perenne*, *Lotus* spp., *Luzula comosa*, *Plantago* spp., *Poa douglasii*, *Pteridium aquilinum*, *Senecio minimus*, *Trifolium* spp., *Typha latifolia*, and *Urtica dioica*. Emergent shrubs may be present at low cover, including *Baccharis pilularis*, *Lotus scoparius*, or *Rubus armeniacus*.

Several *Juncus* species overlap ecologically in moist coastal terraces, seeps, and pond edges along the northern and central coast of California. *Juncus effusus* and *J. patens* overlap geographically and tend to be the most common stand formers, perhaps due to their tolerance of relatively heavy cattle browsing.

However, *Juncus phaeocephalus*, *J. occidentalis*, and other *Juncus* species may also occur in similar settings.

Stands of various *Juncus* spp. and *Carex* spp. occur scattered across California in wetland flats and depressions. Ecological relationships with other caespitose to somewhat rhizomatous rushes and sedges along the coast appear close, therefore the species which were previously treated in separate alliances have been combined along with other rushes and sedges.

Local Vegetation Description

The Soft and western rush – sedge marshes Alliance forms an intermittent to continuous herbaceous layer. The shrub layer is open and the tree layer is absent. Those herbs often present include *Carex subbracteata*, *Cirsium vulgare*, *Holcus lanatus*, *Juncus effusus*, *Juncus patens*, and *Picris echioides*, and herbs that are sometimes present include *Aira caryophylla*, *Anagallis arvensis*, *Avena* spp., *Briza minor*, *Bromus hordeaceus*, *Centaurium muehlenbergii*, *Conium maculatum*, *Cyperus eragrostis*, *Eleocharis macrostachya*, *Elymus triticoides*, *Epilobium ciliatum*, *Geranium dissectum*, *Hypochaeris radicata*, *Iris douglasiana*, *Juncus arcticus*, *Juncus bufonius*, *Juncus phaeocephalus*, *Linum bienne*, *Lolium perenne*, *Lotus corniculatus*, *Lythrum hyssopifolium*, *Mentha pulegium*, *Myosotis discolor*, *Parentucellia viscosa*, *Phalaris aquatica*, *Potentilla anserina*, *Rumex acetosella*, *Rumex crispus*, *Rumex salicifolius*, *Sonchus asper*, *Symphytotrichum chilense*, *Trifolium angustifolium*, *Vicia sativa*, and *Vicia tetrasperma*. Commonly associated emergent shrubs include *Baccharis pilularis* and *Rubus ursinus*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0.0 – 0.0	no data	no data
Shrub	2.3	0.0 – 10.0	0.8	0 – 2
Herb	78.8	50 – 98	0.6	0 – 2

Local Membership Rule

Carex amplifolia, *C. densa*, *C. pansa*, *C. praegracilis*, *C. serratodens*, *C. tumulicola*, *Juncus effusus*, *J. patens*, *J. covillei*, *J. hesperius*, *J. occidentalis*, *J. phaeocephalus*, and/or *J. subbracteata* dominate individually or in combination near the coast or farther inland. Co-dominant species may include *Holcus lanatus*, *Hypochaeris radicata*, *Juncus bufonius*, *Lolium perenne*, and *Vulpia bromoides*.

Local Environmental Description

Elevation: Mean 44 m, Range 7 – 112 m

Aspect: Flat (4), NW (2), SW (1)

Slope: Mean 2 degrees, Range 0 – 8 degrees

Macro Topography: Bottom (3), Lower 1/3 of slope (2), Bottom to Lower 1/3 of slope (2)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 16.0%, Range 0.0 – 61.3%

Litter Cover: Mean 77.8%, Range 38.7 – 97%

Soil Texture (field assessed): Moderately fine clay loam (2), Muck (2), Medium silt loam (1), Fine sandy clay (1), Moderately fine silty clay loam (1)

Geology (field or map data): Sandstone (2), Sandstone and other sedimentary (2), Alluvium (1), Sedimentary (type unknown) (1), Serpentine (1), Silty alluvium (1), Sand dunes (1)

San Mateo County Watersheds: Ano Nuevo (3), Pescadero Creek (2), Pacifica (1), San Francisco Coastal (1), San Mateo Bayside (1), Tunitas Creek (1)

Site Impacts

This alliance has moderate non-native plant cover (average 24.0%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira caryophylla*, *Anagallis arvensis*, *Briza minor*, *Bromus hordeaceus*, *Cirsium vulgare*, *Conium maculatum*, *Geranium dissectum*, *Holcus lanatus*, *Hypochaeris radicata*, *Linum bienne*, *Lotus corniculatus*, *Lythrum hyssopifolium*, *Mentha pulegium*, *Myosotis discolor*, *Parentucellia viscosa*, *Phalaris aquatica*, *Picris echioides*, *Rumex acetosella*, *Rumex crispus*, *Sonchus asper*, *Trifolium angustifolium*, *Vicia sativa*, and *Vicia tetrasperma*.

Associations in San Mateo County

- *Carex serratodens*
- *Juncus effusus*
- *Juncus phaeocephalus*

Classification Comments

Note that *Juncus hesperius* is more common on the coast than *J. effusus* (E. Wrubel, pers. comm. 2021), and the misidentification of *J. hesperius* as *J. effusus* may have occurred in these surveys.

References: Buck-Diaz et al. 2012, Buck-Diaz et al. 2020, Evens and Kentner 2006, Evens and San 2005, Keeler-Wolf et al. 2003a, Klein et al. 2007, Klein et al. 2015, Moran 2004a, McBride and Stone 1976, Rodriguez et al. 2017

Global Rarity Rank: G4?

State Rarity Rank: S4?

Surveys Used for Description

Total: N=9; San Mateo County (n=9): PGA1766, SMAT0098, SMAT0109, SMAT0167, SMAT0210, SMAT0294, SMATREL0107, SMATREL0115, TOKA129A

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
-------	-------	-----	-----	-----	-----	-----	----	---	----	-----

Juncus (effusus, patens) – Carex (pansa, praegracilis) Herbaceous Alliance

Shrub

<i>Rubus ursinus</i>	55.6	39.3	1.7	1	5	Y
<i>Baccharis pilularis</i>	55.6	27.6	1.0	0.2	5	Y
<i>Toxicodendron diversilobum</i>	33.3	4.1	0.4	0.2	3	

Herb

<i>Holcus lanatus</i>	66.7	4.6	4.1	0.2	16.498	Y
<i>Juncus patens</i>	66.7	3.5	2.0	0.2	5	Y
<i>Juncus effusus</i>	55.6	20.8	17.5	7	74	Y
<i>Picris echioides</i>	55.6	5.6	5.1	0.3367	35	Y
<i>Carex subbracteata</i>	55.6	4.6	3.0	0.2	20	Y
<i>Cirsium vulgare</i>	55.6	0.2	0.2	0.2	0.6734	Y
<i>Juncus phaeocephalus</i>	44.4	19.3	14.1	0.2	67	
<i>Potentilla anserina</i>	44.4	2.2	2.0	0.2	15	
<i>Conium maculatum</i>	44.4	1.0	1.0	0.11	5	
<i>Lotus corniculatus</i>	44.4	0.8	0.7	0.2	3	
<i>Juncus bufonius</i>	44.4	0.3	0.2	0.11	1	
<i>Rumex crispus</i>	44.4	0.3	0.2	0.2	1	
<i>Sonchus asper</i>	44.4	0.2	0.1	0.2	0.3367	
<i>Geranium dissectum</i>	33.3	0.7	0.6	0.2	3.367	
<i>Vicia tetrasperma</i>	33.3	0.6	0.6	1	2.0202	
<i>Myosotis discolor</i>	33.3	0.5	0.4	0.2	3	
<i>Briza minor</i>	33.3	0.5	0.4	0.2	3	
<i>Lythrum hyssopifolium</i>	33.3	0.5	0.4	0.2	3	
<i>Mentha pulegium</i>	33.3	0.3	0.3	0.11	2	
<i>Vicia sativa</i>	33.3	0.4	0.2	0.2	1	
<i>Cyperus eragrostis</i>	33.3	0.2	0.1	0.11	1	
<i>Centaurium muehlenbergii</i>	33.3	0.1	0.1	0.2	0.2	
<i>Rumex salicifolius</i>	33.3	0.1	0.1	0.2	0.2	
<i>Epilobium ciliatum</i>	33.3	0.1	0.1	0.2	0.2	
<i>Elymus triticoides</i>	22.2	2.6	2.4	10	12	
<i>Lolium perenne</i>	22.2	2.3	1.9	2.3569	15	
<i>Phalaris aquatica</i>	22.2	1.9	1.9	0.2	16.498	
<i>Eleocharis macrostachya</i>	22.2	2.3	0.7	0.2	6	
<i>unknown Poaceae</i>	22.2	0.8	0.5	1	3.7037	
<i>Linum bienne</i>	22.2	0.4	0.3	1.0101	2	
<i>Juncus arcticus</i>	22.2	0.6	0.3	1	2	
<i>Parentucellia viscosa</i>	22.2	0.3	0.2	0.2	2	
<i>Symphotrichum chilense</i>	22.2	0.8	0.2	0.2	2	
<i>Aira caryophyllea</i>	22.2	0.2	0.2	0.2	1.3468	
<i>Bromus hordeaceus</i>	22.2	0.2	0.2	0.2	1.3468	
<i>Hypochaeris radicata</i>	22.2	0.2	0.2	0.2	1.3468	
<i>Rumex acetosella</i>	22.2	0.2	0.1	0.2	1	
<i>Trifolium angustifolium</i>	22.2	0.2	0.1	0.2	1	

Juncus (effusus, patens) – Carex (pansa, praegracilis) Herbaceous Alliance

	<i>Anagallis arvensis</i>	22.2	0.1	0.1	0.2	0.6734
	<i>Iris douglasiana</i>	22.2	0.1	0.1	0.2	0.6734
	<i>Avena spp.</i>	22.2	0.1	0.1	0.2	0.4
Non-Vascular						
	Moss	22.2	22.2	0.1	0.2	1.0101

Carex serratodens Provisional Association

Common Name: Twotooth Sedge Patches

Alliance: *Juncus (effusus, patens)* – *Carex (pansa, praegracilis)* Herbaceous Alliance

Local Vegetation Description

The Twotooth Sedge Association forms an intermittent to continuous herbaceous layer. The shrub layer is open and the tree layer is absent. Dominant herbs include *Carex serratodens*, and characteristic herbs include *Mimulus guttatus*. Those herbs often present include *Anagallis arvensis* and *Lactuca saligna*, and herbs that are sometimes present include *Avena* spp., *Cirsium fontinale*, *Elymus triticoides*, *Hemizonia congesta*, *Hordeum brachyantherum*, *Juncus arcticus*, *Juncus occidentalis*, *Lolium perenne*, *Lotus wrangelianus*, *Nassella pulchra*, *Trifolium fucatum*, and *Trifolium variegatum*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	2.1	0.0 – 5.2	0.8	0.5 – 1
Herb	75.2	40 – 87	1.2	0 – 2

Local Environmental Description

Elevation: Mean 318 m, Range 112 – 586 m

Aspect: SE (3), SW (2)

Slope: Mean 11 degrees, Range 5 – 20 degrees

Macro Topography: Middle to Upper 1/3 of slope (1), Upper 1/3 of slope (1), Draw (1), Bottom to Lower 1/3 of slope (1), Middle 1/3 of slope (1)

Large Rock: Mean 1.3%, Range 0.0 – 6.0%

Small Rock: Mean 10.8%, Range 0.0 – 45.0%

Fines Cover: Mean 12.4%, Range 0.0 – 28.0%

Litter Cover: Mean 42.4%, Range 2.0 – 97%

Soil Texture (field assessed): Medium silt (1), Moderately fine clay loam (1), Medium loam (1), Coarse, loamy sand (1), Muck (1)

Geology (field or map data): Franciscan melange (3), Serpentine (2)

San Mateo County Watersheds: San Mateo Bayside (1)

Other Watersheds, Marin Co.: Lagunitas Creek (3); **Santa Clara Co.:** Coyote Creek (1)

Site Impacts

This association has moderate non-native plant cover (average 20.5%) relative to native cover. Non- native species that occur with highest frequency and abundance include

Carex serratodens Provisional Association
Juncus (effusus, patens) – *Carex (pansa, praegracilis)* Herbaceous Alliance

Anagallis arvensis, *Avena* spp., *Lactuca saligna*, and *Lolium perenne*.

Classification Comments

This association is considered provisional since it is under-sampled in its expected range. Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Klein et al. 2007, Klein et al. 2015

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=5; San Mateo County (n=1): SMAT0294

Marin County (n=3): MARIN087, MARIN250, MMWD0044

Santa Clara County (n=1): COYO088

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	40.0	24.8	0.2	0.2	1				
	<i>Frangula californica</i>	40.0	21.5	0.2	0.2	1				
	<i>Toxicodendron diversilobum</i>	40.0	17.6	0.2	0.2	1				
Herb	<i>Carex serratodens</i>	100.0	41.5	33.4	5	60			Y	Y
	<i>Mimulus guttatus</i>	80.0	0.4	0.3	0.1	1				Y
	<i>Lactuca saligna</i>	60.0	0.2	0.1	0.1	0.2				Y
	<i>Anagallis arvensis</i>	60.0	0.1	0.1	0.2	0.2				Y
	<i>Lolium perenne</i>	40.0	18.9	10.2	15	36				
	<i>Juncus occidentalis</i>	40.0	9.6	8.0	0.2	40				
	<i>Cirsium fontinale</i>	40.0	7.9	5.6	3	25				
	<i>Elymus triticoides</i>	40.0	2.9	2.4	0.1	12				
	<i>Hemizonia congesta</i>	40.0	2.4	2.0	0.1	10				
	<i>Nassella pulchra</i>	40.0	0.5	0.4	0.1	2				
	<i>Juncus arcticus</i>	40.0	0.5	0.4	1	1				
	<i>Avena</i> spp.	40.0	0.1	0.1	0.1	0.2				
	<i>Hordeum brachyantherum</i>	40.0	0.1	0.1	0.1	0.2				
	<i>Trifolium variegatum</i>	40.0	0.1	0.1	0.2	0.2				
	<i>Lotus wrangelianus</i>	40.0	0.1	0.1	0.2	0.2				
<i>Trifolium fucatum</i>	40.0	0.1	0.1	0.2	0.2					

Carex serratodens Provisional Association
Juncus (effusus, patens) – Carex (pansa, praegracilis) Herbaceous Alliance

***Juncus effusus* Association**

Common Name: Soft rush Patches

Alliance: *Juncus (effusus, patens) – Carex (pansa, praegracilis)* Herbaceous Alliance

Local Vegetation Description

The Soft rush Association forms a continuous herbaceous layer. The shrub layer is sparse and the tree layer is absent. Dominant herbs include *Juncus effusus*. Those herbs often present include *Holcus lanatus* and *Potentilla anserina*, and herbs that are sometimes present include *Carex obnupta*, *Cirsium vulgare*, *Juncus arcticus*, *Juncus patens*, *Juncus phaeocephalus*, *Mimulus guttatus*, *Oenanche sarmentosa*, and *Rumex crispus*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.5	0.0 – 1.0	0.8	0.5 – 1
Herb	96.0	94 – 98	0.8	0.5 – 1

Local Environmental Description

Elevation: Mean 11 m, Range 7 – 15 m

Aspect: Flat (1)

Slope: 0 degrees

Macro Topography: Bottom (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: 0.0%

Litter Cover: 96%

Soil Texture (field assessed): Moderately fine clay loam (1)

Geology (field or map data): Alluvium (1), Sandstone (1)

San Mateo County Watersheds: Pacifica (1), San Francisco Coastal (1)

Site Impacts

This association has moderate non-native plant cover (average 23.7%) relative to native cover. Non- native species that occur with highest frequency and abundance include *Cirsium vulgare*, *Holcus lanatus*, and *Rumex crispus*.

Classification Comments

Note that *Juncus hesperius* is more common on the coast than *J. effusus* (E. Wrubel,

pers. comm. 2021), and the misidentification of *J. hesperius* as *J. effusus* may have occurred in these surveys.

References: Buck-Diaz et al. 2012, Buck-Diaz et al. 2020, Evens and Kentner 2006, Evens and San 2005, Keeler-Wolf et al. 2003a, Klein et al. 2007, Klein et al. 2015, Moran 2004a

Global Rarity Rank: G4 **State Rarity Rank:** S4? **State Rare:** N

Surveys Used for Description

Total: N=2; San Mateo County (n=2): PGA1766, SMATREL0115

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Rubus ursinus</i>	50.0	37.5	1.5	1	5				Y
	<i>Baccharis pilularis</i>	50.0	30.0	0.8	1	2				Y
	<i>Toxicodendron diversilobum</i>	25.0	7.5	0.8	3	3				
Herb	<i>Juncus effusus</i>	100.0	39.4	34.4	7	74			Y	Y
	<i>Picris echioides</i>	100.0	12.2	11.3	0.3367	35				Y
	<i>Juncus patens</i>	75.0	6.7	3.5	4.0404	5				Y
	<i>Holcus lanatus</i>	75.0	4.5	4.2	0.2	16.498				Y
	<i>Carex subbracteata</i>	75.0	3.0	1.7	0.6734	4				Y
	<i>Conium maculatum</i>	75.0	2.2	2.1	0.11	5				Y
	<i>Cyperus eragrostis</i>	75.0	0.4	0.3	0.11	1				Y
	<i>Cirsium vulgare</i>	75.0	0.4	0.3	0.2	0.6734				Y
	<i>Rumex crispus</i>	75.0	0.3	0.2	0.2	0.2				Y
	<i>Phalaris aquatica</i>	50.0	4.3	4.2	0.2	16.498				Y
	<i>Potentilla anserina</i>	50.0	3.8	4.0	1	15				Y
	unknown Poaceae	50.0	1.8	1.2	1	3.7037				Y
	<i>Symphyotrichum chilense</i>	50.0	1.8	0.6	0.2	2				Y
	<i>Geranium dissectum</i>	50.0	1.0	0.9	0.2	3.367				Y
	<i>Vicia sativa</i>	50.0	0.9	0.3	0.2	1				Y
	<i>Lotus corniculatus</i>	50.0	0.9	0.7	0.2	2.6936				Y
	<i>Myosotis discolor</i>	50.0	0.3	0.1	0.2	0.3367				Y
<i>Sonchus asper</i>	50.0	0.3	0.1	0.2	0.3367				Y	
<i>Epilobium ciliatum</i>	50.0	0.2	0.1	0.2	0.2				Y	

Juncus effusus Association
Juncus (effusus, patens) – Carex (pansa, praeegracilis) Herbaceous Alliance

<i>Juncus bufonius</i>	50.0	0.2	0.1	0.11	0.3367	Y
<i>Eleocharis macrostachya</i>	25.0	5.1	1.5	6	6	
<i>Elymus triticoides</i>	25.0	2.4	2.5	10	10	
<i>Dactylis glomerata</i>	25.0	1.9	1.9	7.4074	7.4074	
<i>Vulpia bromoides</i>	25.0	0.8	0.8	3.0303	3.0303	
<i>Lolium perenne</i>	25.0	0.6	0.6	2.3569	2.3569	
<i>Vicia tetrasperma</i>	25.0	0.5	0.5	2.0202	2.0202	
<i>Hypochaeris radicata</i>	25.0	0.3	0.3	1.3468	1.3468	
<i>Aira caryophyllea</i>	25.0	0.3	0.3	1.3468	1.3468	
<i>Festuca arundinacea</i>	25.0	0.3	0.3	1.3468	1.3468	
<i>Bromus hordeaceus</i>	25.0	0.3	0.3	1.3468	1.3468	
<i>Linum bienne</i>	25.0	0.3	0.3	1.0101	1.0101	
<i>Anagallis arvensis</i>	25.0	0.2	0.2	0.6734	0.6734	
<i>Iris douglasiana</i>	25.0	0.2	0.2	0.6734	0.6734	
<i>Bromus catharticus</i>	25.0	0.2	0.2	0.6734	0.6734	
<i>Polygonum spp.</i>	25.0	0.2	0.1	0.2	0.2	
<i>Juncus phaeocephalus</i>	25.0	0.2	0.1	0.2	0.2	
<i>Rumex spp.</i>	25.0	0.2	0.1	0.2	0.2	
<i>Rumex salicifolius</i>	25.0	0.2	0.1	0.2	0.2	
<i>Lythrum hyssopifolium</i>	25.0	0.2	0.1	0.2	0.2	
<i>Avena spp.</i>	25.0	0.1	0.1	0.4	0.4	
<i>Trifolium spp.</i>	25.0	0.1	0.0	0.11	0.11	
<i>Mentha pulegium</i>	25.0	0.1	0.0	0.11	0.11	
<i>Poa pratensis</i>	25.0	0.1	0.1	0.3367	0.3367	
<i>Hordeum brachyantherum</i>	25.0	0.1	0.1	0.3367	0.3367	
<i>Vicia villosa</i>	25.0	0.1	0.1	0.2	0.2	
<i>Trifolium angustifolium</i>	25.0	0.1	0.1	0.2	0.2	
<i>Scirpus microcarpus</i>	25.0	0.1	0.1	0.2	0.2	
<i>Rumex acetosella</i>	25.0	0.1	0.1	0.2	0.2	
<i>Sisyrinchium bellum</i>	25.0	0.1	0.1	0.2	0.2	
<i>Danthonia californica</i>	25.0	0.1	0.1	0.2	0.2	
<i>Bromus diandrus</i>	25.0	0.1	0.1	0.2	0.2	
<i>Briza minor</i>	25.0	0.1	0.1	0.2	0.2	
<i>Carex subfusca</i>	25.0	0.1	0.1	0.2	0.2	
<i>Equisetum arvense</i>	25.0	0.1	0.1	0.2	0.2	
<i>Hordeum vulgare</i>	25.0	0.1	0.1	0.2	0.2	
<i>Trifolium dubium</i>	25.0	0.1	0.1	0.2	0.2	
<i>Wyethia helenioides</i>	25.0	0.1	0.1	0.2	0.2	
<i>Brassica nigra</i>	25.0	0.0	0.1	0.2	0.2	
Non-Vascular						
Moss	25.0	25.0	0.3	1.0101	1.0101	

Juncus phaeocephalus Association

Common Name: Brown-headed rush Patches

Alliance: *Juncus (effusus, patens) – Carex (pansa, praegracilis)* Herbaceous Alliance

Local Vegetation Description

The Brown-headed rush Association forms an intermittent to continuous herbaceous layer. The shrub layer is sparse and the tree layer is absent. Dominant herbs include *Juncus phaeocephalus*. Those herbs often present include *Briza minor*, *Holcus lanatus*, *Juncus bufonius*, and *Lolium perenne*, and herbs that are sometimes present include *Anagallis arvensis*, *Bromus hordeaceus*, *Carex* spp., *Carex densa*, *Carex obnupta*, *Cirsium vulgare*, *Cynosurus echinatus*, *Danthonia californica*, *Eryngium armatum*, *Geranium dissectum*, *Hypochaeris radicata*, *Iris douglasiana*, *Juncus patens*, *Leontodon taraxacoides*, *Lotus corniculatus*, *Lythrum hyssopifolium*, *Mentha pulegium*, *Plantago lanceolata*, *Potentilla anserina*, *Rumex acetosella*, *Rumex pulcher*, *Trifolium dubium*, *Trifolium wormskoldii*, and *Vulpia bromoides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	1.1	0.0 – 3.0	1.1	0.5 – 2
Herb	74.0	50 – 90	0.4	0 – 1

Local Environmental Description

Elevation: Mean 46 m, Range 7 – 105 m

Aspect: Flat (2), NW (1)

Slope: Mean 1 degrees, Range 0 – 3 degrees

Macro Topography: Bottom (2), Bottom to Lower 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 5.7%, Range 2.0 – 10.0%

Litter Cover: Mean 83.3%, Range 65.0 – 94%

Soil Texture (field assessed): Medium silt loam (1), Moderately fine silty clay loam (1), Muck (1)

Geology (field or map data): Sand dunes (1), Sedimentary (type unknown) (1), Silty alluvium (1)

San Mateo County Watersheds: Ano Nuevo (1), Pescadero Creek (1), Tunitas Creek (1)

Site Impacts

Juncus phaeocephalus Association
Juncus (effusus, patens) – Carex (pansa, praegracilis) Herbaceous Alliance

This association has moderate non-native plant cover (average 26.3%) relative to native cover. Non- native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Briza minor*, *Bromus hordeaceus*, *Cirsium vulgare*, *Cynosurus echinatus*, *Geranium dissectum*, *Holcus lanatus*, *Hypochaeris radicata*, *Leontodon taraxacoides*, *Lolium perenne*, *Lotus corniculatus*, *Lythrum hyssopifolium*, *Mentha pulegium*, *Plantago lanceolata*, *Rumex acetosella*, *Rumex pulcher*, *Trifolium dubium*, and *Vulpia bromoides*.

Classification Comments

None.

References: Buck-Diaz et al. 2020, Klein et al. 2015, Rodriguez et al. 2017

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=3; San Mateo County (n=3): SMAT0167, SMAT0210, SMATREL0107

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Rubus ursinus</i>	33.3	33.3	1.0	3	3				
	<i>Baccharis pilularis</i>	33.3	16.7	0.1	0.2	0.2				
	<i>Salix lasiolepis</i>	33.3	16.7	0.1	0.2	0.2				
Herb	<i>Juncus phaeocephalus</i>	100.0	57.8	42.3	25	67		Y		Y
	<i>Holcus lanatus</i>	66.7	7.6	6.7	5	15				Y
	<i>Juncus patens</i>	66.7	1.6	1.3	1	3				Y
	<i>Lotus corniculatus</i>	66.7	1.4	1.1	0.2	3				Y
	<i>Briza minor</i>	66.7	1.3	1.1	0.2	3				Y
	<i>Lythrum hyssopifolium</i>	66.7	1.3	1.1	0.2	3				Y
	<i>Parentucellia viscosa</i>	66.7	0.9	0.7	0.2	2				Y
	<i>Juncus bufonius</i>	66.7	0.5	0.4	0.2	1				Y
	<i>Centaureum muehlenbergii</i>	66.7	0.2	0.1	0.2	0.2				Y
	<i>Lolium perenne</i>	33.3	6.2	5.0	15	15				
	<i>Distichlis spicata</i>	33.3	5.2	2.7	8	8				
	<i>Carex harfordii</i>	33.3	2.5	2.0	6	6				
	<i>Schoenoplectus pungens</i>	33.3	1.3	0.7	2	2				
	<i>Potentilla anserina</i>	33.3	1.3	0.7	2	2				
	<i>Juncus arcticus</i>	33.3	1.3	0.7	2	2				

Juncus phaeocephalus Association
Juncus (effusus, patens) – Carex (pansa, praegracilis) Herbaceous Alliance

<i>Trifolium campestre</i>	33.3	1.2	1.0	3	3
<i>Myosotis discolor</i>	33.3	1.2	1.0	3	3
<i>Geranium dissectum</i>	33.3	0.8	0.7	2	2
<i>Linum bienne</i>	33.3	0.8	0.7	2	2
<i>Vicia tetrasperma</i>	33.3	0.7	0.7	2	2
<i>Mentha pulegium</i>	33.3	0.7	0.7	2	2
<i>Euthamia occidentalis</i>	33.3	0.7	0.3	1	1
<i>Rumex acetosella</i>	33.3	0.4	0.3	1	1
<i>Trifolium angustifolium</i>	33.3	0.4	0.3	1	1
<i>Rumex crispus</i>	33.3	0.4	0.3	1	1
<i>Picris echioides</i>	33.3	0.4	0.3	1	1
<i>Triphysaria versicolor</i>	33.3	0.1	0.1	0.2	0.2
<i>Plantago coronopus</i>	33.3	0.1	0.1	0.2	0.2
<i>Sonchus asper</i>	33.3	0.1	0.1	0.2	0.2
<i>Trifolium wormskioldii</i>	33.3	0.1	0.1	0.2	0.2
<i>Vicia sativa</i>	33.3	0.1	0.1	0.2	0.2
<i>Forb (herbaceous, not grass nor grasslike)</i>	33.3	0.1	0.1	0.2	0.2
<i>Plantago lanceolata</i>	33.3	0.1	0.1	0.2	0.2
<i>Eleocharis macrostachya</i>	33.3	0.1	0.1	0.2	0.2
<i>Hypochaeris radicata</i>	33.3	0.1	0.1	0.2	0.2
<i>Rumex pulcher</i>	33.3	0.1	0.1	0.2	0.2
<i>Cirsium vulgare</i>	33.3	0.1	0.1	0.2	0.2
<i>Conium maculatum</i>	33.3	0.1	0.1	0.2	0.2
<i>Cynosurus echinatus</i>	33.3	0.1	0.1	0.2	0.2
<i>Rumex salicifolius</i>	33.3	0.1	0.1	0.2	0.2
<i>Aira caryophyllea</i>	33.3	0.1	0.1	0.2	0.2
<i>Polypogon monspeliensis</i>	33.3	0.1	0.1	0.2	0.2
<i>Epilobium ciliatum</i>	33.3	0.1	0.1	0.2	0.2
<i>Deschampsia elongata</i>	33.3	0.1	0.1	0.2	0.2
<i>Carex subbracteata</i>	33.3	0.1	0.1	0.2	0.2
<i>Anagallis arvensis</i>	33.3	0.1	0.1	0.2	0.2
<i>Vulpia myuros</i>	33.3	0.1	0.1	0.2	0.2
<i>Bromus hordeaceus</i>	33.3	0.1	0.1	0.2	0.2

***Lasthenia californica* – *Plantago erecta* – *Vulpia microstachys* Herbaceous Alliance**



Common Name: California goldfields – dwarf plantain – small fescue flower fields

NVC Alliance Code: A4153. *Lasthenia californica* - *Plantago erecta* - *Vulpia microstachys* Meadow Alliance

Statewide Description

Lasthenia californica, *Plantago erecta*, and/or *Vulpia microstachys* are dominant individually or co- dominant in the herbaceous layer with *Achillea millefolium*, *Achnatherum lemmonii*, *Agrostis elliottiana*, *Avena barbata*, *Bromus hordeaceus*, *Calycadenia multiglandulosa*, *Calycadenia truncata*, *Castilleja exserta*, *Chlorogalum pomeridianum*, *Cryptantha flaccida*, *Eriogonum nudum*, *Eschscholzia californica*, *Hemizonia congesta*, *Hesperis matronalis*, *Lasthenia* spp., *Lepidium nitidum*, *Lessingia* spp., *Lolium perenne*, *Lomatium utriculatum*, *Lotus wrangelianus*, *Lupinus nanus*, *Lupinus spectabilis*, *Microseris douglasii*, *Mimulus guttatus*, *Minuartia douglasii*, *Mulla maritima*, *Nassella pulchra*, *Navarretia tagetina*, *Pentagramma triangularis*, *Platystemon californicus*, *Sanicula bipinnatifida*, *Sedella pumila*, *Selaginella hansenii*, *Sidalcea diploscypha*, *Sisyrinchium bellum*, and *Trifolium* spp.

Stands of the *Lasthenia californica* – *Plantago erecta* – *Vulpia microstachys* Alliance occur throughout much of cismontane California (Bartolome et al. 2007a, Evens and San 2004, Hobbs and Mooney 1991, Klein et al. 2007, McCarten 1991, Rodriguez-Rojo et al. 2001a, 2001b, Weiss 1999). This alliance represents a triad of native species that

have a broad adaptation to the area's Mediterranean climate. Bartolome et al. (2007a) suggested that native annual grassland types replace steppe types wherever annual rainfall is less than 21 cm. *Vulpia microstachys* var. *pauciflora* is the most frequent annual grass of these semi-desert grasslands.

This alliance appears to be seasonally abundant on infertile soils of less frequent disturbance, whereas other herbaceous stands with more disturbance-related taxa appear more regularly on deeper and disturbed soils (cf. Hobbs and Mooney 1991, Seabloom et al. 2003, Howard 2006). Adaptation to local site/soil conditions allows these native species to dominate on serpentine soils (Espeland and Rice 2007, Howard 2006, Rajakaruna and Bohm 1999). The three species commonly co-occur, though in some areas only one or two may predominate.

Local Vegetation Description

The California goldfields – dwarf plantain – small fescue flower fields Alliance forms an open to continuous herbaceous layer. The shrub layer is open and the tree layer is sparse or absent. Characteristic herbs include *Lasthenia californica*. Those herbs often present include *Eschscholzia californica*, *Lolium perenne*, and *Plantago erecta*, and herbs that are sometimes present include *Achillea millefolium*, *Avena* spp., *Bromus hordeaceus*, *Calycadenia multiglandulosa*, *Calystegia subacaulis*, *Carduus pycnocephalus*, *Castilleja densiflora*, *Chlorogalum pomeridianum*, *Cirsium quercetorum*, *Clarkia rubicunda*, *Claytonia perfoliata*, *Dichelostemma capitatum*, *Elymus multisetus*, *Eriogonum latifolium*, *Eriogonum nudum*, *Grindelia stricta*, *Hemizonia congesta*, *Hesperevax sparsiflora*, *Leptosiphon parviflorus*, *Lotus wrangelianus*, *Lupinus nanus*, *Nassella pulchra*, *Plantago lanceolata*, *Poa secunda*, *Poa unilateralis*, *Polypodium californicum*, *Rumex acetosella*, *Sidalcea malviflora*, *Trifolium* spp., and *Trifolium willdenovii*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0.2	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	2.3	0 – 8	0.3	0 – 0.5
Herb	53.4	23 – 90	0.3	0 – 0.5

Local Membership Rule

Lasthenia californica, *Calycadenia* spp., *Hemizonia congesta*, *Hesperevax sparsiflora*, *Lomatium*, *Lotus humistratus*, *Micropus californicus*, *Plantago erecta*, and/or *Vulpia microstachys* dominate individually or in combination in the herbaceous layer. *Lasthenia californica*, *Plantago erecta*, and/or *Vulpia microstachys* are often present, sometimes with sparse cover.

Local Environmental Description

Elevation: Mean 209 m, Range 38 – 587 m

Aspect: NE (4), SW (2), NW (1)

Slope: Mean 18 degrees, Range 2 – 35 degrees

Lasthenia californica – *Plantago erecta* – *Vulpia microstachys* Herbaceous Alliance

Macro Topography: Upper 1/3 of slope to Ridgetop (2), Upper 1/3 of slope (2), Middle 1/3 of slope (2), Ridge top (1)

Large Rock: Mean 10.7%, Range 0.0 – 53.0%

Small Rock: Mean 10.1%, Range 0.0 – 32.0%

Fines Cover: Mean 44.3%, Range 13.0 – 81.0%

Litter Cover: Mean 28.7%, Range 1.0 – 60%

Soil Texture (field assessed): Fine sandy clay (1), Medium silt (1), Moderately coarse, sandy loam (1), Moderately fine clay loam (1), Moderately fine sandy clay loam (1), Not recorded (1), Unknown (1)

Geology (field or map data): Serpentine (4), Alluvium (1), Mixed sedimentary (1), Sandstone and other sedimentary (1)

San Mateo County Watersheds: Palo Alto (3), San Mateo Bayside (2), San Francisco Coastal (1), San Gregorio Creek (1)

Site Impacts

This alliance has moderate non-native plant cover (average 36.8%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Bromus hordeaceus*, *Carduus pycnocephalus*, *Plantago lanceolata*, and *Rumex acetosella*.

Associations in San Mateo County

- *Erigeron glaucus* – *Lasthenia californica*
- *Hemizonia congesta* – *Lolium perenne*
- *Lasthenia (californica, gracilis)*
- *Lasthenia californica* – *Plantago erecta* – *Hesperis matronalis*
- *Vulpia microstachys* – *Plantago erecta* – *Calycadenia (truncata, multiglandulosa)*

Classification Comments

None.

References: Buck and Evens 2010, Buck-Diaz and Evens 2011b, Buck-Diaz et al. 2011, Buck-Diaz et al. 2012, Buck-Diaz et al. 2013, Buck-Diaz et al. 2020, Evens and Kentner 2006, Evens and San 2004, Klein et al. 2007, Klein et al. 2015, McCarten 1991, Rodriguez 2015, Rodriguez-Rojo et al. 2001a, Taylor et al. 1992, VegCAMP 2015b

Global Rarity Rank: G4

State Rarity Rank: S4

Surveys Used for Description

Total: N=7; San Mateo County (n=7): SCLAR123, SCLAR145, SMAT0037, SMAT0058, SMAT0071, SMAT0244, SMAT0672

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg =
Lasthenia californica – *Plantago erecta* – *Vulpia microstachys* Herbaceous Alliance

Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	28.6	21.0	1.4	5	5				
	<i>Lupinus versicolor</i>	28.6	14.6	0.1	0.2	0.2				
Herb	<i>Lasthenia californica</i>	85.7	20.0	16.6	1	60	Y			Y
	<i>Lolium perenne</i>	71.4	20.6	8.2	0.2	20				Y
	<i>Plantago erecta</i>	57.1	5.5	1.5	0.2	5				Y
	<i>Eschscholzia californica</i>	57.1	1.6	1.5	0.2	5				Y
	<i>Bromus hordeaceus</i>	42.9	3.2	1.9	1	7				
	<i>Nassella pulchra</i>	42.9	2.8	1.3	2	5				
	<i>Hemizonia congesta</i>	42.9	1.9	0.5	0.2	3				
	<i>Achillea millefolium</i>	42.9	0.5	0.3	0.2	2				
	<i>Chlorogalum pomeridianum</i>	42.9	0.4	0.3	0.2	1				
	<i>Dichelostemma capitatum</i>	42.9	0.2	0.1	0.2	0.2				
	<i>Lotus wrangelianus</i>	42.9	0.2	0.1	0.2	0.2				
	<i>Cirsium quercetorum</i>	42.9	0.1	0.1	0.2	0.2				
	<i>Avena spp.</i>	28.6	3.7	3.6	5	20				
	<i>Calycadenia multiglandulosa</i>	28.6	5.3	2.9	0.2	20				
	<i>Rumex acetosella</i>	28.6	1.7	1.0	2	5				
	<i>Leptosiphon parviflorus</i>	28.6	2.5	0.7	0.2	5				
	<i>Lupinus nanus</i>	28.6	1.8	0.7	2	3				
	<i>Elymus multisetus</i>	28.6	1.5	0.5	0.2	3				
	<i>Grindelia stricta</i>	28.6	0.5	0.4	1	2				
	<i>Trifolium willdenovii</i>	28.6	0.4	0.3	0.2	2				
	<i>Sidalcea malviflora</i>	28.6	0.3	0.3	1	1				
	<i>Eriogonum nudum</i>	28.6	0.6	0.3	1	1				
	<i>Calystegia subacaulis</i>	28.6	0.2	0.2	0.2	1				
	<i>Claytonia perfoliata</i>	28.6	0.2	0.2	0.2	1				
	<i>Poa unilateralis</i>	28.6	0.5	0.2	0.2	1				
	<i>Poa secunda</i>	28.6	0.2	0.2	0.2	1				
	<i>Carduus pycnocephalus</i>	28.6	0.2	0.2	0.2	1				
	<i>Plantago lanceolata</i>	28.6	0.3	0.2	0.2	1				
	<i>Polypodium californicum</i>	28.6	0.1	0.1	0.2	0.2				
	<i>Castilleja densiflora</i>	28.6	0.1	0.1	0.2	0.2				
	<i>Hesperevax sparsiflora</i>	28.6	0.2	0.1	0.2	0.2				
	<i>Eriogonum latifolium</i>	28.6	0.1	0.1	0.2	0.2				
<i>Clarkia rubicunda</i>	28.6	0.1	0.1	0.2	0.2					
<i>Trifolium spp.</i>	28.6	0.1	0.1	0.2	0.2					

Erigeron glaucus – Lasthenia californica Association

Common Name: Seaside Daisy – California Goldfields Patches

Alliance: *Lasthenia californica* – *Plantago erecta* – *Vulpia microstachys* Herbaceous Alliance

Local Vegetation Description

The Seaside Daisy – California Goldfields Association forms a continuous herbaceous layer in the single sample available. The shrub layer is absent and the tree layer is absent. Dominant herbs include *Lasthenia californica*, and characteristic herbs include *Anagallis arvensis*, *Avena* spp., *Bromus hordeaceus*, *Bromus maritimus*, *Calystegia subacaulis*, *Carduus pycnocephalus*, *Cirsium quercetorum*, *Clarkia rubicunda*, *Daucus carota*, *Eriogonum latifolium*, *Erodium cicutarium*, *Eschscholzia californica*, *Geranium dissectum*, *Grindelia stricta*, *Hirschfeldia incana*, *Hordeum brachyantherum*, *Hordeum murinum*, *Hypochaeris radicata*, *Layia platyglossa*, *Lolium perenne*, *Lotus wrangelianus*, *Lupinus nanus*, *Medicago* spp., *Oxalis pes-caprae*, *Plantago coronopus*, *Plantago lanceolata*, *Poa unilateralis*, *Polycarpon tetraphyllum*, *Ranunculus californicus*, *Sidalcea malviflora*, *Sisyrinchium bellum*, *Soliva sessilis*, *Sonchus asper*, *Trifolium* spp., *Trifolium campestre*, and *Trifolium tomentosum*. Commonly associated emergent shrubs at sparse cover include *Lupinus versicolor*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	NA	no data	no data
Hardwood	0.0	NA	no data	no data
Regenerating or Shrubby Tree	0.0	NA	no data	no data
Shrub	0.0	NA	no data	no data
Herb	90.0	NA	0.3	0 – 0.5

Local Environmental Description

Elevation: 38 m

Aspect: NE (1)

Slope: 10 degrees

Macro Topography: Upper 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 5.0%

Fines Cover: 81.0%

Litter Cover: 10%

Soil Texture (field assessed): Moderately coarse, sandy loam (1)

Geology (field or map data): Alluvium (1)

San Mateo County Watersheds: San Francisco Coastal (1)

Erigeron glaucus – *Lasthenia californica* Association
Lasthenia californica – *Plantago erecta* – *Vulpia microstachys* Herbaceous Alliance

Site Impacts

This association has moderate non-native plant cover (average 20.1%) relative to native cover.

Classification Comments

None.

References: Klein et al. 2015

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=1; San Mateo County (n=1): SMAT0071

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Lupinus versicolor</i>	100.0	100.0	0.2	0.2	0.2		Y		Y
Herb	<i>Lasthenia californica</i>	100.0	67.3	60.0	60	60		Y		Y
	<i>Avena spp.</i>	100.0	5.6	5.0	5	5				Y
	<i>Bromus hordeaceus</i>	100.0	5.6	5.0	5	5				Y
	<i>Anagallis arvensis</i>	100.0	3.4	3.0	3	3				Y
	<i>Layia platyglossa</i>	100.0	3.4	3.0	3	3				Y
	<i>Grindelia stricta</i>	100.0	2.2	2.0	2	2				Y
	<i>Lupinus nanus</i>	100.0	2.2	2.0	2	2				Y
	<i>Bromus maritimus</i>	100.0	1.1	1.0	1	1				Y
	<i>Plantago coronopus</i>	100.0	1.1	1.0	1	1				Y
	<i>Plantago lanceolata</i>	100.0	1.1	1.0	1	1				Y
	<i>Sidalcea malviflora</i>	100.0	1.1	1.0	1	1				Y
	<i>Trifolium campestre</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Calystegia subcaulis</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Eschscholzia californica</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Cirsium quercetorum</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Eriogonum latifolium</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Daucus carota</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Carduus pycnocephalus</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Ranunculus californicus</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Trifolium tomentosum</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Sisyrinchium bellum</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Trifolium spp.</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Polycarpon tetraphyllum</i>	100.0	0.2	0.2	0.2	0.2				Y

Erigeron glaucus – *Lasthenia californica* Association

Lasthenia californica – *Plantago erecta* – *Vulpia microstachys* Herbaceous Alliance

<i>Poa unilateralis</i>	100.0	0.2	0.2	0.2		Y
<i>Hypochaeris radicata</i>	100.0	0.2	0.2	0.2		Y
<i>Soliva sessilis</i>	100.0	0.2	0.2	0.2		Y
<i>Hordeum murinum</i>	100.0	0.2	0.2	0.2		Y
<i>Sonchus asper</i>	100.0	0.2	0.2	0.2		Y
<i>Oxalis pes-caprae</i>	100.0	0.2	0.2	0.2		Y
<i>Clarkia rubicunda</i>	100.0	0.2	0.2	0.2		Y
<i>Medicago spp.</i>	100.0	0.2	0.2	0.2		Y
<i>Lotus wrangelianus</i>	100.0	0.2	0.2	0.2		Y
<i>Erodium cicutarium</i>	100.0	0.2	0.2	0.2		Y
<i>Lolium perenne</i>	100.0	0.2	0.2	0.2		Y
<i>Geranium dissectum</i>	100.0	0.2	0.2	0.2		Y
<i>Hordeum brachyantherum</i>	100.0	0.2	0.2	0.2		Y
<i>Hirschfeldia incana</i>	100.0	0.2	0.2	0.2		Y
<i>Lasthenia californica</i>	100.0	67.3	60.0	60	60	Y
<i>Avena spp.</i>	100.0	5.6	5.0	5	5	Y
<i>Bromus hordeaceus</i>	100.0	5.6	5.0	5	5	Y
<i>Anagallis arvensis</i>	100.0	3.4	3.0	3	3	Y
<i>Layia platyglossa</i>	100.0	3.4	3.0	3	3	Y
<i>Grindelia stricta</i>	100.0	2.2	2.0	2	2	Y
<i>Lupinus nanus</i>	100.0	2.2	2.0	2	2	Y
<i>Bromus maritimus</i>	100.0	1.1	1.0	1	1	Y
<i>Plantago coronopus</i>	100.0	1.1	1.0	1	1	Y
<i>Plantago lanceolata</i>	100.0	1.1	1.0	1	1	Y

***Hemizonia congesta* – *Lolium perenne* Association**

Common Name: *Hemizonia congesta* – Italian Ryegrass Patches

Alliance: *Lasthenia californica* – *Plantago erecta* – *Vulpia microstachys* Herbaceous Alliance

Local Vegetation Description

The *Hemizonia congesta* – Italian Ryegrass Association forms an open herbaceous layer in the single sample available. The shrub layer is sparse and the tree layer is absent. Characteristic herbs include *Hemizonia congesta* and *Lolium perenne*. Those herbs often present include *Avena* spp., *Bromus hordeaceus*, *Chlorogalum pomeridianum*, *Eschscholzia californica*, and *Nassella pulchra*, and herbs that are sometimes present include *Achillea millefolium*, *Aira caryophyllea*, *Anagallis arvensis*, *Briza minor*, *Centaureum muehlenbergii*, *Cryptantha flaccida*, *Cynosurus echinatus*, *Dichelostemma capitatum*, *Eriogonum nudum*, *Euphorbia spathulata*, *Hesperevax sparsiflora*, *Hordeum marinum*, *Hypochaeris glabra*, *Juncus bufonius*, *Leontodon taraxacoides*, *Lotus wrangelianus*, *Medicago* spp., *Plantago erecta*, *Poa secunda*, *Ranunculus californicus*, *Silene gallica*, *Sisyrinchium bellum*, *Streptanthus glandulosus*, *Triteleia laxa*, *Vulpia bromoides*, and *Vulpia microstachys*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	NA	no data	no data
Hardwood	0.0	NA	no data	no data
Regenerating or Shrubby Tree	0.0	NA	no data	no data
Shrub	1.0	NA	no data	no data
Herb	23.0	NA	0.3	0 – 0.5

Local Environmental Description

Elevation: 105 m

Aspect: NE (1)

Slope: 20 degrees

Macro Topography: Middle 1/3 of slope (1)

Large Rock: 1.0%

Small Rock: 6.0%

Fines Cover: 30.0%

Litter Cover: 58%

Soil Texture (field assessed): Moderately fine clay loam (1)

Geology (field or map data): Serpentine (1)

San Mateo County Watersheds: Palo Alto (1)

Site Impacts

This association has moderate non-native plant cover (average 45.2%) relative to native cover. Non- native species that occur with highest frequency and abundance include *Aira caryophylla*, *Anagallis arvensis*, *Avena* spp., *Briza minor*, *Bromus hordeaceus*, *Cynosurus echinatus*, *Hordeum marinum*, *Hypochaeris glabra*, *Leontodon taraxacoides*, *Lolium perenne*, *Medicago* spp., *Silene gallica*, and *Vulpia bromoides*.

Classification Comments

None.

References: Evens and San 2004, Klein et al. 2015

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: N

Surveys Used for Description

Total: N=1; San Mateo County (n=1): SCLAR145

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Lolium perenne</i>	100.0	40.3	10.0	10	10			Y	Y
	<i>Plantago erecta</i>	100.0	20.2	5.0	5	5				Y
	<i>Hemizonia congesta</i>	100.0	12.1	3.0	3	3				Y
	<i>Nassella pulchra</i>	100.0	8.1	2.0	2	2				Y
	<i>Bromus hordeaceus</i>	100.0	4.0	1.0	1	1				Y
	<i>Lasthenia californica</i>	100.0	4.0	1.0	1	1				Y
	<i>Clarkia</i> spp.	100.0	4.0	1.0	1	1				Y
	<i>Euphorbia spathulata</i>	100.0	0.8	0.2	0.2	0.2				Y
	<i>Achillea millefolium</i>	100.0	0.8	0.2	0.2	0.2				Y
	<i>Leptosiphon parviflorus</i>	100.0	0.8	0.2	0.2	0.2				Y
	<i>Plectritis</i> spp.	100.0	0.8	0.2	0.2	0.2				Y
	<i>Eriophyllum</i> spp.	100.0	0.8	0.2	0.2	0.2				Y
	<i>Hesperervax sparsiflora</i>	100.0	0.8	0.2	0.2	0.2				Y
	<i>Galium murale</i>	100.0	0.8	0.2	0.2	0.2				Y
	<i>Dichelostemma</i> spp.	100.0	0.8	0.2	0.2	0.2				Y
	<i>Lotus unifoliolatus</i> var. <i>unifoliolatus</i>	100.0	0.8	0.2	0.2	0.2				Y

***Lasthenia (californica, gracilis)* Association**

Common Name: Goldfields Patches

Alliance: *Lasthenia californica* – *Plantago erecta* – *Vulpia microstachys* Herbaceous Alliance

Local Vegetation Description

The Goldfields Association forms an open to continuous herbaceous layer. The shrub layer is open and the tree layer is absent. Dominant herbs include *Lasthenia californica*, and characteristic herbs include *Chlorogalum pomeridianum*. Those herbs often present include *Achillea millefolium*, *Allium serra*, *Erysimum franciscanum*, *Eschscholzia californica*, *Lolium perenne*, and *Plantago erecta*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	2.5	0.0 – 5.0	0.3	0 – 0.5
Herb	45.1	10.2 – 85	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 340 m, Range 282 – 383 m

Aspect: NE (3)

Slope: Mean 21 degrees, Range 2 – 31 degrees

Macro Topography: Upper 1/3 of slope to Ridgetop (1), Middle 1/3 of slope (1), Upper 1/3 of slope (1)

Large Rock: Mean 1.8%, Range 0.6 – 3.0%

Small Rock: Mean 48.6%, Range 15.2 – 82.0%

Fines Cover: Mean 26.3%, Range 7.0 – 60.0%

Litter Cover: Mean 9.3%, Range 1.0 – 20%

Soil Texture (field assessed): Fine clay (1), Moderately fine sandy clay loam (1), Fine sandy clay (1)

Geology (field or map data): Serpentine (2), Mixed sedimentary (1)

San Mateo County Watersheds: San Mateo Bayside (1)

Other Watersheds, Santa Clara Co.: Coyote Creek (2)

Site Impacts

This association has moderate non-native plant cover (average 24.4%) relative to native cover.

Classification Comments

Lasthenia (californica, gracilis) Association
Lasthenia californica – *Plantago erecta* – *Vulpia microstachys* Herbaceous Alliance

Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Buck-Diaz and Evens 2011b, Buck-Diaz et al. 2011, Buck-Diaz et al. 2012, Buck-Diaz et al.

2013, Rodriguez 2015, Taylor et al. 1992, VegCAMP 2015b

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=3; San Mateo County (n=1): SMAT0037

Santa Clara County (n=2): COYO023, SCLAR129

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Eriophyllum confertiflorum</i>	33.3	33.3	0.7	2	2				
	<i>Baccharis pilularis</i>	33.3	32.1	1.7	5	5				
	<i>Lupinus albifrons</i>	33.3	1.3	0.1	0.2	0.2				
Herb	<i>Lasthenia californica</i>	100.0	50.0	21.0	8	30		Y		Y
	<i>Chlorogalum pomeridianum</i>	100.0	1.3	0.7	0.1	1				Y
	<i>Lolium perenne</i>	66.7	6.1	2.7	0.1	8				Y
	<i>Eschscholzia californica</i>	66.7	1.9	1.7	0.1	5				Y
	<i>Achillea millefolium</i>	66.7	0.9	0.7	0.1	2				Y
	<i>Allium serra</i>	66.7	0.4	0.1	0.1	0.2				Y
	<i>Plantago erecta</i>	66.7	0.4	0.1	0.1	0.2				Y
	<i>Erysimum franciscanum</i>	66.7	0.3	0.1	0.1	0.2				Y
	<i>Avena spp.</i>	33.3	6.7	6.7	20	20				
	<i>Briza maxima</i>	33.3	6.7	6.7	20	20				
	<i>Calystegia collina</i>	33.3	2.9	1.3	4	4				
	<i>Vulpia microstachys</i>	33.3	2.7	0.3	1	1				
	<i>Leptosiphon ambiguus</i>	33.3	2.7	0.3	1	1				
	<i>Bromus hordeaceus</i>	33.3	2.7	0.3	1	1				
	<i>Sanicula bipinnatifida</i>	33.3	2.2	1.0	3	3				
	<i>Rumex acetosella</i>	33.3	1.7	1.7	5	5				
	<i>Layia platyglossa</i>	33.3	1.5	0.7	2	2				
	<i>Erodium botrys</i>	33.3	1.0	1.0	3	3				
<i>Heterotheca sessiliflora</i>	33.3	1.0	1.0	3	3					
<i>Hemizonia congesta</i>	33.3	0.7	0.3	1	1					

Lasthenia (californica, gracilis) Association

Lasthenia californica – *Plantago erecta* – *Vulpia microstachys* Herbaceous Alliance

<i>Salvia spathacea</i>	33.3	0.7	0.7	2	2
<i>Viola pedunculata</i>	33.3	0.3	0.3	1	1
<i>Sidalcea malviflora</i>	33.3	0.3	0.3	1	1
<i>Claytonia perfoliata</i>	33.3	0.3	0.3	1	1
<i>Foeniculum vulgare</i>	33.3	0.3	0.3	1	1
<i>Grindelia stricta</i>	33.3	0.3	0.3	1	1
<i>Lathyrus vestitus</i>	33.3	0.3	0.3	1	1
<i>Carduus pycnocephalus</i>	33.3	0.3	0.3	1	1
<i>Poa secunda</i>	33.3	0.3	0.0	0.1	0.1
<i>Cryptantha flaccida</i>	33.3	0.3	0.0	0.1	0.1
<i>Corethrogyne filaginifolia</i>	33.3	0.3	0.0	0.1	0.1
<i>Castilleja exserta</i>	33.3	0.3	0.0	0.1	0.1
<i>Elymus multisetus</i>	33.3	0.3	0.0	0.1	0.1
<i>Clarkia purpurea</i>	33.3	0.3	0.0	0.1	0.1
<i>Fritillaria liliacea</i>	33.3	0.1	0.1	0.2	0.2
<i>Lomatium utriculatum</i>	33.3	0.1	0.1	0.2	0.2
<i>Sisyrinchium bellum</i>	33.3	0.1	0.1	0.2	0.2
<i>Ranunculus californicus</i>	33.3	0.1	0.1	0.2	0.2
<i>Hordeum spp.</i>	33.3	0.1	0.1	0.2	0.2
<i>Muilla maritima</i>	33.3	0.1	0.1	0.2	0.2
<i>Cirsium quercetorum</i>	33.3	0.1	0.1	0.2	0.2
<i>Castilleja densiflora</i>	33.3	0.1	0.1	0.2	0.2
<i>Sherardia arvensis</i>	33.3	0.1	0.1	0.2	0.2
<i>Marah oreganus</i>	33.3	0.1	0.1	0.2	0.2
<i>Dichelostemma capitatum</i>	33.3	0.1	0.1	0.2	0.2
<i>Eriogonum latifolium</i>	33.3	0.1	0.1	0.2	0.2
Non-Vascular					
Lichen	33.3	33.3	0.7	2	2
Moss	33.3	33.3	0.0	0.1	0.1

***Lasthenia californica* – *Plantago erecta* – *Hesperervax sparsiflora* Association**

Common Name: California goldfields – dwarf plantain – erect evax Patches

Alliance: *Lasthenia californica* – *Plantago erecta* – *Vulpia microstachys* Herbaceous Alliance

Local Vegetation Description

The California goldfields – dwarf plantain – erect evax Association forms an open to intermittent herbaceous layer. The shrub layer is sparse and the tree layer is absent. Characteristic herbs include *Chlorogalum pomeridianum*, *Lasthenia californica*, *Lolium perenne*, and *Plantago erecta*. Those herbs often present include *Achillea millefolium*, *Bromus hordeaceus*, *Cryptantha flaccida*, *Eriogonum nudum*, *Eschscholzia californica*, *Hesperervax sparsiflora*, *Lomatium utriculatum*, *Lotus wrangelianus*, *Nassella pulchra*, and *Vulpia microstachys*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.1	0.0 – 0.2	0.3	0 – 0.5
Herb	35.6	23 – 60	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 151 m, Range 97 – 207 m

Aspect: NW (2), NE (2), SW (1)

Slope: Mean 12 degrees, Range 2 – 26 degrees

Macro Topography: Middle 1/3 of slope (2), Upper 1/3 of slope (2), Ridge top (1)

Large Rock: Mean 5.0%, Range 0.0 – 16.0%

Small Rock: Mean 33.6%, Range 0.0 – 75.0%

Fines Cover: Mean 32.8%, Range 3.0 – 74.0%

Litter Cover: Mean 20.8%, Range 2.0 – 45%

Soil Texture (field assessed): Fine clay (1), Fine silty clay (1), Moderately fine clay loam (1), Moderately fine sandy clay loam (1), Unknown (1)

Geology (field or map data): Ultramafic rocks, mostly serpentine (2), Serpentine (2), Ultramafic (type unknown) (1)

San Mateo County Watersheds: Palo Alto (1), San Mateo Bayside (1)

Other Watersheds, Marin Co.: San Rafael (2), Lagunitas Creek (1)

Site Impacts

Lasthenia californica – *Plantago erecta* – *Hesperervax sparsiflora* Association
Lasthenia californica – *Plantago erecta* – *Vulpia microstachys* Herbaceous Alliance

This association has low non-native plant cover (average 14.7%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Bromus hordeaceus* and *Lolium perenne*.

Classification Comments

Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Buck and Evens 2010, Buck-Diaz et al. 2020, Evens and San 2004, McCarten 1991, Rodriguez-Rojo et al. 2001a

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=5; San Mateo County (n=2): SCLAR123, SMAT0058

Marin County (n=3): MARIN210, MOSD0330, MOSD0335

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Lasthenia californica</i>	100.0	13.1	6.2	2	20				Y
	<i>Plantago erecta</i>	80.0	16.5	4.1	0.2	10				Y
	<i>Chlorogalum pomeridianum</i>	80.0	2.7	0.8	0.2	2				Y
	<i>Lolium perenne</i>	60.0	13.6	5.4	0.2	17				Y
	<i>Vulpia microstachys</i>	60.0	6.8	3.8	0.2	15				Y
	<i>Melica torreyana</i>	60.0	1.7	0.5	0.2	2				Y
	<i>Eschscholzia californica</i>	60.0	1.4	1.1	0.2	5				Y
	<i>Achillea millefolium</i>	60.0	1.3	0.3	0.2	1				Y
	<i>Nassella pulchra</i>	60.0	0.7	0.5	0.2	2				Y
	<i>Poa secunda</i>	60.0	0.5	0.3	0.2	1				Y
	<i>Lotus wrangelianus</i>	60.0	0.3	0.1	0.2	0.2				Y
	<i>Bromus carinatus</i>	40.0	4.5	1.8	4	5				
	<i>Lomatium dasycarpum</i>	40.0	2.8	0.6	1	2				
	<i>Layia platyglossa</i>	40.0	1.5	0.4	0.2	2				
	<i>Sisyrinchium bellum</i>	40.0	1.1	0.2	0.2	1				
	<i>Platystemon californicus</i>	40.0	1.0	0.8	0.2	4				
	<i>Nassella lepida</i>	40.0	1.0	0.8	0.2	4				
	<i>Danthonia californica</i>	40.0	0.9	0.2	0.2	1				
	<i>Trifolium willdenovii</i>	40.0	0.6	0.4	0.2	2				
	<i>Eriogonum nudum</i>	40.0	0.4	0.2	0.2	1				
	<i>Calystegia subacaulis</i>	40.0	0.4	0.2	0.2	1				
	<i>Pentagramma</i>	40.0	0.4	0.1	0.2	0.2				

Lasthenia californica – *Plantago erecta* – *Hesperervax sparsiflora* Association
Lasthenia californica – *Plantago erecta* – *Vulpia microstachys* Herbaceous Alliance

<i>triangularis</i>					
<i>Ranunculus californicus</i>	40.0	0.4	0.1	0.2	0.2
<i>Sanicula bipinnatifida</i>	40.0	0.4	0.1	0.2	0.2
<i>Monardella purpurea</i>	40.0	0.4	0.1	0.2	0.2
<i>Hemizonia congesta</i>	40.0	0.3	0.1	0.2	0.2
<i>Lactuca serriola</i>	40.0	0.3	0.1	0.2	0.2
<i>Castilleja densiflora</i>	40.0	0.3	0.1	0.2	0.2
<i>Hesperevax sparsiflora</i>	40.0	0.3	0.1	0.2	0.2
<i>Calycadenia</i>					
<i>multiglandulosa</i>	40.0	0.3	0.1	0.2	0.2
<i>Silene gallica</i>	40.0	0.2	0.1	0.2	0.2
<i>Epilobium minutum</i>	40.0	0.2	0.1	0.2	0.2
<i>Trifolium</i>					
<i>albopurpureum</i>	40.0	0.2	0.1	0.2	0.2
Non-Vascular					
Moss	40.0	21.3	4.0	0.2	20

***Vulpia microstachys* – *Plantago erecta* – *Calycadenia (truncata, multiglandulosa)* Association**

Common Name: Small Fescue – Dwarf Plantain – Rosin Weed Patches

Alliance: *Lasthenia californica* – *Plantago erecta* – *Vulpia microstachys* Herbaceous Alliance

Local Vegetation Description

The Small Fescue – Dwarf Plantain – Rosin Weed Association forms an intermittent herbaceous layer. The shrub layer is open and the tree layer is absent. Characteristic herbs include *Bromus hordeaceus*, *Calycadenia multiglandulosa*, *Nassella pulchra*, and *Plantago erecta*. Those herbs often present include *Avena* spp., *Chlorogalum pomeridianum*, *Elymus multisetus*, *Eriogonum nudum*, *Eschscholzia californica*, *Lolium perenne*, *Poa secunda*, and *Vulpia microstachys*. Commonly associated non-vascular plants include Moss.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.0	0 – 0	no data	no data
Herb	47.7	39 – 55	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 215 m, Range 153 – 314 m

Aspect: SW (2), NW (1)

Slope: Mean 10 degrees, Range 2 – 18 degrees

Macro Topography: Ridge top (1), Upper 1/3 of slope (1), Upper 1/3 of slope to Ridgetop (1)

Large Rock: Mean 12.1%, Range 4.2 – 20.0%

Small Rock: Mean 16.6%, Range 5.2 – 28.0%

Fines Cover: Mean 17.3%, Range 4.0 – 27.0%

Litter Cover: Mean 20.7%, Range 0.2 – 60%

Soil Texture (field assessed): Moderately fine sandy clay loam (1), Medium silt (1)

Geology (field or map data): Serpentine (2), Alluvium (1)

San Mateo County Watersheds: Palo Alto (1)

Other Watersheds, Santa Clara Co.: Coyote Creek (1), Guadalupe River (1)

Site Impacts

This association has moderate non-native plant cover (average 32.8%) relative to native cover. Non- native species that occur with highest frequency and abundance

Vulpia microstachys – *Plantago erecta* – *Calycadenia (truncata, multiglandulosa)* Association
Lasthenia californica – *Plantago erecta* – *Vulpia microstachys* Herbaceous Alliance

include *Aira caryophyllea*, *Anagallis arvensis*, *Avena* spp., *Bromus hordeaceus*, *Lolium perenne*, and *Silene gallica*.

Classification Comments

Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Evens and Kentner 2006, Evens and San 2004, Klein et al. 2007, Klein et al. 2015

Global Rarity Rank: G2 **State Rarity Rank:** S2? **State Rare:** Y

Surveys Used for Description

Total: N=3; San Mateo County (n=1): SMAT0244

Santa Clara County (n=2): CORT087, COYO066

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Calycadenia multiglandulosa</i>	100.0	15.8	9.7	1	20				Y
	<i>Plantago erecta</i>	100.0	11.7	11.4	0.1	34				Y
	<i>Nassella pulchra</i>	100.0	7.4	3.4	0.2	5				Y
	<i>Bromus hordeaceus</i>	100.0	4.4	2.4	0.1	7				Y
	<i>Elymus multisetus</i>	100.0	2.2	2.1	0.1	6				Y
	<i>Lolium perenne</i>	66.7	25.2	11.7	15	20				Y
	<i>Vulpia microstachys</i>	66.7	9.9	9.7	0.1	29				Y
	<i>Poa secunda</i>	66.7	2.7	1.1	0.2	3				Y
	<i>Trifolium willdenovii</i>	66.7	0.8	0.7	0.1	2				Y
	<i>Eschscholzia californica</i>	66.7	0.4	0.4	0.1	1				Y
	<i>Chlorogalum pomeridianum</i>	66.7	0.2	0.1	0.1	0.2				Y
	<i>Eriogonum nudum</i>	66.7	0.2	0.1	0.1	0.2				Y
	<i>Calochortus venustus</i>	66.7	0.2	0.1	0.1	0.2				Y
	<i>Achillea millefolium</i>	66.7	0.2	0.1	0.1	0.2				Y
	<i>Lasthenia californica</i>	33.3	8.7	3.3	10	10				
	<i>Melica torreyana</i>	33.3	5.1	5.0	15	15				
	<i>Avena</i> spp.	33.3	1.7	0.7	2	2				
	<i>Lactuca saligna</i>	33.3	1.2	0.7	2	2				
	<i>Clarkia rubicunda</i>	33.3	0.3	0.3	1	1				
	<i>Hemizonia congesta</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Castilleja</i> spp.	33.3	0.1	0.0	0.1	0.1				

Vulpia microstachys – *Plantago erecta* – *Calycadenia* (*truncata*, *multiglandulosa*) Association
Lasthenia californica – *Plantago erecta* – *Vulpia microstachys* Herbaceous Alliance

	<i>Cryptantha flaccida</i>	33.3	0.1	0.0	0.1	0.1	
	<i>Cuscuta</i> spp.	33.3	0.1	0.0	0.1	0.1	
	<i>Calystegia collina</i>	33.3	0.1	0.0	0.1	0.1	
	<i>Dudleya setchellii</i>	33.3	0.1	0.0	0.1	0.1	
	<i>Dichelostemma capitatum</i>	33.3	0.1	0.0	0.1	0.1	
	<i>Bromus madritensis</i>	33.3	0.1	0.0	0.1	0.1	
	<i>Allium serra</i>	33.3	0.1	0.0	0.1	0.1	
	<i>Crassula connata</i>	33.3	0.1	0.0	0.1	0.1	
	<i>Sanicula bipinnatifida</i>	33.3	0.1	0.0	0.1	0.1	
	<i>Vulpia myuros</i>	33.3	0.1	0.0	0.1	0.1	
	<i>Trifolium</i> spp.	33.3	0.1	0.0	0.1	0.1	
	<i>Sisyrinchium bellum</i>	33.3	0.1	0.0	0.1	0.1	
	<i>Phacelia imbricata</i>	33.3	0.1	0.0	0.1	0.1	
	<i>Lomatium utriculatum</i>	33.3	0.1	0.0	0.1	0.1	
	<i>Monardella douglasii</i>	33.3	0.1	0.1	0.2	0.2	
	<i>Pentagramma triangularis</i>	33.3	0.1	0.1	0.2	0.2	
	<i>Koeleria macrantha</i>	33.3	0.1	0.1	0.2	0.2	
	<i>Streptanthus glandulosus</i>	33.3	0.1	0.1	0.2	0.2	
Non-Vascular							
	Moss	66.7	50.0	6.7	0.2	20	Y
	Lichen	66.7	50.0	6.7	0.2	20	Y

***Lasthenia glaberrima* Herbaceous Alliance**



Common Name: Smooth goldfields vernal pool bottoms

NVC Alliance Code: A4172. *Lasthenia glaberrima* Vernal Pool Alliance

Statewide Description

Lasthenia glaberrima is typically co-dominant or characteristically present in the herbaceous layer with *Alopecurus saccatus*, *Callitriche marginata*, *Castilleja campestris*, *Centromadia fitchii*, *Crassula aquatica*, *Distichlis spicata*, *Downingia bicornuta*, *Downingia cuspidata*, *Downingia insignis*, *Eleocharis macrostachya*, *Eryngium* spp., *Glyceria occidentalis*, *Gratiola ebracteata*, *Holocarpha virgata*, *Isoetes howellii*, *Lasthenia fremontii*, *Lilaea scilloides*, *Lupinus bicolor*, *Lythrum hyssopifolia*, *Lythrum portula*, *Myosurus minimus*, *Plagiobothrys stipitatus* var. *micranthus*, *Pleuropogon californicus*, *Pogogyne douglasii*, *Psilocarphus brevissimus* var. *brevissimus*, *Ranunculus bonariensis* var. *trisepalus*, and *Trifolium variegatum*. Other common species include *Hordeum marinum*, *Leontodon saxatilis*, *Lolium perenne*, or *Polypogon monspeliensis*.

Barbour et al. (2003, 2007b) recognized the *Downingia* – *Lasthenia* Class for California vernal pool vegetation on all geomorphic surfaces, landscapes, and soil types in the Central Valley and adjacent foothills. Within that class, Barbour et al. recognized this *Lasthenia glaberrima* Alliance for vegetation of deeper pools bottoms. The alliance has a high constancy and abundance of *Lasthenia glaberrima* and/or *Eleocharis macrostachya*, which are extremely flood tolerant. Associations in this alliance differ

Leymus cinereus – *Leymus triticoides* Herbaceous Alliance

from other freshwater vernal pool alliances in their absence or much lower constancy of species adapted to short inundation periods such as *Blennosperma nanum* var. *nanum*, *Centromadia fitchii*, *Cicendia quadrangularis*, *Downingia cuspidata*, *Lepidium nitidum*, *Limnanthes douglasii* ssp. *rosea*, *Plagiobothrys greenei*, and *Trifolium depauperatum*. Lengthy inundation also leads to a lower degree of invasion by non-natives. However, stands do have *Downingia bicornuta* and *Eryngium castrense*, which grow across pools of varying degrees of inundation.

The *Lasthenia glaberrima* Alliance occurs on a variety of geomorphic surfaces, landforms, and soil series. Stands occur primarily in freshwater pools but sometimes occur in slightly saline/alkaline pools. Within the alliance are six associations: three that are characteristic of hardpan and volcanic rock pools, and three that are found in claypan pools (Barbour et al. 2007b).

Local Vegetation Description

The Smooth goldfields vernal pool bottoms Alliance forms an intermittent to continuous herbaceous layer. The shrub layer is absent and the tree layer is absent. Dominant herbs include *Pleuropogon californicus*, and characteristic herbs include *Hordeum marinum* and *Mentha pulegium*. Those herbs often present include *Croton setigerus*, *Cyperus eragrostis*, *Eleocharis macrostachya*, *Epilobium densiflorum*, *Hordeum brachyantherum*, *Limnanthes douglasii*, *Lolium perenne*, *Lythrum hyssopifolium*, *Rumex conglomeratus*, *Rumex crispus*, and *Xanthium strumarium*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.0	0 – 0	no data	no data
Herb	70.0	60 – 80	0.5	0 – 1

Local Membership Rule

Pleuropogon californicus and/or *Lasthenia glaberrima* are present, sometimes with high cover in the herbaceous layer along with *Limnanthes douglasii*, *Navarretia leucocephala*, *Eryngium aristulatum*, and/or *Isoetes howellii*. If *Eleocharis macrostachya* or *E. palustris* is present and co-dominant, key to this alliance instead of *Eleocharis*. Stands typically occur in vernal pools or vernal influenced marshes.

Local Environmental Description

Elevation: Mean 67 m, Range 14 – 120 m

Aspect: Flat (2)

Slope: Mean 1 degrees, Range 0 – 1 degrees

Macro Topography: Bottom to Lower 1/3 of slope (1), Lower 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 44.1%, Range 0.2 – 88%

Leymus cinereus – *Leymus triticoides* Herbaceous Alliance

Litter Cover: Mean 54.0%, Range 10 – 98%

Soil Texture (field assessed): Medium silt loam (1), Not recorded (1)

Geology (field or map data): Sandstone and other sedimentary (1), Sandstone, shale, and gravel deposits (1)

San Mateo County Watersheds: Palo Alto (1)

Other Watersheds, Marin Co.: Estero San Antonio (1)

Site Impacts

This alliance has moderate non-native plant cover (average 38.8%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Hordeum marinum*, *Lythrum hyssopifolium*, *Mentha pulegium*, *Rumex conglomeratus*, and *Rumex crispus*.

Associations in San Mateo County

- *Lasthenia glaberrima* – *Pleuropogon californicus*

Classification Comments

Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: Barbour et al. 2003, Barbour et al. 2007b, Klein et al. 2015

Global Rarity Rank: G2

State Rarity Rank: S2

Surveys Used for Description

Total: N=2; San Mateo County (n=1): SMAT0243

Marin County (n=1): MARIN231

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Pleuropogon californicus</i>	100.0	58.3	38.5	17	60	Y	Y		Y
	<i>Mentha pulegium</i>	100.0	21.6	17.6	0.2	35	Y			Y
	<i>Hordeum marinum</i>	100.0	0.3	0.2	0.2	0.2	Y			Y
	<i>Lolium perenne</i>	50.0	16.5	13.5	27	27				Y
	<i>Limnanthes douglasii</i>	50.0	1.6	1.0	2	2				Y
	<i>Croton setigerus</i>	50.0	0.6	0.5	1	1				Y
	<i>Rumex conglomeratus</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Eleocharis macrostachya</i>	50.0	0.1	0.1	0.2	0.2				Y

Leymus cinereus – *Leymus triticoides* Herbaceous Alliance

<i>Xanthium strumarium</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Rumex crispus</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Lythrum hyssopifolium</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Epilobium densiflorum</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Cyperus eragrostis</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Hordeum brachyantherum</i>	50.0	0.1	0.1	0.2	0.2	Y

***Lasthenia glaberrima* – *Pleuropogon californicus* Association**

Common Name: Smooth Goldfield Patches

Alliance: *Lasthenia glaberrima* Herbaceous Alliance

Classification Comments

The association circumscription is the same as that of the alliance. See above for detailed description.

References: Barbour et al. 2003, Barbour et al. 2007b, Klein et al. 2015

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Pleuropogon californicus</i>	100.0	58.3	38.5	17	60		Y		Y
	<i>Mentha pulegium</i>	100.0	21.6	17.6	0.2	35				Y
	<i>Hordeum marinum</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Lolium perenne</i>	50.0	16.5	13.5	27	27				Y
	<i>Limnanthes douglasii</i>	50.0	1.6	1.0	2	2				Y
	<i>Croton setigerus</i>	50.0	0.6	0.5	1	1				Y
	<i>Rumex conglomeratus</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Xanthium strumarium</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Epilobium densiflorum</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Lythrum hyssopifolium</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Eleocharis macrostachya</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Cyperus eragrostis</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Rumex crispus</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Hordeum brachyantherum</i>	50.0	0.1	0.1	0.2	0.2				Y

***Leymus cinereus* – *Leymus triticoides* Herbaceous Alliance**



Common Name: Ashy ryegrass – creeping ryegrass turfs

NVC Alliance Code: A1329. *Leymus cinereus* - *Leymus triticoides* Alkaline Wet Meadow Alliance

Statewide Description

Leymus cinereus and/or *Leymus triticoides* is dominant or co-dominant in the herbaceous layer with *Ambrosia psilostachya*, *Anemopsis californica*, *Aristida purpurea*, *Avena fatua*, *Bromus* spp., *Danthonia unispicata*, *Distichlis spicata*, *Elymus elymoides*, *Hordeum* spp., *Juncus arcticus*, *Lolium perenne*, *Poa secunda* or *Triglochin maritima*. Emergent trees and shrubs may be present at low cover.

Many regional descriptions include the alliance in an alkali meadow category. Stands often occur in a fine mosaic with upland shrublands, including *Artemisia tridentata* and *Sarcobatus vermiculatus* alliances.

Soils are influenced by accumulations of coarse to fine volcanic tephra (Young et al. 2007).

The two primary species in this alliance were treated separately in the 2009 book, *A Manual of California Vegetation*, second edition. *Leymus cinereus* and *L. triticoides* may hybridize when they co-occur.

Leymus triticoides also hybridizes with another large California species, *L. condensatus* in the western Mojave and in the southern Sierra Nevada Foothills. The resulting species

complexes are often difficult to identify and may be ecologically overlapping.

Local Vegetation Description

The Ashy ryegrass – creeping ryegrass turfs Alliance forms a continuous herbaceous layer. The shrub layer is open and the tree layer is absent. Dominant herbs include *Elymus triticoides*, and characteristic herbs include *Lolium perenne*. Those herbs often present include *Avena* spp., *Bromus hordeaceus*, and *Carduus pycnocephalus*, and herbs that are sometimes present include *Brassica nigra*, *Briza minor*, *Bromus diandrus*, *Bromus madritensis*, *Chlorogalum pomeridianum*, *Erodium botrys*, *Geranium dissectum*, *Holcus lanatus*, *Hordeum brachyantherum*, *Juncus arcticus*, *Juncus patens*, *Picris echioides*, *Rumex acetosella*, *Rumex conglomeratus*, *Sisyrinchium bellum*, *Sonchus asper*, *Vicia sativa*, and *Vulpia bromoides*. Commonly associated non-vascular plants include Moss.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0.4	no data	no data
Shrub	3.3	0 – 10	0.8	0.5 – 1
Herb	73.3	70 – 80	0.5	0 – 1

Local Membership Rule

Leymus triticoides dominates or co-dominates with *Lolium perenne* or other non-native grasses or forbs. Stands are found on poorly drained floodplains, valley bottoms, and brackish marsh margins.

Local Environmental Description

Elevation: Mean 99 m, Range 3 – 269 m

Aspect: SE (2), NE (2), N (2), Flat (2), SW (1)

Slope: Mean 4 degrees, Range 0 – 10 degrees

Macro Topography: Bottom (3), Middle 1/3 of slope (2), Ridge top (1), Lower 1/3 of slope (1), Draw (1), Toeslope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 1.6%, Range 0.0 – 8.0%

Litter Cover: Mean 30.2%, Range 0.2 – 91%

Soil Texture (field assessed): Fine clay (1), Medium silt loam (1), Moderately fine silty clay loam (1)

Geology (field or map data): Sandstone and other sedimentary (4), Shale and other sedimentary (3), Alluvium (2), Serpentine (1)

San Mateo County Watersheds: San Mateo Bayside (1), Tunitas Creek (1)

Other Watersheds, Marin Co.: Estero San Antonio (1); **Santa Clara Co.:** Guadalupe River (3), Palo Alto (3), Coyote Creek (1)

Site Impacts

This alliance has moderate non-native plant cover (average 35.9%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Brassica nigra*, *Briza minor*, *Bromus diandrus*, *Bromus hordeaceus*, *Bromus madritensis*, *Carduus pycnocephalus*, *Erodium botrys*, *Geranium dissectum*, *Holcus lanatus*, *Picris echioides*, *Rumex acetosella*, *Rumex conglomeratus*, *Sonchus asper*, *Vicia sativa*, and *Vulpia bromoides*.

Associations in San Mateo County

- *Leymus triticoides*

Classification Comments

Leymus triticoides and *Elymus triticoides* are synonymous. Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: Buck-Diaz and Evens 2011b, Buck-Diaz et al. 2011, Buck-Diaz et al. 2012, Buck-Diaz et al.

2013, Evens and San 2004, Holstein 2001, Keeler-Wolf and Evens 2006, Keeler-Wolf and Vaghti 2000, Kittel et al. 2012, Klein et al. 2015, NatureServe 2007, Rodriguez et al. 2017, Solomeshch and Barbour 2006, Sproul et al. 2011, VegCAMP 2015a

Global Rarity Rank: G3

State Rarity Rank: S3

Surveys Used for Description

Total: N=10; San Mateo County (n=2): CORT086, SMAT0164

Marin County (n=1): MARIN229

Santa Clara County (n=7): CORT096, CORT098, CORT111, CORT112, CORT113, CORT143, COYO009

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	20.0	20.0	1.1	1	10.2				
Herb	<i>Elymus triticoides</i>	100.0	61.8	70.6	8	98	Y	Y		Y
	<i>Lolium perenne</i>	90.0	15.0	17.0	1	60	Y			Y
	<i>Avena spp.</i>	60.0	2.2	4.3	0.2	39				Y
	<i>Bromus hordeaceus</i>	60.0	1.2	1.9	0.1	7				Y
	<i>Carduus pycnocephalus</i>	50.0	4.7	7.3	0.2	37				Y
	<i>Erodium botrys</i>	40.0	2.7	3.7	1	16				
	<i>Bromus madritensis</i>	40.0	1.0	1.6	0.2	15				
	<i>Bromus diandrus</i>	40.0	0.7	1.2	0.2	9				

Leymus cinereus – *Leymus triticoides* Herbaceous Alliance

<i>Geranium dissectum</i>	30.0	0.5	0.9	0.2	9	
<i>Sonchus asper</i>	30.0	0.3	0.4	0.2	4	
<i>Rumex conglomeratus</i>	30.0	0.3	0.3	0.2	2	
<i>Juncus arcticus</i>	30.0	0.1	0.1	0.2	0.2	
<i>Juncus patens</i>	30.0	0.1	0.1	0.2	0.2	
<i>Brassica nigra</i>	30.0	0.0	0.1	0.2	0.2	
<i>Chlorogalum pomeridianum</i>	30.0	0.0	0.1	0.1	0.2	
<i>Holcus lanatus</i>	20.0	0.7	0.5	0.2	5	
<i>Picris echioides</i>	20.0	0.4	0.5	0.2	5	
<i>Vicia sativa</i>	20.0	0.3	0.4	1	3	
<i>Vulpia bromoides</i>	20.0	0.2	0.1	0.2	1	
<i>Briza minor</i>	20.0	0.1	0.1	0.2	1	
<i>Hordeum brachyantherum</i>	20.0	0.0	0.0	0.2	0.2	
<i>Sisyrinchium bellum</i>	20.0	0.0	0.0	0.2	0.2	
<i>Rumex acetosella</i>	20.0	0.1	0.0	0.2	0.2	
Non-Vascular						
Moss	60.0	60.0	0.1	0.2	0.2	Y

***Leymus triticoides* Association**

Common Name: Creeping Wildrye Patches

Alliance: *Leymus cinereus* – *Leymus triticoides* Herbaceous Alliance

Local Vegetation Description

The Creeping Wildrye Association forms a continuous herbaceous layer. The shrub layer is open and the tree layer is absent. Dominant herbs include *Elymus triticoides*, and characteristic herbs include *Lolium perenne*. Those herbs often present include *Avena* spp., *Bromus hordeaceus*, *Bromus madritensis*, *Carduus pycnocephalus*, and *Erodium botrys*, and herbs that are sometimes present include *Brassica nigra*, *Briza minor*, *Bromus diandrus*, *Chlorogalum pomeridianum*, *Hordeum brachyantherum*, *Juncus arcticus*, *Juncus patens*, *Picris echioides*, *Rumex conglomeratus*, *Sisyrinchium bellum*, and *Sonchus asper*. Commonly associated non-vascular plants include Moss.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	5.1	0.2 – 10.0	0.8	0.5 – 1
Herb	69.5	69 – 70	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 11 m, Range 3 – 18 m

Aspect: NE (1), Flat (1)

Slope: Mean 2 degrees, Range 0 – 3 degrees

Macro Topography: Bottom (1), Toeslope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 2.6%, Range 0.2 – 5.0%

Litter Cover: Mean 45.6%, Range 0.2 – 91%

Soil Texture (field assessed): Fine clay (1)

Geology (field or map data): Alluvium (2)

San Mateo County Watersheds: San Mateo Bayside (1), Tunitas Creek (1)

Site Impacts

This association has moderate non-native plant cover (average 21.6%) relative to native cover.

Classification Comments

Leymus triticoides and *Elymus triticoides* are synonymous.

Leymus triticoides Association
Leymus cinereus – *Leymus triticoides* Herbaceous Alliance

References: Buck-Diaz and Evens 2011b, Buck-Diaz et al. 2011, Buck-Diaz et al. 2012, Buck-Diaz et al.

2013, Holstein 2001, Keeler-Wolf and Evens 2006, Keeler-Wolf and Vaghti 2000, Kittel et al. 2012, Klein et al. 2015, NatureServe 2007, Rodriguez et al. 2017, Solomeshch and Barbour 2006, Sproul et al. 2011, VegCAMP 2015a

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=2; San Mateo County (n=2): CORT086, SMAT0164

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	33.3	33.3	3.4	10.2	10.2				
	<i>Ericameria ericoides</i>	33.3	33.3	0.1	0.2	0.2				
Herb	<i>Elymus triticoides</i>	100.0	53.4	53.7	8	93		Y		Y
	<i>Juncus patens</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Lolium perenne</i>	66.7	24.7	20.3	1	60				Y
	<i>Holcus lanatus</i>	66.7	2.4	1.7	0.2	5				Y
	<i>Picris echioides</i>	66.7	1.3	1.7	0.2	5				Y
	<i>Sonchus asper</i>	66.7	1.1	1.4	0.2	4				Y
	<i>Rumex conglomeratus</i>	66.7	1.0	1.0	1	2				Y
	<i>Vulpia bromoides</i>	66.7	0.5	0.4	0.2	1				Y
	<i>Briza minor</i>	66.7	0.3	0.4	0.2	1				Y
	<i>Rumex acetosella</i>	66.7	0.2	0.1	0.2	0.2				Y
	<i>Geranium dissectum</i>	66.7	0.2	0.1	0.2	0.2				Y
	<i>Juncus arcticus</i>	66.7	0.1	0.1	0.2	0.2				Y
	<i>Potentilla anserina</i>	33.3	4.0	3.3	10	10				
	<i>Vulpia myuros</i>	33.3	3.8	5.3	16	16				
	<i>Raphanus sativus</i>	33.3	2.9	4.0	12	12				
	<i>Carex spp.</i>	33.3	0.9	0.7	2	2				
	<i>Gastridium phleoides</i>	33.3	0.7	1.0	3	3				
	<i>Carduus pycnocephalus</i>	33.3	0.7	1.0	3	3				
	<i>unknown Poaceae</i>	33.3	0.4	0.3	1	1				
	<i>Aira caryophyllea</i>	33.3	0.1	0.1	0.2	0.2				
<i>Sisyrinchium bellum</i>	33.3	0.1	0.1	0.2	0.2					
<i>Parentucellia viscosa</i>	33.3	0.1	0.1	0.2	0.2					
<i>Monardella villosa</i>	33.3	0.1	0.1	0.2	0.2					
<i>Juncus phaeocephalus</i>	33.3	0.1	0.1	0.2	0.2					

Leymus triticoides Association
Leymus cinereus – *Leymus triticoides* Herbaceous Alliance

	<i>Juncus occidentalis</i>	33.3	0.1	0.1	0.2	0.2
	<i>Rumex crispus</i>	33.3	0.1	0.1	0.2	0.2
	<i>Eleocharis macrostachya</i>	33.3	0.1	0.1	0.2	0.2
	<i>Oenanthe sarmentosa</i>	33.3	0.1	0.1	0.2	0.2
	<i>Poa pratensis</i>	33.3	0.1	0.1	0.2	0.2
	<i>Foeniculum vulgare</i>	33.3	0.0	0.1	0.2	0.2
	<i>Hordeum brachyantherum</i>	33.3	0.0	0.1	0.2	0.2
	<i>Rumex pulcher</i>	33.3	0.0	0.1	0.2	0.2
Non-Vascular						
	Moss	33.3	33.3	0.1	0.2	0.2

***Leymus mollis* Herbaceous Alliance**



Common Name: Sea lyme grass patches

NVC Alliance Code: A2066. *Poa macrantha* - *Leymus mollis* - *Festuca rubra* Sand Dune Grassland Alliance

Statewide Description

Leymus mollis is dominant or characteristically present in the herbaceous layer with *Abronia latifolia*, *Achillea millefolium*, *Ambrosia chamissonis*, *Ammophila arenaria*, *Artemisia pycnocephala*, *Cakile* spp., *Calystegia soldanella*, *Carpobrotus chilensis*, *Lathyrus littoralis*, *Poa douglasii*, and *Poa macrantha*.

Because *Leymus mollis* is an obligate psammophyte, it thrives under conditions of active sand accretion of nearshore dunes and upper beaches (Pickart and Barbour 2007). *Leymus mollis* and *Abronia umbellata* ssp. *breviflora* (a CA rare plant with a rank of 1B.1) grow in the same habitat as the invasive non-native grass *Ammophila arenaria*, which has reduced and replaced these native species over much of their ranges in California. *Leymus mollis* stands fluctuate between being grass- and herb-dominated. They are generally small (< 0.5 ha) and patchy and intermix with stands of the *Abronia latifolia* – *Ambrosia chamissonis* Alliance.

Local Vegetation Description

The Sea lyme grass patches Alliance forms an intermittent to continuous herbaceous

layer. The shrub layer is open and the tree layer is absent. Dominant herbs include *Elymus mollis*, and characteristic herbs include *Ambrosia chamissonis*, *Cakile maritima*, and *Carpobrotus edulis*. Those herbs often present include *Abronia latifolia* and *Camissonia cheiranthifolia*, and herbs that are sometimes present include *Anagallis arvensis*, *Artemisia pycnocephala*, *Bromus diandrus*, *Castilleja latifolia*, *Distichlis spicata*, *Eriophyllum stoechadifolium*, *Fragaria chiloensis*, *Juncus lescurii*, *Plantago maritima*, *Poa douglasii*, *Sedum spathulifolium*, *Sonchus asper*, and *Sonchus oleraceus*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	2.8	0 – 10	0.3	0 – 0.5
Herb	53.8	45 – 70	0.4	0 – 1

Local Membership Rule

Leymus mollis dominates in the herbaceous layer. *Abronia*, *Ambrosia chamissonis*, *Artemisia pycnocephala*, *Cakile*, and other herbaceous species may be present as sub-dominants.

Local Environmental Description

Elevation: Mean 11 m, Range 7 – 19 m

Aspect: Flat (2), SE (2), SW (2), NE (1)

Slope: Mean 13 degrees, Range 1 – 41 degrees

Macro Topography: Upper 1/3 of slope (1), Bottom (1), Bottom to Lower 1/3 of slope (1), Lower 1/3 of slope (1), Lower to Middle 1/3 of slope (1), Middle to Upper 1/3 of slope (1), Ridge top (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 45.0%, Range 0.2 – 95.0%

Litter Cover: Mean 15.6%, Range 2.0 – 35%

Soil Texture (field assessed): Fine sand (2), Sand, (class unknown) (2)

Geology (field or map data): Sand dunes (4), Sandstone and other sedimentary (3)

San Mateo County Watersheds: Ano Nuevo (7)

Site Impacts

This alliance has low non-native plant cover (average 11.3%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Bromus diandrus*, *Cakile maritima*, *Carpobrotus edulis*, *Sonchus asper*, and *Sonchus oleraceus*.

Associations in San Mateo County

Leymus mollis Herbaceous Alliance

- *Leymus mollis* – *Abronia latifolia* – (*Cakile* sp.)

Classification Comments

Leymus mollis and *Elymus mollis* are synonymous.

References: Johnson 1963, Klein et al. 2015, LaBanca 1993, Parker 1974

Global Rarity Rank: G4

State Rarity Rank: S2

Surveys Used for Description

Total: N=7; San Mateo County (n=7): CORT010, CORT012, CORT169, SMAT0144, SMAT0168, SMATREL0145, SMATREL0170

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	42.9	38.9	2.0	1	8				
Herb	<i>Elymus mollis</i>	100.0	39.9	30.9	1	55	Y		Y	Y
	<i>Carpobrotus edulis</i>	100.0	5.7	4.7	0.2	11	Y			Y
	<i>Ambrosia chamissonis</i>	85.7	11.8	8.8	0.2	30	Y			Y
	<i>Cakile maritima</i>	85.7	3.2	1.8	0.2	10	Y			Y
	<i>Abronia latifolia</i>	71.4	11.2	7.0	1	20				Y
	<i>Camissonia cheiranthifolia</i>	57.1	3.6	2.1	0.2	12				Y
	<i>Poa douglasii</i>	42.9	6.0	3.6	0.2	20				
	<i>Distichlis spicata</i>	42.9	3.1	3.3	0.2	18				
	<i>Bromus diandrus</i>	42.9	0.9	0.6	0.2	2				
	<i>Sonchus asper</i>	42.9	0.5	0.3	0.2	1				
	<i>Artemisia pycnocephala</i>	28.6	4.0	3.7	10	16				
	<i>Fragaria chiloensis</i>	28.6	2.3	2.1	5	10				
	<i>Eriophyllum stoechadifolium</i>	28.6	1.3	1.2	0.2	8				
	<i>Castilleja latifolia</i>	28.6	0.6	0.6	1	3				
	<i>Plantago maritima</i>	28.6	0.6	0.3	0.2	2				
	<i>Sedum spathulifolium</i>	28.6	0.2	0.2	0.2	1				
	<i>Sonchus oleraceus</i>	28.6	0.1	0.1	0.2	0.2				
	<i>Anagallis arvensis</i>	28.6	0.1	0.1	0.2	0.2				
	<i>Juncus lescurii</i>	28.6	0.1	0.1	0.2	0.2				
Non-Vascular	Moss	28.6	28.6	0.1	0.2	0.2				

***Leymus mollis* – *Abronia latifolia* – (*Cakile* sp.) Association**

Common Name: Native Dunegrass – Coastal Sand-verbena – Sea Rocket

Patches

Alliance: *Leymus mollis* Herbaceous Alliance

Classification Comments

The association circumscription is the same as that of the alliance for the county. See above for detailed description.

References: Johnson 1963, Klein et al. 2015, LaBanca 1993, Parker 1974

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	42.9	38.9	2.0	1	8				
Herb	<i>Elymus mollis</i>	100.0	39.9	30.9	1	55			Y	Y
	<i>Carpobrotus edulis</i>	100.0	5.7	4.7	0.2	11				Y
	<i>Ambrosia chamissonis</i>	85.7	11.8	8.8	0.2	30				Y
	<i>Cakile maritima</i>	85.7	3.2	1.8	0.2	10				Y
	<i>Abronia latifolia</i>	71.4	11.2	7.0	1	20				Y
	<i>Camissonia cheiranthifolia</i>	57.1	3.6	2.1	0.2	12				Y
	<i>Poa douglasii</i>	42.9	6.0	3.6	0.2	20				
	<i>Distichlis spicata</i>	42.9	3.1	3.3	0.2	18				
	<i>Bromus diandrus</i>	42.9	0.9	0.6	0.2	2				
	<i>Sonchus asper</i>	42.9	0.5	0.3	0.2	1				
	<i>Artemisia pycnocephala</i>	28.6	4.0	3.7	10	16				
	<i>Fragaria chiloensis</i>	28.6	2.3	2.1	5	10				
	<i>Eriophyllum stoechadifolium</i>	28.6	1.3	1.2	0.2	8				
	<i>Castilleja latifolia</i>	28.6	0.6	0.6	1	3				
	<i>Plantago maritima</i>	28.6	0.6	0.3	0.2	2				
	<i>Sedum spathulifolium</i>	28.6	0.2	0.2	0.2	1				
	<i>Anagallis arvensis</i>	28.6	0.1	0.1	0.2	0.2				
	<i>Sonchus oleraceus</i>	28.6	0.1	0.1	0.2	0.2				
	<i>Juncus lescurii</i>	28.6	0.1	0.1	0.2	0.2				
Non-Vascular										

Moss

28.6 28.6 0.1 0.2 0.2

***Lolium perenne* Herbaceous Semi-Natural Alliance**



Common Name: Perennial rye grass fields

NVC Alliance Code: A3871. *Lolium perenne* Ruderal Grassland Alliance

Statewide Description

Lolium perenne is dominant or co-dominant with other non-natives in the herbaceous layer with *Agrostis stolonifera*, *Alopecurus aequalis*, *Asclepias fascicularis*, *Avena fatua*, *Brassica nigra*, *Bromus diandrus*, *Bromus hordeaceus*, *Centaureum muehlenbergii*, *Cirsium vulgare*, *Cryptantha flaccida*, *Euphorbia spathulata*, *Festuca arundinacea*, *Holcus lanatus*, *Hordeum brachyantherum*, *Hordeum marinum*, *Leontodon saxatilis*, *Leymus triticoides*, *Lotus corniculatus*, *Microseris douglasii*, *Nassella pulchra*, *Nasturtium officinale*, *Phalaris aquatica*, *Plantago erecta*, *Poa pratensis*, *Rumex crispus*, and *Trifolium* spp. Emergent trees and shrubs may be present at low cover.

Lolium perenne is a widespread and adaptable grass in cismontane California, and the plants grow in a wide range of soil types, except for those excessively drained. Many herbaceous alliances have significant cover of *L. perenne*, including stands of the *Eleocharis macrostachya*, *Juncus arcticus* (var. *balticus*, *mexicanus*), *Leymus triticoides*, *Muhlenbergia rigens*, *Plagiobothrys nothofulvus*, and *Trifolium variegatum* Alliances. While membership rules vary among studies, Sawyer et al. (2009) consider stands to be included in this type if *Lolium perenne* is a strong dominant, either alone or with other non-natives, largely to the exclusion of native plants. Generally, this type occurs in seasonally moist to wet environments that are regularly disturbed through grazing, fire, flooding, or mechanical means.

Local Vegetation Description

The Perennial rye grass fields Alliance forms a continuous herbaceous layer. The shrub layer is open and the tree layer is open. Characteristic herbs include *Bromus hordeaceus*, *Lolium perenne*, and *Plantago lanceolata*. Herbs often present include *Anagallis arvensis*, *Anthemis cotula*, *Avena* spp., *Bellardia trixago*, *Brachypodium distachyon*, *Briza minor*, *Bromus diandrus*, *Carduus pycnocephalus*, *Cirsium vulgare*, *Hordeum marinum*, *Lotus corniculatus*, *Medicago* spp., *Mentha pulegium*, *Phalaris aquatica*, *Rumex acetosella*, *Sisyrinchium bellum*, *Trifolium angustifolium*, *Trifolium dubium*, *Vicia sativa*, and *Vulpia bromoides*, and herbs that are sometimes present include *Centaureum tenuiflorum*, *Conium maculatum*, *Convolvulus arvensis*, *Cynosurus echinatus*, *Gastroidium phleoides*, *Geranium dissectum*, *Holcus lanatus*, *Hordeum murinum*, *Linum bienne*, *Linum usitatissimum*, *Madia sativa*, *Matricaria discoidea*, *Parentucellia viscosa*, *Picris echioides*, *Rumex pulcher*, *Rumex* spp., *Symphotrichum chilense*, *Taraxacum officinale*, *Trifolium* spp., *Vicia* spp., and *Vicia tetrasperma*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	4.0	0 – 8	10.0	5 – 15
Hardwood	1.5	1 – 2	3.5	2 – 5
Regenerating or Shrubby Tree	0.0	0.0 – 0.0	no data	no data
Shrub	3.5	1.0 – 6.0	0.8	0 – 2
Herb	97.0	95 – 99	0.3	0 – 0.5

Local Membership Rule

Lolium perenne dominates or co-dominates with *Avena* spp., *Bromus* spp., *Hordeum marinum*, *H. murinum*, *Medicago*, *Trifolium subterraneum*, *Elymus caput-medusae*, and other non-natives in the herbaceous layer. Native species are typically less than 10% relative cover. These invaded stands are often found on moist or poorly drained sites, on or off serpentine.

Local Environmental Description

Elevation: Mean 100 m, Range 60 – 170 m

Aspect: no data

Slope: no data

Macro Topography: no data

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 68.4%, Range 55.2

Litter Cover: Mean 31.6%, Range 18.7 – 44.8%

Soil Texture (field assessed): no data

Geology (field or map data): Sandstone and other sedimentary (4), Shale and other sedimentary (1)

San Mateo County Watersheds: Pescadero Creek (2), Ano Nuevo (1), San Mateo

Lolium perenne Herbaceous Semi-Natural Alliance

Bayside (1), Tunitas Creek (1)

Site Impacts

This alliance has greater cover of exotics than natives, non-native plant cover (average 91.6%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Anthemis cotula*, *Bellardia trixago*, *Brachypodium distachyon*, *Briza minor*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Centaureum tenuiflorum*, *Cirsium vulgare*, *Conium maculatum*, *Convolvulus arvensis*, *Cynosurus echinatus*, *Gastroidium phleoides*, *Geranium dissectum*, *Holcus lanatus*, *Hordeum marinum*, *Hordeum murinum*, *Linum bienne*, *Linum usitatissimum*, *Lotus corniculatus*, *Matricaria discoidea*, *Mentha pulegium*, *Parentucellia viscosa*, *Phalaris aquatica*, *Picris echioides*, *Plantago lanceolata*, *Rumex acetosella*, *Rumex pulcher*, *Taraxacum officinale*, *Trifolium angustifolium*, *Trifolium dubium*, *Vicia sativa*, *Vicia tetrasperma*, and *Vulpia bromoides*.

Associations in San Mateo County

- *Lolium perenne*
- *Lolium perenne* – *Lotus corniculatus*

Classification Comments

None.

References: Boul et al. 2021, Buck and Evens 2010, Buck-Diaz et al. 2011, Buck-Diaz et al. 2012, Buck-Diaz et al. 2013, Evens et al. 2004, Keeler-Wolf and Vaghti 2000, Klein et al. 2015, Pickart 2006, Sproul et al. 2011.

Global Rarity Rank: GNA **State Rarity Rank:** SNA

Surveys Used for Description

Total: N=6; San Mateo County (n=6): CLOV232A, PGA1804, PGA1852, PONU023, TOKA041, TOKA068

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	66.7	55.6	2.0	1	5				Y
Herb	<i>Lolium perenne</i>	100.0	24.3	23.7	12	55	Y			Y
	<i>Bromus hordeaceus</i>	83.3	13.5	13.1	2.8571	35	Y			Y
	<i>Plantago lanceolata</i>	83.3	7.1	7.2	0.2	15.714	Y			Y
	<i>Lotus corniculatus</i>	66.7	5.6	5.5	0.2	15.556				Y
	<i>Phalaris aquatica</i>	66.7	5.1	5.2	0.2	23.837				Y
	<i>Brachypodium distachyon</i>	66.7	4.3	4.3	0.2	10.952				Y

Lolium perenne Herbaceous Semi-Natural Alliance

<i>Avena spp.</i>	66.7	3.0	3.1	0.2	10	Y
<i>Briza minor</i>	66.7	0.8	0.8	0.5814	1.7778	Y
<i>Carduus pycnocephalus</i>	66.7	0.5	0.5	0.2	2.1834	Y
<i>Vulpia bromoides</i>	50.0	6.4	6.4	9.8837	17.333	Y
<i>Medicago spp.</i>	50.0	1.1	1.1	1.7442	2.8571	Y
<i>Hordeum marinum</i>	50.0	0.4	0.4	0.2	1.7442	Y
<i>Rumex acetosella</i>	50.0	0.4	0.4	0.2	1.9048	Y
<i>Anagallis arvensis</i>	50.0	0.4	0.4	0.2	1.7467	Y
<i>Bromus diandrus</i>	50.0	0.3	0.3	0.2	0.9524	Y
<i>Trifolium angustifolium</i>	50.0	0.2	0.2	0.2	0.5814	Y
<i>Anthemis cotula</i>	50.0	0.1	0.1	0.2	0.4762	Y
<i>Sisyrinchium bellum</i>	50.0	0.1	0.1	0.2	0.4444	Y
<i>Trifolium dubium</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Vicia sativa</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Mentha pulegium</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Bellardia trixago</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Cirsium vulgare</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Linum bienne</i>	33.3	11.1	12.2	3.4884	70	
<i>Linum usitatissimum</i>	33.3	2.7	2.7	6.5502	9.7778	
<i>Conium maculatum</i>	33.3	0.9	0.8	0.2	4.8035	
<i>Trifolium spp.</i>	33.3	0.6	0.6	0.2	3.3333	
<i>Madia sativa</i>	33.3	0.4	0.4	1.31	1.3333	
<i>Geranium dissectum</i>	33.3	0.4	0.4	0.8734	1.7442	
<i>Hordeum murinum</i>	33.3	0.4	0.4	0.2	2.3256	
<i>Vicia tetrasperma</i>	33.3	0.3	0.3	0.2	1.7442	
<i>Gastridium phleoides</i>	33.3	0.3	0.3	0.4762	1.3333	
<i>Taraxacum officinale</i>	33.3	0.3	0.3	0.2	1.3333	
<i>Vicia spp.</i>	33.3	0.2	0.2	0.4762	0.8734	
<i>Holcus lanatus</i>	33.3	0.2	0.2	0.2	0.8889	
<i>Parentucellia viscosa</i>	33.3	0.2	0.2	0.2	0.8734	
<i>Centaureum tenuiflorum</i>	33.3	0.2	0.2	0.2	0.8734	
<i>Cynosurus echinatus</i>	33.3	0.2	0.2	0.2	0.8734	
<i>Rumex spp.</i>	33.3	0.1	0.1	0.2	0.4367	
<i>Rumex pulcher</i>	33.3	0.1	0.1	0.2	0.2	
<i>Picris echioides</i>	33.3	0.1	0.1	0.2	0.2	
<i>Matricaria discoidea</i>	33.3	0.1	0.1	0.2	0.2	
<i>Convolvulus arvensis</i>	33.3	0.1	0.1	0.2	0.2	
<i>Symphotrichum chilense</i>	33.3	0.1	0.1	0.2	0.2	

***Lolium perenne* Semi-natural Association**

Common Name: Italian Ryegrass Patches

Alliance: *Lolium perenne* Herbaceous Semi-Natural Alliance

Local Vegetation Description

The Italian Ryegrass Association forms a continuous herbaceous layer. The shrub layer is sparse and the tree layer is sparse. Dominant herbs include *Lolium perenne*. Those herbs often present include *Hordeum murinum*, and herbs that are sometimes present include *Achillea millefolium*, *Amsinckia* spp., *Avena* spp., *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Erodium cicutarium*, *Eschscholzia californica*, *Nassella pulchra*, *Plantago erecta*, *Rumex acetosella*, *Silybum marianum*, *Trifolium subterraneum*, and *Vicia sativa*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.5	0 – 1.0	3.5	2 – 5
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.5	0 – 1.0	0.3	0 – 0.5
Herb	95.5	92 – 99	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 197 m, Range 75 – 118 m

Aspect: no data

Slope: no data

Macro Topography: no data

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: 69.7%

Litter Cover: 30.3%

Soil Texture (field assessed): no data

Geology (field or map data): Sandstone and other sedimentary (1), Shale and other sedimentary (1)

San Mateo County Watersheds: Ano Nuevo (1), San Mateo Bayside (1)

Site Impacts

This association has greater cover of non-native (average 95.7%) than native. Non-native species that occur with highest frequency and abundance include *Avena* spp., *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Erodium cicutarium*, *Hordeum murinum*, *Lolium perenne*, *Rumex acetosella*, *Silybum marianum*, *Trifolium subterraneum*, and *Vicia sativa*.

Lolium perenne Semi-natural Association
Lolium perenne Herbaceous Semi-Natural Alliance

Classification Comments

None.

References: Buck-Diaz et al. 2011, Buck-Diaz et al. 2012, Buck-Diaz et al. 2013, Keeler-Wolf and Vaghti 2000, Klein et al. 2015, Pickart 2006, Sproul et al. 2011

Global Rarity Rank: GNA

State Rarity Rank: SNA

State Rare: N

Surveys Used for Description

Total: N=2; San Mateo County (n=2): CLOV232A, PGA1852

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Eucalyptus globulus</i>	50.0	50.0	0.5	1	1				Y
Shrub	<i>Baccharis pilularis</i>	50.0	50.0	0.5	1	1				Y
Herb	<i>Lolium perenne</i>	100.0	36.1	33.9	12.791	55			Y	Y
	<i>Bromus hordeaceus</i>	100.0	32.4	31.2	27.326	35			Y	Y
	<i>Phalaris aquatica</i>	50.0	11.6	11.9	23.837	23.837				Y
	<i>Vulpia bromoides</i>	50.0	4.8	4.9	9.8837	9.8837				Y
	<i>unknown Poaceae</i>	50.0	2.3	2.3	4.6512	4.6512				Y
	<i>Linum bienne</i>	50.0	1.7	1.7	3.4884	3.4884				Y
	<i>Avena spp.</i>	50.0	1.1	1.2	2.3256	2.3256				Y
	<i>Hordeum murinum</i>	50.0	1.1	1.2	2.3256	2.3256				Y
	<i>Elymus glaucus</i>	50.0	1.1	1.0	2	2				Y
	<i>Geranium dissectum</i>	50.0	0.9	0.9	1.7442	1.7442				Y
	<i>Medicago spp.</i>	50.0	0.9	0.9	1.7442	1.7442				Y
	<i>Hordeum marinum</i>	50.0	0.9	0.9	1.7442	1.7442				Y
	<i>Vicia tetrasperma</i>	50.0	0.9	0.9	1.7442	1.7442				Y
	<i>Malva spp.</i>	50.0	0.3	0.3	0.5814	0.5814				Y
	<i>Trifolium subterraneum</i>	50.0	0.3	0.3	0.5814	0.5814				Y
	<i>Briza minor</i>	50.0	0.3	0.3	0.5814	0.5814				Y
	<i>Trifolium angustifolium</i>	50.0	0.3	0.3	0.5814	0.5814				Y
	<i>Bromus diandrus</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Matricaria discoidea</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Hypochaeris radicata</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Lotus corniculatus</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Trifolium dubium</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Juncus patens</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Nassella pulchra</i>	50.0	0.1	0.1	0.2	0.2				Y

Lolium perenne Semi-natural Association
Lolium perenne Herbaceous Semi-Natural Alliance

<i>Coronopus didymus</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Cirsium vulgare</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Brachypodium distachyon</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Convolvulus arvensis</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Centaureum davyi</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Conium maculatum</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Vicia sativa</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Anagallis arvensis</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Cynosurus echinatus</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Trifolium fragiferum</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Trifolium spp.</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Sonchus asper</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Aira caryophyllea</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Mentha pulegium</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Holcus lanatus</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Myosotis discolor</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Erodium moschatum</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Silybum marianum</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Rumex crispus</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Rumex acetosella</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Plantago lanceolata</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Plantago coronopus</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Picris echioides</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Anthemis cotula</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Parentucellia viscosa</i>	50.0	0.1	0.1	0.2	0.2	Y
Non-Vascular						
Lichen	50	25.0	0.1	0.2	0.2	
Moss	50	25.0	0.1	0.2	0.2	

***Lolium perenne* – *Lotus corniculatus* Semi-natural Association**

Common Name: Italian Ryegrass – Bird's Foot Trefoil Patches

Alliance: *Lolium perenne* Herbaceous Semi-Natural Alliance

Local Vegetation Description

The Italian Ryegrass – Bird's Foot Trefoil Association forms a continuous herbaceous layer. The shrub layer is open and the tree layer is absent. Characteristic herbs include *Anagallis arvensis*, *Bellardia trixago*, *Brachypodium distachyon*, *Briza minor*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Hordeum marinum*, *Lolium perenne*, *Lotus corniculatus*, *Medicago* spp., *Phalaris aquatica*, *Plantago lanceolata*, *Sisyrinchium bellum*, *Symphotrichum chilense*, and *Trifolium dubium*. Those herbs often present include *Anthemis cotula*, *Avena* spp., *Bromus diandrus*, *Centaureum tenuiflorum*, *Cirsium vulgare*, *Gastroidium phleoides*, *Linum usitatissimum*, *Madia sativa*, *Rumex* spp., *Rumex acetosella*, *Rumex pulcher*, *Taraxacum officinale*, *Trifolium angustifolium*, *Vicia* spp., *Vicia sativa*, and *Vulpia bromoides*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	3.0	0.9 – 6.0	no data	no data
Herb	98.6	97.1 – 100	no data	no data

Local Environmental Description

Elevation: Mean 102 m, Range 60 – 170 m Aspect: no data

Slope: no data

Macro Topography: no data

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 68.0%, Range 55.2 – 81.3%

Litter Cover: Mean 32.0%, Range 18.7 – 44.7%

Soil Texture (field assessed): no data

Geology (field or map data): Sandstone and other sedimentary (3)

San Mateo County Watersheds: Pescadero Creek (2), Tunitas Creek (1)

Site Impacts

This association has greater cover of non-native (average 89.2%) than native. Non-native species that occur with highest frequency and abundance include *Anagallis*

Lolium perenne – *Lotus corniculatus* Semi-natural Association
Lolium perenne Herbaceous Semi-Natural Alliance

arvensis, *Anthemis cotula*, *Avena* spp., *Bellardia trixago*, *Brachypodium distachyon*, *Briza minor*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Centaureum tenuiflorum*, *Gastridium phleoides*, *Hordeum marinum*, *Linum usitatissimum*, *Lolium perenne*, *Lotus corniculatus*, *Medicago* spp., *Phalaris aquatica*, *Plantago lanceolata*, *Rumex acetosella*, *Taraxacum officinale*, *Trifolium angustifolium*, and *Vulpia bromoides*.

Classification Comments

None.

References: Boul et al. 2021, Keeler-Wolf and Vaghti 2000, Pickart 2006

Global Rarity Rank: GNA

State Rarity Rank: SNA

State Rare: N

Surveys Used for Description

Total: N=3; San Mateo County (n=3): PONU023, TOKA041, TOKA068

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	66.7	61.1	2.3	2	5				Y
	<i>Toxicodendron diversilobum</i>	33.3	16.7	0.1	0.4367	0.4367				
	<i>Santolina chamaecyparissus</i>	33.3	16.7	0.1	0.4367	0.4367				
	<i>Rubus ursinus</i>	33.3	5.6	0.3	1	1				
Herb	<i>Lolium perenne</i>	100.0	18.4	18.1	12	25.714				Y
	<i>Lotus corniculatus</i>	100.0	11.1	11.0	5.7143	15.556				Y
	<i>Plantago lanceolata</i>	100.0	11.1	11.0	5.2402	15.714				Y
	<i>Brachypodium distachyon</i>	100.0	8.6	8.5	5.2402	10.952				Y
	<i>Bromus hordeaceus</i>	100.0	5.4	5.4	2.8571	7.8603				Y
	<i>Phalaris aquatica</i>	100.0	2.5	2.4	0.2	6.5502				Y
	<i>Briza minor</i>	100.0	1.4	1.4	0.8734	1.7778				Y
	<i>Carduus pycnocephalus</i>	100.0	0.9	0.9	0.2	2.1834				Y
	<i>Sisyrinchium bellum</i>	100.0	0.3	0.3	0.2	0.4444				Y
	<i>Bellardia trixago</i>	100.0	0.2	0.2	0.2	0.2				Y
	<i>Vulpia bromoides</i>	66.7	9.6	9.6	11.354	17.333				Y
	<i>Linum usitatissimum</i>	66.7	5.5	5.4	6.5502	9.7778				Y
	<i>Avena</i> spp.	66.7	2.2	2.1	0.2	6.1905				Y
	<i>Medicago</i> spp.	66.7	1.6	1.5	1.7467	2.8571				Y

Lolium perenne – *Lotus corniculatus* Semi-natural Association
Lolium perenne Herbaceous Semi-Natural Alliance

<i>Madia sativa</i>	66.7	0.9	0.9	1.31	1.3333	Y
<i>Rumex acetosella</i>	66.7	0.7	0.7	0.2	1.9048	Y
<i>Anagallis arvensis</i>	66.7	0.7	0.6	0.2	1.7467	Y
<i>Gastridium phleoides</i>	66.7	0.6	0.6	0.4762	1.3333	Y
<i>Taraxacum officinale</i>	66.7	0.5	0.5	0.2	1.3333	Y
<i>Bromus diandrus</i>	66.7	0.5	0.5	0.4367	0.9524	Y
<i>Vicia spp.</i>	66.7	0.5	0.4	0.4762	0.8734	Y
<i>Centaureum tenuiflorum</i>	66.7	0.4	0.4	0.2	0.8734	Y
<i>Anthemis cotula</i>	66.7	0.2	0.2	0.2	0.4762	Y
<i>Trifolium angustifolium</i>	66.7	0.2	0.2	0.2	0.4762	Y
<i>Hordeum marinum</i>	66.7	0.2	0.2	0.2	0.4367	Y
<i>Rumex spp.</i>	66.7	0.2	0.2	0.2	0.4367	Y
<i>Vicia sativa</i>	66.7	0.1	0.1	0.2	0.2	Y
<i>Rumex pulcher</i>	66.7	0.1	0.1	0.2	0.2	Y
<i>Trifolium dubium</i>	66.7	0.1	0.1	0.2	0.2	Y
<i>Cirsium vulgare</i>	66.7	0.1	0.1	0.2	0.2	Y
<i>Symphotrichum chilense</i>	66.7	0.1	0.1	0.2	0.2	Y
<i>Vulpia myuros</i>	33.3	5.0	4.9	14.762	14.762	
<i>Elymus triticoides</i>	33.3	2.2	2.2	6.6667	6.6667	
<i>Conium maculatum</i>	33.3	1.6	1.6	4.8035	4.8035	
<i>Trifolium spp.</i>	33.3	1.1	1.1	3.3333	3.3333	
<i>Calystegia spp.</i>	33.3	0.9	0.9	2.6667	2.6667	
<i>Bromus carinatus</i>	33.3	0.4	0.4	1.31	1.31	
unknown Asteraceae	33.3	0.3	0.3	0.8734	0.8734	
<i>Juncus spp.</i>	33.3	0.3	0.3	0.8734	0.8734	
<i>Parentucellia viscosa</i>	33.3	0.3	0.3	0.8734	0.8734	
<i>Cynosurus echinatus</i>	33.3	0.3	0.3	0.8734	0.8734	
<i>Geranium dissectum</i>	33.3	0.3	0.3	0.8734	0.8734	
<i>Galium spp.</i>	33.3	0.3	0.3	0.8734	0.8734	
<i>Holcus lanatus</i>	33.3	0.3	0.3	0.8889	0.8889	
<i>Euphorbia spp.</i>	33.3	0.2	0.2	0.4762	0.4762	
<i>Sarcocornia pacifica</i>	33.3	0.1	0.1	0.4367	0.4367	
<i>Artemisia douglasiana</i>	33.3	0.1	0.1	0.4367	0.4367	
<i>Achillea millefolium</i>	33.3	0.1	0.1	0.2	0.2	
<i>Matricaria discoidea</i>	33.3	0.1	0.1	0.2	0.2	
<i>Lactuca serriola</i>	33.3	0.1	0.1	0.2	0.2	
<i>Verbena lasiostachys</i>	33.3	0.1	0.1	0.2	0.2	
<i>Clinopodium douglasii</i>	33.3	0.1	0.1	0.2	0.2	
<i>Silene gallica</i>	33.3	0.1	0.1	0.2	0.2	
<i>Hordeum murinum</i>	33.3	0.1	0.1	0.2	0.2	
<i>Raphanus sativus</i>	33.3	0.1	0.1	0.2	0.2	
<i>Vicia tetrasperma</i>	33.3	0.1	0.1	0.2	0.2	
<i>Convolvulus arvensis</i>	33.3	0.1	0.1	0.2	0.2	
<i>Danthonia californica</i>	33.3	0.1	0.1	0.2	0.2	
<i>Logfia gallica</i>	33.3	0.1	0.1	0.2	0.2	
<i>Dipsacus spp.</i>	33.3	0.1	0.1	0.2	0.2	

Lolium perenne – *Lotus corniculatus* Semi-natural Association
Lolium perenne Herbaceous Semi-Natural Alliance

<i>Picris echioides</i>	33.3	0.1	0.1	0.2	0.2
<i>Navarretia spp.</i>	33.3	0.1	0.1	0.2	0.2
<i>Mentha pulegium</i>	33.3	0.1	0.1	0.2	0.2

Mesembryanthemum spp. – Carpobrotus spp. Herbaceous Semi-Natural Alliance



Common Name: Ice plant mats

NVC Alliance Code: A1620. *Mesembryanthemum* spp. - *Carpobrotus* spp. Ruderal Grassland Alliance

Statewide Description

Carpobrotus chilensis, *C. edulis*, *Mesembryanthemum*, or other ice plant taxa are dominant in the herbaceous layer. At least eight invasive ice plant taxa grow in California: *Aptenia cordifolia*, *Carpobrotus edulis*, *C. chilensis*, *Conicosia pugioniformis*, *Drosanthemum floribundum*, *Malephora crocea*, *Mesembryanthemum crystallinum*, and *M. nodiflorum*.

Carpobrotus edulis is a ground-hugging succulent perennial that forms impenetrable mats covering large areas. This ice plant has been widely planted for soil stabilization and landscaping. The success of *C. edulis* is due particularly to its tolerance of a wide range of soil moisture and nutrient conditions, and to its dispersal by mammals (D'Antonio 1993). This species is often confused with *C. chilensis*, a smaller, less aggressive ice plant with magenta flowers. The two species hybridize, and the hybrids are invasive as well.

Aptenia cordifolia grows in disturbed places and on the margins of coastal wetlands (Kitz 2000a). *Conicosia pugioniformis*, a short-lived succulent, has narrow leaves and

does not form clonal mats. It is most abundant in open patches on dunes and in recently disturbed areas (Albert and D'Antonio 2000). The uncommon *Drosanthemum floribundum* is a mat-forming shrub. *Malephora crocea* is a prostrate shrub with linear leaves, common in coastal southern California (DiTomaso and Healy 2007). *Mesembryanthemum crystallinum* and *M. nodiflorum* invade coastal bluffs and interior alkaline wetlands in southern California (Randall 2000).

Local Vegetation Description

The Ice plant mats Alliance forms an intermittent to continuous herbaceous layer. The shrub layer is sparse and the tree layer is absent. Dominant herbs include *Carpobrotus edulis*. Those herbs often present include *Ambrosia chamissonis*, *Eriogonum latifolium*, *Eriophyllum stoechadifolium*, and *Galium aparine*, and herbs that are sometimes present include *Abronia latifolia*, *Achillea millefolium*, *Armeria maritima*, *Artemisia pycnocephala*, *Bromus carinatus*, *Bromus diandrus*, *Bromus hordeaceus*, *Bromus maritimus*, *Cakile maritima*, *Camissonia cheiranthifolia*, *Camissonia* spp., *Cardamine oligosperma*, *Claytonia perfoliata*, *Daucus pusillus*, *Elymus mollis*, *Erigeron glaucus*, *Eschscholzia californica*, *Fragaria chiloensis*, *Hirschfeldia incana*, *Lasthenia californica*, *Marah oreganus*, *Medicago* spp., *Nassella pulchra*, *Plantago coronopus*, *Polygonum paronychia*, *Raphanus sativus*, *Sonchus asper*, *Spergularia maritima*, and *Stellaria media*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	1.3	0 – 5	0.5	0 – 1
Herb	81.3	50 – 95	0.3	0 – 0.5

Local Membership Rule

Carpobrotus and/or *Mesembryanthemum* dominate on bluffs, dunes, or disturbed lands, often forming impenetrable mats that prevent natives from establishing.

Local Environmental Description

Elevation: Mean 41 m, Range 8 – 125 m

Aspect: SW (2)

Slope: Mean 2 degrees, Range 1 – 3 degrees

Macro Topography: Bottom to Lower 1/3 of slope (1), Lower 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: 5.0%

Litter Cover: Mean 92.0%, Range 90.0 – 94%

Soil Texture (field assessed): Medium to very fine, sandy loam (1), Sand, (class unknown) (1)

Mesembryanthemum spp. – *Carpobrotus* spp. Herbaceous Semi-Natural Alliance

Geology (field or map data): Sandstone (1), Sandstone and other sedimentary (1), Volcanic and metavolcanic rocks (1), Sand dunes (1)

San Mateo County Watersheds: San Francisco Coastal (2), Ano Nuevo (1), Pacifica (1)

Site Impacts

This alliance has greater cover of exotics than natives, non-native plant cover (average 95.4%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Bromus diandrus*, *Bromus hordeaceus*, *Cakile maritima*, *Carpobrotus edulis*, *Hirschfeldia incana*, *Plantago coronopus*, *Raphanus sativus*, *Sonchus asper*, *Spergularia maritima*, and *Stellaria media*.

Associations in San Mateo County

- *Carpobrotus (edulis)*

Classification Comments

None.

References: HDR 2014b, Keeler-Wolf and Evens 2006, Klein et al. 2015, Verdone and Evens 2010

Global Rarity Rank: GNA **State Rarity Rank:** SNA

Surveys Used for Description

Total: N=4; San Mateo County (n=4): PGA10901, PGA1751, SMAT0008, SMAT0101

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	50.0	13.8	0.6	0.2	2				Y
	<i>Eriophyllum confertiflorum</i>	25.0	14.4	0.8	3	3				
	<i>Lupinus arboreus</i>	25.0	20.8	0.3	1	1				
	<i>Lupinus versicolor</i>	25.0	25.0	0.1	0.2	0.2				
	<i>Rubus ursinus</i>	25.0	1.0	0.1	0.2	0.2				
	<i>Lupinus chamissonis</i>	25.0	25.0	0.1	0.2	0.2				
	Herb	<i>Carpobrotus edulis</i>	100.0	96.5	80.0	50	94	Y	Y	
<i>Eriogonum latifolium</i>		50.0	0.3	0.3	0.2	1				Y
<i>Galium aparine</i>		50.0	0.1	0.1	0.2	0.2				Y
<i>Ambrosia chamissonis</i>		50.0	0.1	0.1	0.2	0.2				Y
<i>Eriophyllum stoechadifolium</i>		50.0	0.1	0.1	0.2	0.2				Y

Mesembryanthemum spp. – *Carpobrotus* spp. Herbaceous Semi-Natural Alliance

<i>Nassella pulchra</i>	25.0	0.8	0.8	3	3
<i>Lasthenia californica</i>	25.0	0.3	0.3	1	1
<i>Bromus carinatus</i>	25.0	0.3	0.3	1	1
<i>Cardamine oligosperma</i>	25.0	0.1	0.1	0.2	0.2
<i>Camissonia spp.</i>	25.0	0.1	0.1	0.2	0.2
<i>Cakile maritima</i>	25.0	0.1	0.1	0.2	0.2
<i>Camissonia cheiranthifolia</i>	25.0	0.1	0.1	0.2	0.2
<i>Bromus maritimus</i>	25.0	0.1	0.1	0.2	0.2
<i>Claytonia perfoliata</i>	25.0	0.1	0.1	0.2	0.2
<i>Bromus diandrus</i>	25.0	0.1	0.1	0.2	0.2
<i>Achillea millefolium</i>	25.0	0.1	0.1	0.2	0.2
<i>Artemisia pycnocephala</i>	25.0	0.1	0.1	0.2	0.2
<i>Armeria maritima</i>	25.0	0.1	0.1	0.2	0.2
<i>Abronia latifolia</i>	25.0	0.1	0.1	0.2	0.2
<i>Raphanus sativus</i>	25.0	0.1	0.1	0.2	0.2
<i>Bromus hordeaceus</i>	25.0	0.1	0.1	0.2	0.2
<i>Hirschfeldia incana</i>	25.0	0.1	0.1	0.2	0.2
<i>Daucus pusillus</i>	25.0	0.1	0.1	0.2	0.2
<i>unknown Poaceae</i>	25.0	0.1	0.1	0.2	0.2
<i>Polygonum paronychia</i>	25.0	0.1	0.1	0.2	0.2
<i>Plantago coronopus</i>	25.0	0.1	0.1	0.2	0.2
<i>Marah oreganus</i>	25.0	0.1	0.1	0.2	0.2
<i>Sonchus asper</i>	25.0	0.1	0.1	0.2	0.2
<i>Fragaria chiloensis</i>	25.0	0.1	0.1	0.2	0.2
<i>Eschscholzia californica</i>	25.0	0.1	0.1	0.2	0.2
<i>Erigeron glaucus</i>	25.0	0.1	0.1	0.2	0.2
<i>Spergularia maritima</i>	25.0	0.1	0.1	0.2	0.2
<i>Stellaria media</i>	25.0	0.1	0.1	0.2	0.2
<i>Elymus mollis</i>	25.0	0.1	0.1	0.2	0.2
<i>Medicago spp.</i>	25.0	0.1	0.1	0.2	0.2

***Carpobrotus (edulis)* Semi-natural Association**

Common Name: Iceplant Patches

Alliance: *Mesembryanthemum* spp. – *Carpobrotus* spp. Herbaceous Semi-Natural Alliance

Classification Comments

The association circumscription is the same as that of the alliance. See above for detailed description. **References:** HDR 2014b, Keeler-Wolf and Evens 2006, Klein et al. 2015, Verdone and Evens 2010

Global Rarity Rank: GNA

State Rarity Rank: SNA

State Rare: N

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	50.0	13.8	0.6	0.2	2				Y
	<i>Lupinus versicolor</i>	25.0	25.0	0.1	0.2	0.2				
	<i>Lupinus chamissonis</i>	25.0	25.0	0.1	0.2	0.2				
	<i>Lupinus arboreus</i>	25.0	20.8	0.3	1	1				
	<i>Eriophyllum confertiflorum</i>	25.0	14.4	0.8	3	3				
	<i>Rubus ursinus</i>	25.0	1.0	0.1	0.2	0.2				
	Herb	<i>Carpobrotus edulis</i>	100.0	96.5	80.0	50	94		Y	
<i>Eriogonum latifolium</i>		50.0	0.3	0.3	0.2	1				Y
<i>Galium aparine</i>		50.0	0.1	0.1	0.2	0.2				Y
<i>Eriophyllum stoechadifolium</i>		50.0	0.1	0.1	0.2	0.2				Y
<i>Ambrosia chamissonis</i>		50.0	0.1	0.1	0.2	0.2				Y
<i>Nassella pulchra</i>		25.0	0.8	0.8	3	3				
<i>Lasthenia californica</i>		25.0	0.3	0.3	1	1				
<i>Bromus carinatus</i>		25.0	0.3	0.3	1	1				
<i>Camissonia</i> spp.		25.0	0.1	0.1	0.2	0.2				
<i>Erigeron glaucus</i>		25.0	0.1	0.1	0.2	0.2				
<i>Bromus hordeaceus</i>		25.0	0.1	0.1	0.2	0.2				
<i>Bromus diandrus</i>		25.0	0.1	0.1	0.2	0.2				
<i>Daucus pusillus</i>		25.0	0.1	0.1	0.2	0.2				
<i>Armeria maritima</i>		25.0	0.1	0.1	0.2	0.2				
unknown Poaceae	25.0	0.1	0.1	0.2	0.2					

Mesembryanthemum spp. – *Carpobrotus* spp. Herbaceous Semi-Natural Alliance

<i>Bromus maritimus</i>	25.0	0.1	0.1	0.2	0.2
<i>Polygonum paronychia</i>	25.0	0.1	0.1	0.2	0.2
<i>Raphanus sativus</i>	25.0	0.1	0.1	0.2	0.2
<i>Plantago coronopus</i>	25.0	0.1	0.1	0.2	0.2
<i>Medicago spp.</i>	25.0	0.1	0.1	0.2	0.2
<i>Spergularia maritima</i>	25.0	0.1	0.1	0.2	0.2
<i>Eschscholzia californica</i>	25.0	0.1	0.1	0.2	0.2
<i>Elymus mollis</i>	25.0	0.1	0.1	0.2	0.2
<i>Claytonia perfoliata</i>	25.0	0.1	0.1	0.2	0.2
<i>Cardamine oligosperma</i>	25.0	0.1	0.1	0.2	0.2
<i>Fragaria chiloensis</i>	25.0	0.1	0.1	0.2	0.2
<i>Hirschfeldia incana</i>	25.0	0.1	0.1	0.2	0.2
<i>Camissonia cheiranthifolia</i>	25.0	0.1	0.1	0.2	0.2
<i>Marah oreganus</i>	25.0	0.1	0.1	0.2	0.2
<i>Artemisia pycnocephala</i>	25.0	0.1	0.1	0.2	0.2
<i>Cakile maritima</i>	25.0	0.1	0.1	0.2	0.2
<i>Abronia latifolia</i>	25.0	0.1	0.1	0.2	0.2
<i>Stellaria media</i>	25.0	0.1	0.1	0.2	0.2
<i>Sonchus asper</i>	25.0	0.1	0.1	0.2	0.2
<i>Achillea millefolium</i>	25.0	0.1	0.1	0.2	0.2

***Mimulus (guttatus)* Herbaceous Alliance**



Common Name: Common monkey flower seeps
NVC Alliance Code: N/A.

Statewide Description

Mimulus guttatus, other wetland *Mimulus* species, or various wetland forbs such as *Cirsium* and *Stachys* species may be dominant or characteristically present in the herbaceous layer with *Bromus diandrus*, *Bromus hordeaceus*, *Carex* spp., *Equisetum arvense*, *Juncus* spp., *Lactuca serriola*, *Lotus purshianus*, *Melilotus indicus*, *Pentagramma triangularis*, *Poa tenerrima*, *Rumex crispus*, *Sonchus asper*, *Trifolium microcephalum*, *Triteleia hyacinthina*, and *Vulpia microstachys*. Emergent shrubs may be present at low cover, including *Baccharis salicifolia* or *Ceanothus cuneatus*.

The *Mimulus (guttatus)* Alliance often forms stands within the splash zone of small first-order streams, seeps, springs, and hanging gardens. Stands often occur as small patches or in narrow linear strips, occasionally broadening into small hollows. Some stands are found on very steep cascades and waterfalls, or along gentle streams. The floristic composition of stands is variable. As currently understood, the alliance includes stands with *Mimulus guttatus* or related lower-elevation *Mimulus* spp. characteristically present. Stands sometimes occur in mesic upland areas that quickly dry by mid to late spring; they are not usually on flats or in swales, unlike stands of the vernal pool alliances.

Local Vegetation Description

The Common monkey flower seeps Alliance forms an open to continuous herbaceous layer. The shrub layer is sparse to open and the tree layer is sparse. Characteristic herbs include *Cirsium fontinale*, *Lolium perenne*, and *Mimulus guttatus*. Herbs often present include *Achillea millefolium*, *Carex serratodens*, *Hemizonia congesta*, *Hordeum brachyantherum*, *Juncus xiphioides*, *Lactuca saligna*, *Polypogon monspeliensis*, and *Polypogon viridis*, and herbs that are sometimes present include *Avena* spp., *Bromus hordeaceus*, *Elymus triticoides*, *Eschscholzia californica*, *Lessingia* spp., *Nassella pulchra*, and *Scrophularia californica*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.7	0 – 5	no data	no data
Regenerating or Shrubby Tree	0.1	0 – 1.2	1.5	1 – 2
Shrub	1.8	0 – 8	1.7	0.5 – 5
Herb	40.7	10 – 78	0.7	0 – 2

Local Membership Rule

Mimulus guttatus or another wetland *Mimulus* species dominates or co-dominates in the herbaceous layer with *Cirsium* and *Juncus* spp. or non-native grasses such as *Lolium perenne* and *Polypogon monspeliensis*. Stands are found in moist or saturated settings along streams, ephemeral cascades, ditches, fens, seeps, and springs often with high cover of moss.

Local Environmental Description

Elevation: Mean 203 m, Range 17 – 360 m

Aspect: SW (14), SE (6), Flat (1), NE (1), NW (1), S (1)

Slope: Mean 13 degrees, Range 0 – 60 degrees

Macro Topography: Draw (7), Middle 1/3 of slope (7), Basin/Wetland (5), Bottom (2), Bottom to Mid 1/3 of slope (1), Lower 1/3 of slope (1), Lower to Middle 1/3 of slope (1)

Large Rock: Mean 6.4%, Range 0.0 – 36.0%

Small Rock: Mean 12.8%, Range 0.0 – 55.0%

Fines Cover: Mean 33.0%, Range 0.0 – 82.0%

Litter Cover: Mean 16.6%, Range 0.0 – 90%

Soil Texture (field assessed): Fine silty clay (5), Medium to very fine, sandy loam (4), Moderately fine sandy clay loam (3), Moderately fine silty clay loam (2), Moderately fine clay loam (2), Moderately coarse, sandy loam (2), Medium silt (1), Unknown (1), Fine sandy clay (1), Coarse, loamy sand (1)

Geology (field or map data): Serpentine (22), Granitic (generic) (1), Ultramafic (type unknown) (1)

San Mateo County Watersheds: San Mateo Bayside (2), Pacifica (1)

Other Watersheds, Marin Co.: Petaluma River (1); **San Francisco Co.:** ; **Santa Clara**

Co.: Coyote Creek (20); Santa Cruz Co.:

Site Impacts

This alliance has moderate non-native plant cover (average 25.7%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Bromus hordeaceus*, *Lactuca saligna*, *Polypogon monspeliensis*, and *Polypogon viridis*.

Associations in San Mateo County

- *Cirsium fontinales*
- *Mimulus guttatus*

Classification Comments

This Alliance has been revised to include other wetland forbs and *Mimulus* spp. that occur in lower elevation wetland seeps, springs, and streams to better align with the NVC. The name of the alliance is likely to change upon additional peer review of the NVC. Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: Cooper and Wolf 2006, Evens and San 2004, Klein et al. 2015, VegCAMP 2015a

Global Rarity Rank: G4? **State Rarity Rank:** S3?

Surveys Used for Description

Total: N=24; San Mateo County (n=3): SMAT0150, SMAT0271, SMATREL0206

Marin County (n=1): MARIN236

Santa Clara County (n=20): COYO011, COYO074, COYO075, COYO076, COYO077, COYO078, COYO079, COYO080, COYO081, COYO082, COYO083, COYO085, COYO087, COYO089, SCLAR006, SCLAR052, SCLAR085, SCLAR138, SCLAR139, SCLAR140

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Frangula californica</i>	45.8	36.8	1.0	0.1	8				
Herb	<i>Cirsium fontinale</i>	91.7	42.3	19.4	3	70	Y		Y	Y
	<i>Mimulus guttatus</i>	83.3	5.5	2.9	0.1	20	Y			Y
	<i>Lolium perenne</i>	79.2	14.9	6.8	0.1	45	Y			Y
	<i>Hemizonia congesta</i>	70.8	2.6	0.8	0.1	5				Y
	<i>Juncus xiphioides</i>	62.5	2.7	0.8	0.1	4				Y

Mimulus (guttatus) Herbaceous Alliance

<i>Lactuca saligna</i>	62.5	0.6	0.3	0.1	4	Y
<i>Carex serratodens</i>	58.3	4.6	1.6	0.1	7	Y
<i>Polypogon monspeliensis</i>	58.3	2.0	1.0	0.1	20	Y
<i>Achillea millefolium</i>	58.3	0.5	0.2	0.1	1	Y
<i>Hordeum brachyantherum</i>	54.2	0.7	0.3	0.1	2	Y
<i>Polypogon viridis</i>	50.0	3.7	1.5	0.1	10	Y
<i>Eschscholzia californica</i>	45.8	0.7	0.3	0.1	3	
<i>Nassella pulchra</i>	37.5	0.7	0.3	0.1	3	
<i>Elymus triticoides</i>	29.2	0.8	0.3	0.1	5	
<i>Lessingia spp.</i>	29.2	0.2	0.1	0.1	1	
<i>Bromus hordeaceus</i>	25.0	0.5	0.3	0.1	2	
<i>Avena spp.</i>	20.8	0.3	0.1	0.1	2	
<i>Scrophularia californica</i>	20.8	0.1	0.0	0.1	0.2	
Non-Vascular						
Moss	33.3	20.6	0.6	0.1	8	
Lichen	25.0	9.6	0.1	0.1	1	
Algae	20.8	11.4	0.4	0.1	5	

***Cirsium fontinale* Provisional Association**

Common Name: Mt. Hamilton Thistle Patches

Alliance: *Mimulus (guttatus)* Herbaceous Alliance

Local Vegetation Description

The Mt. Hamilton Thistle Association forms a continuous herbaceous layer. The shrub layer is open and the tree layer is absent. Co-dominant herbs include *Calamagrostis nutkaensis* and *Cirsium fontinale*, and characteristic herbs include, *Chlorogalum pomeridianum*, *Elymus triticoides*, *Juncus arcticus*, *Lactuca saligna*, and *Mimulus guttatus*. Those herbs often present include *Agrostis avenacea*, *Carex serratodens*, *Cortaderia jubata*, *Dipsacus* spp., *Picris echioides*, *Polypogon monspeliensis*, *Stachys ajugoides*, and *Symphyotrichum chilense*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.4	0.0 – 1.2	1.5	1 – 2
Shrub	5.5	4.0 – 7.0	2.1	0.5 – 5
Herb	74.0	70 – 78	0.8	0.5 – 1

Local Environmental Description

Elevation: Mean 94 m, Range 93 – 95 m

Aspect: SW (2)

Slope: Mean 8 degrees, Range 7 – 8 degrees

Macro Topography: Lower to Middle 1/3 of slope (1), Middle 1/3 of slope (1)

Large Rock: Mean 1.1%, Range 0.0 – 2.2%

Small Rock: Mean 2.1%, Range 0.2 – 4.0%

Fines Cover: Mean 22.5%, Range 15 – 30%

Litter Cover: Mean 70..5%, Range 60 – 81%

Soil Texture (field assessed): Medium to very fine, sandy loam (1), Fine silty clay (1)

Geology (field or map data): Serpentine (2)

San Mateo County Watersheds: San Mateo Bayside (2)

Site Impacts

This association has low non-native plant cover (average 6.5%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Agrostis avenacea*, *Cortaderia jubata*, *Dipsacus* spp., *Lactuca saligna*, *Picris echioides*, and *Polypogon monspeliensis*.

Classification Comments

Cirsium fontinale Provisional Association
Mimulus (guttatus) Herbaceous Alliance

This association is considered provisional since it is under-sampled in its expected range. Stands of this association were originally treated in its own *Cirsium fontinale* var. *campylon* Alliance with three associations *Cirsium fontinale* var. *campylon* – *Carex serratodens* – *Hordeum brachyantherum*, *Cirsium fontinale* var. *campylon* – *Hemizonia congesta* ssp. *luzulifolia*, and *Cirsium fontinale* var. *campylon* – *Mimulus guttatus* – *Stachys pycnantha* from Coyote Ridge (Evens and San 2004).

References: Evens and San 2004

Global Rarity Rank: GNR State Rarity Rank: SNR State Rare: Y

Surveys Used for Description

Total: N=2; San Mateo County (n=2): SMAT0150, SMATREL0206

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Regenerating or Shrubby Trees	<i>Quercus agrifolia</i>	50.0	41.7	0.5	1	1				Y
	<i>Pinus radiata</i>	50.0	8.3	0.1	0.2	0.2				Y
Shrub	<i>Baccharis pilularis</i>	100.0	53.6	3.0	2	4		Y		Y
	<i>Frangula californica</i>	50.0	25.0	1.0	2	2				Y
	<i>Toxicodendron diversilobum</i>	50.0	14.3	1.0	2	2				Y
	<i>Rubus ursinus</i>	50.0	7.1	0.5	1	1				Y
Herb	<i>Calamagrostis nutkaensis</i>	100.0	42.1	30.0	25	35			Y	Y
	<i>Cirsium fontinale</i>	100.0	36.4	25.0	20	30			Y	Y
	<i>Elymus triticoides</i>	100.0	4.1	2.6	0.2	5				Y
	<i>Lactuca saligna</i>	100.0	2.7	2.1	0.2	4				Y
	<i>Juncus arcticus</i>	100.0	1.4	1.1	0.2	2				Y
	<i>Mimulus guttatus</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Chlorogalum pomeridianum</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Carex serratodens</i>	50.0	3.8	3.0	6	6				Y
	<i>Stachys ajugoides</i>	50.0	1.9	1.5	3	3				Y
	<i>Symphotrichum</i>	50.0	1.3	1.0	2	2				Y

Cirsium fontinale Provisional Association
Mimulus (guttatus) Herbaceous Alliance

<i>chilense</i>						
<i>Agrostis avenacea</i>	50.0	0.8	0.5	1	1	Y
<i>Cortaderia jubata</i>	50.0	0.8	0.5	1	1	Y
<i>Polypogon monspeliensis</i>	50.0	0.6	0.5	1	1	Y
<i>Dipsacus spp.</i>	50.0	0.6	0.5	1	1	Y
<i>Picris echioides</i>	50.0	0.6	0.5	1	1	Y
<i>Lolium perenne</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Stachys spp.</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Sisyrinchium bellum</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Helenium puberulum</i>	50.0	0.2	0.1	0.2	0.2	Y
<i>Lotus corniculatus</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Koeleria macrantha</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Baccharis glutinosa</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Epilobium brachycarpum</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Nassella lepida</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Phacelia californica</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Cortaderia spp.</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Rumex crispus</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Verbascum blattaria</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Sonchus asper</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Centaurium muehlenbergii</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Verbena lasiostachys</i>	50.0	0.1	0.1	0.2	0.2	Y

***Mimulus guttatus* Association**

Common Name: Yellow Monkeyflower Patches

Alliance: *Mimulus (guttatus)* Herbaceous Alliance

Local Vegetation Description

The Yellow Monkeyflower Association forms an intermittent herbaceous layer. The shrub layer is sparse and the tree layer is absent. Characteristic herbs include *Mimulus guttatus*. Those herbs often present include *Angelica hendersonii*, *Cakile maritima*, *Cotula coronopifolia*, *Epilobium ciliatum*, *Erigeron glaucus*, *Eriophyllum stoechadifolium*, *Hemizonia congesta*, *Hordeum marinum*, *Juncus bufonius*, *Juncus occidentalis*, *Juncus phaeocephalus*, *Lactuca saligna*, *Lolium perenne*, *Montia fontana*, *Plantago maritima*, *Pleuropogon californicus*, *Poa secunda*, *Polypogon monspeliensis*, *Pseudognaphalium stramineum*, *Ranunculus californicus*, *Raphanus sativus*, *Rumex salicifolius*, *Sonchus asper*, *Trifolium bifidum*, *Trifolium microdon*, and *Trifolium variegatum*. Commonly associated non-vascular plants include Lichen and Moss.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.5	0.0 – 1.0	0.8	0.5 – 1
Herb	60.0	60 – 60	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 62 m, Range 17 – 107 m

Aspect: NW (1), SW (1)

Slope: Mean 33 degrees, Range 6 – 60 degrees

Macro Topography: Lower 1/3 of slope (1), Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: Mean 5.0%, Range 0.0 – 10.0%

Fines Cover: Mean 42.5%, Range 8.0 – 77.0%

Litter Cover: Mean 50.0%, Range 10.0 – 90%

Soil Texture (field assessed): Coarse, loamy sand (1), Medium silt (1)

Geology (field or map data): Granitic (generic) (1), Ultramafic (type unknown) (1)

San Mateo County Watersheds: Pacifica (1)

Other Watersheds, Marin Co.: Petaluma River (1)

Site Impacts

This association has greater cover of non-native (average 53.3%) than native. Non-native species that occur with highest frequency and abundance include *Cakile*

Mimulus guttatus Association
Mimulus (guttatus) Herbaceous Alliance

maritima, *Cotula coronopifolia*, *Hordeum marinum*, *Lactuca saligna*, *Lolium perenne*, *Polypogon monspeliensis*, *Raphanus sativus*, and *Sonchus asper*.

Classification Comments

Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Cooper and Wolf 2006, Klein et al. 2015, VegCAMP 2015a

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=2; San Mateo County (n=1): SMAT0271

Marin County (n=1): MARIN236

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Mimulus guttatus</i>	100.0	27.6	17.5	15	20				Y
	<i>Lolium perenne</i>	50.0	35.0	22.5	45	45				Y
	<i>Polypogon monspeliensis</i>	50.0	15.9	10.0	20	20				Y
	<i>Angelica hendersonii</i>	50.0	7.9	5.0	10	10				Y
	<i>Erigeron glaucus</i>	50.0	3.2	2.0	4	4				Y
	<i>Epilobium ciliatum</i>	50.0	3.2	2.0	4	4				Y
	<i>Raphanus sativus</i>	50.0	1.6	1.0	2	2				Y
	<i>Plantago maritima</i>	50.0	0.8	0.5	1	1				Y
	<i>Eriophyllum stoechadifolium</i>	50.0	0.8	0.5	1	1				Y
	<i>Juncus occidentalis</i>	50.0	0.8	0.5	1	1				Y
	<i>Ranunculus californicus</i>	50.0	0.8	0.5	1	1				Y
	<i>Sonchus asper</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Pseudognaphalium stramineum</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Rumex salicifolius</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Cakile maritima</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Cotula coronopifolia</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Poa secunda</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Juncus bufonius</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Trifolium microdon</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Hordeum marinum</i>	50.0	0.2	0.1	0.2	0.2				Y
	<i>Montia fontana</i>	50.0	0.2	0.1	0.2	0.2				Y

Mimulus guttatus Association
Mimulus (guttatus) Herbaceous Alliance

	<i>Lactuca saligna</i>	50.0	0.2	0.1	0.2	0.2	Y
	<i>Juncus phaeocephalus</i>	50.0	0.2	0.1	0.2	0.2	Y
	<i>Pleuropogon californicus</i>	50.0	0.2	0.1	0.2	0.2	Y
	<i>Trifolium bifidum</i>	50.0	0.2	0.1	0.2	0.2	Y
	<i>Trifolium variegatum</i>	50.0	0.2	0.1	0.2	0.2	Y
	<i>Hemizonia congesta</i>	50.0	0.2	0.1	0.2	0.2	Y
Non-Vascular							
	Moss	50.0	25.0	0.1	0.2	0.2	Y
	Lichen	50.0	25.0	0.1	0.2	0.2	Y

***Nassella* spp. – *Melica* spp. Herbaceous Alliance**



Common Name: Needle grass - Melic grass grassland

NVC Alliance Code: A1248. *Nassella lepida* - *Melica torreyana* Grassland Alliance

Statewide Description

Melica californica, *M. torreyana*, *Nassella cernua*, *N. lepida*, and/or *N. pulchra* dominate in the herbaceous layer with *Aristida ternipes*, *Avena* spp., *Bromus* spp., *Calochortus* spp., *Calamagrostis koelerioides*, *Calystegia* spp., *Chlorogalum pomeridianum*, *Clarkia* spp., *Croton setigerus*, *Cryptantha* spp., *Daucus pusillus*, *Dichelostemma capitatum*, *Elymus* spp., *Eriogonum* spp., *Erodium* spp., *Eschscholzia californica*, *Festuca californica*, *Hirschfeldia incana*, *Holocarpha virgata*, *Hordeum brachyantherum*, *Koeleria macrantha*, *Lasthenia* spp., *Lepidium nitidum*, *Leymus triticoides*, *Lolium perenne*, *Lupinus* spp., *Plantago* spp., *Poa secunda*, *Sanicula* spp., *Sisyrinchium bellum*, *Trifolium* spp., and *Vulpia* spp. Emergent trees and shrubs may be present at low cover.

Nassella pulchra stands commonly exist in deep and clay-rich soils, but they also occur in sterile serpentine soils (Evens and San 2004, Gelbard and Harrison 2003, Hamilton 1997, Harrison and Viers 2007, McNaughton 1968) or in shallow soils of coastal hills in central and southern California (Keeler-Wolf et al. 2003a). Coastal stands currently occur from Baja California, and San Diego Co., northward across the Coast Ranges to Sonoma Co. (Bartolome et al. 2007a), and coastal stands tend to have more emergent shrubs, suggesting seral and/or dynamic relationships with woody vegetation types

(Tyler et al. 2007). *Nassella cernua* stands commonly appear in the transition between coastal/valley grasslands and inland/desert steppes. For example, *N. cernua* and *Achnatherum speciosum* replace *N. pulchra* and *Leymus triticoides* in the transition between the eastern desert slopes of southern California mountains and the valley grasslands (Bartolome et al. 2007a).

In southern California, *Nassella lepida* is a common understory herb on dry, fine-textured soils in stands of the *Artemisia californica* and *Salvia leucophylla* Alliances. In some areas, such as the Santa Monica Mountains, small (< 1 ha) glades dominated by this species occur with a diverse mixture of native plants.

Melica californica has a broad elevation range from near sea level on the North and Central Coast to over 1500 m elevation in the Coast Ranges, Klamath Mountains, and the Sierra Nevada. Stands are best described from Sonoma and Napa Cos. where they tend to occur on more mesic slopes than stands dominated by *Nassella pulchra*. *M. californica* often forms small stands in openings in woodlands of *Quercus agrifolia*, *douglasii*, *garryana*, *lobata*, and *wislizeni*. It is tolerant of serpentine soils and may grow in relatively deep or shallow soils.

Melica torreyana is endemic to California, typically occurring under a canopy of chaparral and forests. At times, it dominates in open habitats where the plants form loose tufts of culms forming localized stands in grasslands or meadows. *Melica torreyana* stands appear to occur both on and off serpentine substrates.

Melica imperfecta and *M. stricta* have not been observed to form stands; both tend to occur in drier, rockier areas and are often components of other alliances.

Local Vegetation Description

The Needle grass - Melic grass grassland Alliance forms an intermittent to continuous herbaceous layer. The shrub layer is sparse and the tree layer is typically absent. Characteristic herbs include *Lolium perenne* and *Nassella pulchra*. Those herbs often present include *Avena* spp., *Brachypodium distachyon*, *Bromus hordeaceus*, *Eschscholzia californica*, and *Vulpia bromoides*, and herbs that are sometimes present include *Achillea millefolium*, *Anagallis arvensis*, *Bromus carinatus*, *Bromus diandrus*, *Calystegia subacaulis*, *Carduus pycnocephalus*, *Chlorogalum pomeridianum*, *Clarkia rubicunda*, *Danthonia californica*, *Dichelostemma capitatum*, *Elymus glaucus*, *Elymus multisetus*, *Erodium botrys*, *Geranium dissectum*, *Layia platyglossa*, *Lotus wrangelianus*, *Melica californica*, *Nassella lepida*, *Plantago erecta*, *Sisyrinchium bellum*, *Sonchus asper*, and *Vulpia microstachys*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis*. Commonly associated non-vascular plants include Moss.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0.2	no data	no data
Shrub	0.7	0 – 6	no data	no data
Herb	71.4	40 – 95	0.5	0 – 1

Local Membership Rule

Melica californica, *M. torreyana*, and/or *Nassella* spp. are dominant, co-dominant or characteristic in stands. *Avena*, *Bromus*, *Hemizonia congesta*, *Lolium perenne*, *Plantago erecta*, *P. lanceolata*. and/or *Trifolium* spp. intermix as dominant, co-dominant or characteristic taxa in associations of this alliance. If *Danthonia californica* or *Festuca idahoensis* is co-dominant or characteristic with *Nassella pulchra*, then key to the *Festuca idahoensis* – *Danthonia* alliance.

Local Environmental Description

Elevation: Mean 244 m, Range 67 – 760 m

Aspect: SW (12), SE (7), NW (3), S (2), NE (1)

Slope: Mean 10 degrees, Range 2 – 20 degrees

Macro Topography: Upper 1/3 of slope (10), Middle 1/3 of slope (7), Lower 1/3 of slope (3), Ridge top (1), Upper 1/3 of slope to Ridgetop (1), Bottom (1)

Large Rock: Mean 2.2%, Range 0.0 – 9.2%

Small Rock: Mean 2.3%, Range 0.2 – 5.2%

Fines Cover: Mean 2.6%, Range 0.2 – 15.0%

Litter Cover: Mean 16.7%, Range 0.2 – 93%

Soil Texture (field assessed): Clay, (class unknown) (2), Moderately fine silty clay loam (1), Medium silt (1), Medium silt loam (1), Moderately coarse, sandy loam (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Franciscan melange (5), Sandstone and other sedimentary (5), Ultramafic rocks, mostly serpentine (5), Serpentine (3), Sandstone, shale, and conglomerate (3), Volcanic and metavolcanic rocks (2), Mixed metamorphic (1), Sandstone (1)

San Mateo County Watersheds: San Mateo Bayside (12), San Francisco Coastal (7), Pescadero Creek (4), Palo Alto (2)

Site Impacts

This alliance has greater cover of exotics than natives, non-native plant cover (average 54.7%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Brachypodium distachyon*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Erodium botrys*, *Geranium dissectum*, *Sonchus asper*, and *Vulpia bromoides*.

Associations in San Mateo County

- *Elymus multisetus* – (*Eschscholzia californica* – *Plantago erecta*)
- *Melica californica*
- *Nassella lepida*
- *Nassella pulchra* – *Avena* spp. – *Bromus* spp.
- *Nassella pulchra* – *Hemizonia congesta*
- *Nassella pulchra* – *Lolium perenne* – (*Trifolium* spp.)
- *Nassella pulchra* – *Lolium perenne* – *Plantago erecta* Serpentine
Nassella spp. – *Melica* spp. Herbaceous Alliance

Classification Comments

None.

References: AECOM 2013, Buck and Evens 2010, Buck-Diaz and Evens 2011b, Buck-Diaz et al. 2011, Buck-Diaz et al. 2012, Buck-Diaz et al. 2013, Buck-Diaz et al. 2020, Evens and Kentner 2006, Evens and San 2004, Fiedler and Leidy 1987, Junak et al. 2007, Keeler-Wolf and Evens 2006, Klein et al. 2007, Klein et al. 2015, Parker 1990b, Rodriguez et al. 2017, Sproul et al. 2011, VegCAMP 2014, Verdone and Evens 2010

Global Rarity Rank: G3G4 **State Rarity Rank:** S3S4

Surveys Used for Description

Total: N=26; San Mateo County (n=26): CORT035, CORT036, CORT037, CORT042, CORT043, CORT052, CORT070, CORT083, CORT084, CORT114, CORT115, CORT116, CORT117, CORT118, CORT131, CORT132, CORT133, CORT149, CORT150, GGNRA262, PWSG03A, PWSG04A, SMAT0079, SMAT0246, SMAT0262, SMAT0330

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	30.8	22.0	0.5	0.2	5				
Herb	<i>Nassella pulchra</i>	96.2	16.0	21.4	0.2	59	Y			Y
	<i>Lolium perenne</i>	76.9	14.1	14.4	1	36	Y			Y
	<i>Bromus hordeaceus</i>	69.2	5.5	7.1	0.2	37				Y
	<i>Avena spp.</i>	65.4	5.9	8.0	0.2	32				Y
	<i>Brachypodium distachyon</i>	50.0	12.7	17.4	2	87				Y
	<i>Vulpia bromoides</i>	50.0	3.9	6.7	0.2	38				Y
	<i>Eschscholzia californica</i>	50.0	0.6	0.6	0.2	7				Y
	<i>Elymus multisetus</i>	46.2	4.1	4.8	0.2	43				
	<i>Chlorogalum pomeridianum</i>	46.2	0.5	0.5	0.2	11				
	<i>Bromus diandrus</i>	42.3	2.8	4.6	0.2	44				
	<i>Plantago erecta</i>	42.3	3.8	3.6	0.2	31				
	<i>Sonchus asper</i>	42.3	0.5	1.0	0.2	16				
	<i>Melica californica</i>	38.5	1.6	2.7	0.2	48				
	<i>Anagallis arvensis</i>	38.5	0.3	0.5	0.2	9				
	<i>Bromus carinatus</i>	34.6	0.8	0.9	0.2	10				
<i>Clarkia rubicunda</i>	34.6	0.4	0.4	0.2	3					
<i>Layia platyglossa</i>	30.8	1.6	1.8	0.2	15					

Nassella spp. – *Melica* spp. Herbaceous Alliance

<i>Calystegia subacaulis</i>	30.8	0.3	0.4	0.2	5	
<i>Sisyrinchium bellum</i>	30.8	0.1	0.1	0.2	0.2	
<i>Nassella lepida</i>	26.9	3.2	4.6	0.2	31	
<i>Geranium dissectum</i>	26.9	0.4	0.6	0.2	6	
<i>Erodium botrys</i>	26.9	0.3	0.4	0.2	5	
<i>Danthonia californica</i>	26.9	0.2	0.3	0.2	2	
<i>Carduus pycnocephalus</i>	26.9	0.1	0.1	0.2	1	
<i>Achillea millefolium</i>	26.9	0.1	0.1	0.2	1	
<i>Vulpia microstachys</i>	23.1	0.7	0.7	0.2	10	
<i>Lotus wrangelianus</i>	23.1	0.7	0.7	0.2	11	
<i>Elymus glaucus</i>	23.1	0.1	0.1	0.2	1	
<i>Dichelostemma capitatum</i>	23.1	0.0	0.0	0.2	0.2	
Non-Vascular						
Moss	69.2	67.3	0.1	0.2	0.2	Y

***Elymus multisetus* – (*Eschscholzia californica* – *Plantago erecta*) Association**

Common Name: Big Squirreltail Grass Patches

Alliance: *Nassella* spp. – *Melica* spp. Herbaceous Alliance

Local Vegetation Description

The Big Squirreltail Grass Association forms a continuous herbaceous layer. The shrub layer is absent and the tree layer is absent. Characteristic herbs include *Elymus multisetus*, *Eschscholzia californica*, and *Nassella pulchra*. Those herbs often present include *Achillea millefolium*, *Avena* spp., *Bromus hordeaceus*, *Clarkia purpurea*, *Lolium perenne*, *Plantago erecta*, *Sisyrinchium bellum*, and herbs that are sometimes present include *Allium serra*, *Bromus diandrus*, *Calystegia collina*, *Chlorogalum pomeridianum*, *Cryptantha flaccida*, *Dichelostemma capitatum*, *Eriogonum nudum*, *Hemizonia congesta*, *Lasthenia californica*, *Lomatium utriculatum*, *Lotus micranthus*, *Melica torreyana*, *Poa secunda*, *Ranunculus californicus*, *Rumex acetosella*, *Sanicula bipinnatifida*, *Trifolium albopurpureum*, *Trifolium willdenovii*, and *Vulpia bromoides*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.0	0.0 – 0.0	no data	no data
Herb	90.0	80 – 95	0.8	0.5 – 1

Local Environmental Description

Elevation: Mean 524 m, Range 208 – 760 m

Aspect: NW (1), SE (1), SW (1)

Slope: Mean 8 degrees, Range 4 – 15 degrees

Macro Topography: Upper 1/3 of slope (2), Ridge top (1)

Large Rock: 0.0%

Small Rock: 0.2%

Fines Cover: Mean 0.5%, Range 0.2 – 1.0%

Litter Cover: Mean 31.1%, Range 0.2 – 93%

Soil Texture (field assessed): Moderately fine sandy clay loam (1)

Geology (field or map data): Sandstone (1), Sandstone and other sedimentary (1), Ultramafic rocks, mostly serpentine (1)

San Mateo County Watersheds: Pescadero Creek (2), San Mateo Bayside (1)

Site Impacts

Elymus multisetus – (*Eschscholzia californica* – *Plantago erecta*) Association
Nassella spp. – *Melica* spp. Herbaceous Alliance

This association has greater cover of exotics (average 52.1%) than natives. Non-native species that occur with highest frequency and abundance include *Avena* spp., *Bromus diandrus*, *Bromus hordeaceus*, *Lolium perenne*, *Rumex acetosella*, and *Vulpia bromoides*.

Classification Comments

This association was originally placed in the *Elymus (elymoides, multisetus)* Alliance. However, its similarity to serpentinite stands of *Nassella pulchra* suggests that it is better placed in this alliance.

References: Evens and San 2004, Evens et al. 2006, Klein et al. 2015

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=3; San Mateo County (n=3): CORT036, CORT070, SMAT0262

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Elymus multisetus</i>	100.0	21.7	29.0	16	43				Y
	<i>Eschscholzia californica</i>	100.0	2.9	2.5	0.2	7				Y
	<i>Bromus hordeaceus</i>	66.7	9.5	9.0	7	20				Y
	<i>Bromus diandrus</i>	66.7	8.9	14.7	0.2	44				Y
	<i>Vulpia bromoides</i>	66.7	8.7	12.7	4	34				Y
	<i>Lolium perenne</i>	66.7	7.3	11.7	8	27				Y
	<i>Avena</i> spp.	66.7	6.9	7.3	10	12				Y
	<i>Nassella pulchra</i>	66.7	3.5	5.1	0.2	15				Y
	<i>Crepis vesicaria</i>	66.7	2.5	4.1	0.2	12				Y
	<i>Rumex acetosella</i>	66.7	2.1	1.7	0.2	5				Y
	<i>Clarkia rubicunda</i>	66.7	0.2	0.4	0.2	1				Y
	<i>Geranium dissectum</i>	66.7	0.1	0.1	0.2	0.2				Y
	<i>Clarkia purpurea</i>	66.7	0.1	0.1	0.2	0.2				Y
	<i>Layia platyglossa</i>	33.3	3.5	5.0	15	15				
	<i>Madia gracilis</i>	33.3	3.2	2.7	8	8				
	<i>Plantago erecta</i>	33.3	3.0	4.3	13	13				
	<i>Lasthenia californica</i>	33.3	2.3	3.3	10	10				
	<i>Cynosurus echinatus</i>	33.3	2.0	1.7	5	5				
	<i>Lupinus formosus</i>	33.3	1.6	2.7	8	8				
	<i>Agrostis microphylla</i>	33.3	1.4	2.0	6	6				
	<i>Torilis arvensis</i>	33.3	1.2	1.0	3	3				
	<i>Brodiaea terrestris</i>	33.3	0.9	1.3	4	4				
	<i>Hypochaeris glabra</i>	33.3	0.8	0.7	2	2				

Elymus multisetus – (*Eschscholzia californica* – *Plantago erecta*) Association
Nassella spp. – *Melica* spp. Herbaceous Alliance

<i>Brachypodium distachyon</i>	33.3	0.8	1.3	4	4	
<i>Lotus wrangelianus</i>	33.3	0.7	1.0	3	3	
<i>Agoseris grandiflora</i>	33.3	0.6	1.0	3	3	
<i>Bromus carinatus</i>	33.3	0.5	0.7	2	2	
<i>Castilleja exserta</i>	33.3	0.5	0.7	2	2	
<i>Lathyrus cicera</i>	33.3	0.4	0.3	1	1	
<i>Carduus pycnocephalus</i>	33.3	0.4	0.3	1	1	
<i>Delphinium decorum</i>	33.3	0.2	0.3	1	1	
<i>Trifolium albopurpureum</i>	33.3	0.2	0.3	1	1	
<i>Trifolium microcephalum</i>	33.3	0.1	0.1	0.2	0.2	
<i>Trifolium willdenovii</i>	33.3	0.1	0.1	0.2	0.2	
<i>Sidalcea malviflora</i>	33.3	0.1	0.1	0.2	0.2	
<i>Erodium brachycarpum</i>	33.3	0.1	0.1	0.2	0.2	
<i>Croton setigerus</i>	33.3	0.1	0.1	0.2	0.2	
<i>Lotus micranthus</i>	33.3	0.1	0.1	0.2	0.2	
<i>Aira caryophyllea</i>	33.3	0.1	0.1	0.2	0.2	
<i>Vicia sativa</i>	33.3	0.1	0.1	0.2	0.2	
<i>Calystegia spp.</i>	33.3	0.0	0.1	0.2	0.2	
<i>Melica californica</i>	33.3	0.0	0.1	0.2	0.2	
<i>Erodium cicutarium</i>	33.3	0.0	0.1	0.2	0.2	
<i>Anagallis arvensis</i>	33.3	0.0	0.1	0.2	0.2	
<i>Wyethia glabra</i>	33.3	0.0	0.1	0.2	0.2	
<i>Madia sativa</i>	33.3	0.0	0.1	0.2	0.2	
<i>Elymus glaucus</i>	33.3	0.0	0.1	0.2	0.2	
<i>Sonchus asper</i>	33.3	0.0	0.1	0.2	0.2	
<i>Grindelia hirsutula</i>	33.3	0.0	0.1	0.2	0.2	
<i>Sisyrinchium bellum</i>	33.3	0.0	0.1	0.2	0.2	
<i>Torilis nodosa</i>	33.3	0.0	0.1	0.2	0.2	
Non-Vascular						
Moss	66.7	66.7	0.1	0.2	0.2	Y

***Melica californica* Association**

Common Name: California Melicgrass Patches

Alliance: *Nassella* spp. – *Melica* spp. Herbaceous Alliance

Local Vegetation Description

The California Melicgrass Association forms an intermittent to continuous herbaceous layer. The shrub layer is sparse and the tree layer is absent. Characteristic herbs include *Avena* spp., *Melica californica*, and *Nassella pulchra*. Those herbs often present include *Bromus diandrus*, *Bromus hordeaceus*, *Chlorogalum pomeridianum*, *Eschscholzia californica*, and *Lolium perenne*, and herbs that are sometimes present include *Achillea millefolium*, *Aira caryophyllea*, *Anagallis arvensis*, *Brachypodium distachyon*, *Briza maxima*, *Bromus carinatus*, *Carduus pycnocephalus*, *Cynosurus echinatus*, *Elymus glaucus*, *Elymus multisetus*, *Eriogonum nudum*, *Erodium botrys*, *Hypochaeris glabra*, *Lupinus bicolor*, *Plantago erecta*, *Ranunculus californicus*, *Rumex acetosella*, *Sanicula bipinnatifida*, *Sidalcea malviflora*, and *Sonchus asper*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.8	0 – 3.2	no data	no data
Herb	79.4	51 – 99	no data	no data

Local Environmental Description

Elevation: Mean 532 m, Range 105 – 796 m

Aspect: SW (4), NW (1), S (1)

Slope: Mean 12 degrees, Range 6 – 19 degrees

Macro Topography: Middle 1/3 of slope (4), Bottom (1), Ridge top (1)

Large Rock: no data

Small Rock: no data

Fines Cover: 0.2%

Litter Cover: Mean 0.6%, Range 0.2 – 1%

Soil Texture (field assessed):

Geology (field or map data): Sandstone and other sedimentary (4), Sandstone, shale, and conglomerate (2)

San Mateo County Watersheds: San Mateo Bayside (2), Pescadero Creek (2)

Other Watersheds, Santa Cruz Co.: Pescadero Creek (2)

Site Impacts

Melica californica Association
Nassella spp. – *Melica* spp. Herbaceous Alliance

This association has greater cover of non-native (average 60.2%) than native. Non-native species that occur with highest frequency and abundance include *Aira caryophylla*, *Anagallis arvensis*, *Avena* spp., *Brachypodium distachyon*, *Briza maxima*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Cynosurus echinatus*, *Erodium botrys*, *Hypochaeris glabra*, *Lolium perenne*, *Rumex acetosella*, and *Sonchus asper*.

Classification Comments

Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Klein et al. 2015, VegCAMP 2014

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=6; San Mateo County (n=4): CORT083, CORT084, CORT149, CORT150

Santa Cruz County (n=2): CORT152, CORT153

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	75.0	52.6	0.9	0.2	3		Y		Y
	<i>Artemisia californica</i>	50.0	22.4	0.3	0.2	1				Y
Herb	<i>Nassella pulchra</i>	100.0	24.1	32.8	23	50				Y
	<i>Avena</i> spp.	100.0	19.0	25.8	20	32				Y
	<i>Melica californica</i>	100.0	9.6	16.5	2	48				Y
	<i>Bromus hordeaceus</i>	100.0	9.4	18.1	0.2	37				Y
	<i>Vulpia bromoides</i>	75.0	5.6	10.0	5	29				Y
	<i>Bromus diandrus</i>	75.0	4.7	8.3	4	18				Y
	<i>Bromus carinatus</i>	75.0	3.3	3.6	0.2	10				Y
	<i>Lolium perenne</i>	75.0	2.0	4.0	1	14				Y
	<i>Anagallis arvensis</i>	75.0	1.3	2.4	0.2	9				Y
	<i>Elymus glaucus</i>	75.0	0.3	0.4	0.2	1				Y
	<i>Sonchus asper</i>	75.0	0.3	0.6	0.2	1				Y
	<i>Crepis capillaris</i>	50.0	3.1	6.0	9	15				Y
	<i>Brachypodium distachyon</i>	50.0	2.5	3.0	4	8				Y
	<i>Lathyrus cicera</i>	50.0	1.0	2.0	4	4				Y
<i>Eschscholzia californica</i>	50.0	1.0	1.1	0.2	4				Y	

Melica californica Association
Nassella spp. – *Melica* spp. Herbaceous Alliance

<i>Briza minor</i>	50.0	0.9	1.8	1	6	Y
<i>Vicia sativa</i>	50.0	0.8	1.5	2	4	Y
<i>Rumex acetosella</i>	50.0	0.6	1.0	2	2	Y
<i>Cynosurus echinatus</i>	50.0	0.5	1.0	2	2	Y
<i>Clarkia rubicunda</i>	50.0	0.5	1.0	1	3	Y
<i>Lupinus bicolor</i>	50.0	0.3	0.5	1	1	Y
<i>Chlorogalum pomeridianum</i>	50.0	0.2	0.3	0.2	1	Y
<i>Iris missouriensis</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Eriogonum latifolium</i>	50.0	0.1	0.1	0.2	0.2	Y
<i>Agrostis densiflora</i>	25.0	2.2	2.8	11	11	
<i>Vicia hirsuta</i>	25.0	1.1	2.0	8	8	
<i>Erodium botrys</i>	25.0	1.0	1.3	5	5	
<i>Torilis nodosa</i>	25.0	0.9	1.8	7	7	
<i>Geranium dissectum</i>	25.0	0.7	1.5	6	6	
<i>Aira caryophyllea</i>	25.0	0.6	0.8	3	3	
<i>Trifolium gracilentum</i>	25.0	0.4	0.8	3	3	
<i>Danthonia californica</i>	25.0	0.4	0.5	2	2	
<i>Trifolium albopurpureum</i>	25.0	0.3	0.5	2	2	
<i>Clarkia spp.</i>	25.0	0.2	0.3	1	1	
<i>Plantago erecta</i>	25.0	0.2	0.3	1	1	
<i>Elymus multisetus</i>	25.0	0.2	0.3	1	1	
<i>Eriogonum spp.</i>	25.0	0.1	0.3	1	1	
<i>Trifolium spp.</i>	25.0	0.1	0.3	1	1	
<i>Carduus pycnocephalus</i>	25.0	0.0	0.1	0.2	0.2	
<i>Oxalis radicata</i>	25.0	0.0	0.1	0.2	0.2	
<i>Salvia spathacea</i>	25.0	0.0	0.1	0.2	0.2	
<i>Sonchus oleraceus</i>	25.0	0.0	0.1	0.2	0.2	
<i>Acaena pinnatifida</i>	25.0	0.0	0.1	0.2	0.2	
<i>Silene gallica</i>	25.0	0.0	0.1	0.2	0.2	
<i>Poa secunda</i>	25.0	0.0	0.1	0.2	0.2	
<i>Castilleja spp.</i>	25.0	0.0	0.1	0.2	0.2	
<i>Clarkia purpurea</i>	25.0	0.0	0.1	0.2	0.2	
<i>Cirsium vulgare</i>	25.0	0.0	0.1	0.2	0.2	
<i>Dichelostemma capitatum</i>	25.0	0.0	0.1	0.2	0.2	
<i>Sisyrinchium bellum</i>	25.0	0.0	0.1	0.2	0.2	
<i>Achillea millefolium</i>	25.0	0.0	0.1	0.2	0.2	
<i>Madia sativa</i>	25.0	0.0	0.1	0.2	0.2	
Non-Vascular						
Moss	50.0	50.0	0.1	0.2	0.2	Y

***Nassella lepida* Provisional Association**

Common Name: Foothill Needlegrass Patches

Alliance: *Nassella* spp. – *Melica* spp. Herbaceous Alliance

Local Vegetation Description

The Foothill Needlegrass Association forms a continuous herbaceous layer. The shrub layer is open and the tree layer is sparse. Dominant herbs include *Brachypodium distachyon*, and characteristic herbs include *Avena* spp., *Nassella lepida*, and *Nassella pulchra*. Those herbs often present include *Anagallis arvensis*, *Carduus pycnocephalus*, *Lolium perenne*, *Sonchus asper*, *Urospermum picroides*, and *Vulpia bromoides*, and herbs that are sometimes present include *Aira caryophyllea*, *Bromus carinatus*, *Bromus diandrus*, *Bromus hordeaceus*, *Bromus madritensis*, *Calystegia subacaulis*, *Chlorogalum pomeridianum*, *Danthonia californica*, *Daucus carota*, *Erodium botrys*, *Geranium dissectum*, *Madia sativa*, *Sherardia arvensis*, *Silene gallica*, *Sisyrinchium bellum*, *Torilis nodosa*, *Vulpia microstachys*, and *Wyethia glabra*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis*, and commonly associated non-vascular plants include Moss.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.2	0.2 – 0.2	no data	no data
Shrub	1.6	0 – 6.0	no data	no data
Herb	78.0	66 – 95	no data	no data

Local Environmental Description

Elevation: Mean 117 m, Range 79 – 212 m

Aspect: SE (2), SW (2), NE (1)

Slope: Mean 15 degrees, Range 7 – 20 degrees

Macro Topography: Middle 1/3 of slope (2), Upper 1/3 of slope (2), Lower 1/3 of slope (1)

Large Rock: no data

Small Rock: no data

Fines Cover: no data

Litter Cover: no data

Soil Texture (field assessed): no data

Geology (field or map data): Franciscan melange (4), Ultramafic rocks, mostly serpentine (1)

San Mateo County Watersheds: San Francisco Coastal (4), San Mateo Bayside (1)

Site Impacts

This association has greater cover of non-native (average 64.7%) than native.

Classification Comments

This association is considered provisional since it is under-sampled in its expected range. **References:** Keeler-Wolf and Evens 2006, Sproul et al. 2011, Verdone and Evens 2010

Global Rarity Rank: G3 **State Rarity Rank:** S3 **State Rare:** Y

Surveys Used for Description

Total: N=5; San Mateo County (n=5): CORT037, CORT114, CORT116, CORT117, CORT118

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	60.0	33.3	0.8	0.2	3				Y
	<i>Toxicodendron diversilobum</i>	40.0	10.0	0.1	0.2	0.2				
Herb	<i>Brachypodium distachyon</i>	100.0	33.6	47.4	2	87			Y	Y
	<i>Nassella lepida</i>	100.0	15.4	23.2	11	31				Y
	<i>Nassella pulchra</i>	100.0	11.8	19.8	5	34				Y
	<i>Avena spp.</i>	80.0	2.6	3.8	3	8				Y
	<i>Lolium perenne</i>	60.0	5.5	9.4	10.2	19				Y
	<i>Sonchus asper</i>	60.0	2.3	4.4	1	16				Y
	<i>Vulpia bromoides</i>	60.0	1.6	3.0	3	9				Y
	<i>Urospermum picroides</i>	60.0	0.5	0.8	0.2	3				Y
	<i>Carduus pycnocephalus</i>	60.0	0.3	0.4	0.2	1				Y
	<i>Anagallis arvensis</i>	60.0	0.2	0.3	0.2	1				Y
	<i>Torilis nodosa</i>	40.0	5.8	10.6	22	31				
	<i>Aira caryophyllea</i>	40.0	4.2	8.4	6	36				
	<i>Madia sativa</i>	40.0	2.7	5.4	0.2	27				
<i>Calystegia subacaulis</i>	40.0	1.1	1.6	3	5					

Nassella lepida Provisional Association
Nassella spp. – *Melica* spp. Herbaceous Alliance

	<i>Bromus hordeaceus</i>	40.0	1.1	1.6	1	7		
	<i>Geranium dissectum</i>	40.0	0.8	1.6	2	6		
	<i>Sherardia arvensis</i>	40.0	0.7	1.4	2	5		
	<i>Vulpia microstachys</i>	40.0	0.5	1.0	2	3		
	<i>Danthonia californica</i>	40.0	0.3	0.6	1	2		
	<i>Bromus carinatus</i>	40.0	0.3	0.6	1	2		
	<i>Daucus carota</i>	40.0	0.2	0.4	0.2	2		
	<i>Bromus diandrus</i>	40.0	0.2	0.4	0.2	2		
	<i>Erodium botrys</i>	40.0	0.2	0.2	0.2	1		
	<i>Bromus madritensis</i>	40.0	0.1	0.2	0.2	1		
	<i>Silene gallica</i>	40.0	0.1	0.1	0.2	0.2		
	<i>Wyethia glabra</i>	40.0	0.0	0.1	0.2	0.2		
	<i>Chlorogalum pomeridianum</i>	40.0	0.0	0.1	0.2	0.2		
	<i>Sisyrinchium bellum</i>	40.0	0.0	0.1	0.2	0.2		
Non-Vascular								
	Moss	100.0	100.0	0.2	0.2	0.2	Y	Y

***Nassella pulchra* – *Avena* spp. – *Bromus* spp. Association**

Common Name: Purple Needlegrass – Wild Oat – Annual Brome

Grassland Patches

Alliance: *Nassella* spp. – *Melica* spp. Herbaceous Alliance

Local Vegetation Description

The Purple Needlegrass – Wild Oat – Annual Brome Grassland Association forms a continuous herbaceous layer. The shrub layer is sparse and the tree layer is absent. Characteristic herbs include *Avena* spp., *Brachypodium distachyon*, *Bromus hordeaceus*, and *Nassella pulchra*. Those herbs often present include *Bromus diandrus* and *Lolium perenne*, and herbs that are sometimes present include *Anagallis arvensis*, *Briza maxima*, *Carduus pycnocephalus*, *Centaurea solstitialis*, *Chlorogalum pomeridianum*, *Erodium botrys*, *Eschscholzia californica*, and *Sisyrinchium bellum*. Commonly associated non-vascular plants include Moss.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.1	0 – 0.2	no data	no data
Herb	83.6	71 – 95	no data	no data

Local Environmental Description

Elevation: Mean 252 m, Range 67 – 682 m

Aspect: SE (3), SW (1)

Slope: Mean 15 degrees, Range 6 – 20 degrees

Macro Topography: Upper 1/3 of slope (3), Middle 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 3.0%

Fines Cover: Mean 0.8%, Range 0.2 – 2.0%

Litter Cover: Mean 3.6%, Range 0.2 – 13%

Soil Texture (field assessed): Moderately coarse, sandy loam (1)

Geology (field or map data): Sandstone, shale, and conglomerate (1), Volcanic and metavolcanic rocks (1), Franciscan melange (1)

San Mateo County Watersheds: San Francisco Coastal (2), Palo Alto (1)

Site Impacts

This association has greater cover of non-native (average 77.2%) than native. Non-native species that occur with highest frequency and abundance include *Anagallis*

Nassella pulchra – *Avena* spp. – *Bromus* spp. Association
Nassella spp. – *Melica* spp. Herbaceous Alliance

arvensis, *Avena* spp., *Brachypodium distachyon*, *Briza maxima*, *Bromus diandrus*, *Bromus hordeaceus*, *Carduus pycnocephalus*, *Centaurea solstitialis*, *Erodium botrys*, and *Lolium perenne*.

Classification Comments

None.

References: Buck and Evens 2010, Evens and Kentner 2006, Junak et al. 2007, Klein et al. 2015, Parker 1990b, Rodriguez et al. 2017

Global Rarity Rank: G3 **State Rarity Rank:** S3? **State Rare:** Y

Surveys Used for Description

Total: N=4; San Mateo County (n=4): CORT042, CORT052, CORT115, GGNRA262

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	25.0	25.0	0.1	0.2	0.2				
	<i>Lupinus albifrons</i>	25.0	25.0	0.1	0.2	0.2				
Herb	<i>Brachypodium distachyon</i>	100.0	36.5	48.8	14	85			Y	Y
	<i>Nassella pulchra</i>	100.0	20.5	30.8	11	45				Y
	<i>Avena</i> spp.	100.0	7.0	11.5	3	29				Y
	<i>Erodium botrys</i>	75.0	0.4	0.6	0.2	2				Y
	<i>Anagallis arvensis</i>	75.0	0.2	0.4	0.2	1				Y
	<i>Lolium perenne</i>	50.0	8.7	14.5	29	29				Y
	<i>Vulpia bromoides</i>	50.0	5.7	10.5	5	37				Y
	<i>Bromus hordeaceus</i>	50.0	5.4	9.0	17	19				Y
	<i>Bromus diandrus</i>	50.0	3.3	5.8	6	17				Y
	<i>Foeniculum vulgare</i>	50.0	1.3	1.6	0.2	6				Y
	<i>Calystegia purpurata</i>	50.0	0.2	0.3	0.2	1				Y
	<i>Carduus pycnocephalus</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Sonchus oleraceus</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Sonchus asper</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Cirsium vulgare</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Brassica rapa</i>	25.0	2.6	3.0	12	12				
	<i>Cynosurus echinatus</i>	25.0	1.0	1.5	6	6				
<i>Linum bienne</i>	25.0	0.8	1.3	5	5					
<i>Vicia sativa</i>	25.0	0.8	1.3	5	5					
<i>Plantago erecta</i>	25.0	0.7	1.3	5	5					

Nassella pulchra – *Avena* spp. – *Bromus* spp. Association
Nassella spp. – *Melica* spp. Herbaceous Alliance

<i>Geranium retrorsum</i>	25.0	0.6	0.8	3	3		
<i>Raphanus sativus</i>	25.0	0.6	0.8	3	3		
<i>Urospermum picroides</i>	25.0	0.5	1.0	4	4		
<i>Calystegia subacaulis</i>	25.0	0.3	0.5	2	2		
<i>Geranium dissectum</i>	25.0	0.3	0.5	2	2		
<i>Crepis vesicaria</i>	25.0	0.3	0.5	2	2		
<i>Eriogonum latifolium</i>	25.0	0.3	0.5	2	2		
<i>Madia sativa</i>	25.0	0.2	0.3	1	1		
<i>Melilotus spp.</i>	25.0	0.2	0.3	1	1		
<i>Briza minor</i>	25.0	0.2	0.3	1	1		
<i>Achillea millefolium</i>	25.0	0.1	0.3	1	1		
<i>Pseudognaphalium stramineum</i>	25.0	0.0	0.1	0.2	0.2		
<i>Lactuca saligna</i>	25.0	0.0	0.1	0.2	0.2		
<i>Medicago spp.</i>	25.0	0.0	0.1	0.2	0.2		
<i>Torilis nodosa</i>	25.0	0.0	0.1	0.2	0.2		
<i>Epilobium spp.</i>	25.0	0.0	0.1	0.2	0.2		
<i>Silene gallica</i>	25.0	0.0	0.1	0.2	0.2		
<i>Dichelostemma capitatum</i>	25.0	0.0	0.1	0.2	0.2		
<i>Bromus arvensis</i>	25.0	0.0	0.1	0.2	0.2		
<i>Calochortus luteus</i>	25.0	0.0	0.1	0.2	0.2		
<i>Brodiaea elegans</i>	25.0	0.0	0.1	0.2	0.2		
<i>Grindelia hirsutula</i>	25.0	0.0	0.1	0.2	0.2		
<i>Lupinus formosus</i>	25.0	0.0	0.1	0.2	0.2		
<i>Picris echioides</i>	25.0	0.0	0.1	0.2	0.2		
<i>Sisyrinchium bellum</i>	25.0	0.0	0.1	0.2	0.2		
<i>Lotus corniculatus</i>	25.0	0.0	0.1	0.2	0.2		
<i>Danthonia californica</i>	25.0	0.0	0.1	0.2	0.2		
<i>Dipsacus spp.</i>	25.0	0.0	0.1	0.2	0.2		
<i>Elymus multisetus</i>	25.0	0.0	0.1	0.2	0.2		
<i>Monardella villosa</i>	25.0	0.0	0.1	0.2	0.2		
<i>Chlorogalum pomeridianum</i>	25.0	0.0	0.1	0.2	0.2		
<i>Grindelia camporum</i>	25.0	0.0	0.1	0.2	0.2		
<i>Lupinus bicolor</i>	25.0	0.0	0.1	0.2	0.2		
Non-Vascular							
Moss	75.0	75.0	0.2	0.2	0.2	Y	Y

Nassella pulchra – *Avena* spp. – *Bromus* spp. Association
Nassella spp. – *Melica* spp. Herbaceous Alliance

***Nassella pulchra* – *Hemizonia congesta* Association**

Common Name: Purple Needlegrass – Hayfield Tarweed Patches

Alliance: *Nassella* spp. – *Melica* spp. Herbaceous Alliance

Local Vegetation Description

The Purple Needlegrass – Hayfield Tarweed Association forms a continuous herbaceous layer in the single sample available. The shrub layer is absent and the tree layer is absent. Dominant herbs include *Lolium perenne*, and characteristic herbs include *Bromus hordeaceus*, *Hemizonia congesta*, *Lotus wrangelianus*, and *Nassella pulchra*. Those herbs often present include *Avena* spp., *Chlorogalum pomeridianum*, *Plantago erecta*, and *Sisyrinchium bellum*, and herbs that are sometimes present include *Aira caryophyllea*, *Anagallis arvensis*, *Astragalus gambelianus*, *Brachypodium distachyon*, *Briza minor*, *Brodiaea elegans*, *Calystegia collina*, *Cryptantha flaccida*, *Danthonia californica*, *Dichelostemma capitatum*, *Eschscholzia californica*, *Euphorbia spathulata*, *Hypochaeris glabra*, *Microseris douglasii*, *Trifolium bifidum*, and *Triteleia laxa*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	NA	no data	no data
Hardwood	0.0	NA	no data	no data
Regenerating or Shrubby Tree	0.0	NA	no data	no data
Shrub	0.0	NA	no data	no data
Herb	70.0	NA	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 165 m, Range 165 – 165 m

Aspect: NW (1)

Slope: Mean 11 degrees, Range 11 – 11 degrees

Macro Topography: Upper 1/3 of slope to Ridgetop (1)

Large Rock: 0.6%

Small Rock: 0.4%

Fines Cover: 15.0%

Litter Cover: 81%

Soil Texture (field assessed): Medium silt loam (1)

Geology (field or map data): Serpentine (1)

San Mateo County Watersheds: Palo Alto (1)

Site Impacts

This association has moderate non-native plant cover (average 42.2%) relative to native

Nassella pulchra – *Hemizonia congesta* Association
Nassella spp. – *Melica* spp. Herbaceous Alliance

cover. Non- native species that occur with highest frequency and abundance include *Aira caryophyllea*, *Anagallis arvensis*, *Avena* spp., *Brachypodium distachyon*, *Briza minor*, *Bromus hordeaceus*, *Hypochaeris glabra*, and *Lolium perenne*.

Classification Comments

None.

References: Klein et al. 2015

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=1; San Mateo County (n=1): SMAT0246

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Hemizonia congesta</i>	100.0	27.9	20.0	20	20				Y
	<i>Lolium perenne</i>	100.0	27.9	20.0	20	20				Y
	<i>Nassella pulchra</i>	100.0	14.0	10.0	10	10				Y
	<i>Bromus hordeaceus</i>	100.0	14.0	10.0	10	10				Y
	<i>Clarkia rubicunda</i>	100.0	4.2	3.0	3	3				Y
	<i>Triteleia laxa</i>	100.0	2.8	2.0	2	2				Y
	<i>Melica californica</i>	100.0	2.8	2.0	2	2				Y
	<i>Elymus multisetus</i>	100.0	2.8	2.0	2	2				Y
	<i>Koeleria macrantha</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Trifolium willdenovii</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Lomatium macrocarpum</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Eschscholzia californica</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Achillea millefolium</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Calochortus albus</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Calochortus argillosus</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Delphinium hesperium</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Dodecatheon clevelandii</i> ssp. <i>patulum</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Lactuca saligna</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Plantago erecta</i>	100.0	0.3	0.2	0.2	0.2				Y
	<i>Triteleia hyacinthina</i>	100.0	0.3	0.2	0.2	0.2				Y
<i>Uropappus lindleyi</i>	100.0	0.3	0.2	0.2	0.2				Y	
Non-Vascular	Lichen	100.0	100.0	0.2	0.2	0.2		Y		Y

Nassella pulchra – *Hemizonia congesta* Association
Nassella spp. – *Melica* spp. Herbaceous Alliance

***Nassella pulchra* – *Lolium perenne* – (*Trifolium* spp.) Association**

Common Name: Italian Ryegrass – Purple Needlegrass Patches

Alliance: *Nassella* spp. – *Melica* spp. Herbaceous Alliance

Local Vegetation Description

The Italian Ryegrass – Purple Needlegrass Association forms an intermittent to continuous herbaceous layer. The shrub layer is absent and the tree layer is absent. Dominant herbs include *Lolium perenne*, and characteristic herbs include *Nassella pulchra*. Those herbs often present include *Avena* spp., *Bromus hordeaceus*, and *Chlorogalum pomeridianum*, and herbs that are sometimes present include *Achillea millefolium*, *Anagallis arvensis*, *Danthonia californica*, *Dichelostemma capitatum*, *Elymus glaucus*, *Eschscholzia californica*, *Hemizonia congesta*, *Lotus* spp., *Lotus wrangelianus*, *Plantago erecta*, *Sisyrinchium bellum*, *Triteleia laxa*, and *Vicia benghalensis*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.0	0.0 – 0.0	no data	no data
Herb	64.8	50 – 91	no data	no data

Local Environmental Description

Elevation: Mean 116 m, Range 50 – 162 m

Aspect: SE (2), SW (1), E (1)

Slope: Mean 7 degrees, Range 2 – 16 degrees

Macro Topography: Lower 1/3 of slope (1), Entire slope (1), Bottom (1), Middle 1/3 of slope (1)

Large Rock: 1.0%

Small Rock: 16.0%

Fines Cover: Mean 7.1%, Range 0.2 – 20.0%

Litter Cover: Mean 15.4%, Range 0.2 – 45%

Soil Texture (field assessed): Moderately fine sandy clay loam (1)

Geology (field or map data): Sandstone and other sedimentary (1), Sandstone, shale, and conglomerate (1), Serpentine (1), Ultramafic rocks, mostly serpentine (1)

San Mateo County Watersheds: San Mateo Bayside (1)

Other Watersheds, Santa Clara Co.: Coyote Creek (1), Guadalupe River (1), Palo Alto (1)

Site Impacts

Nassella pulchra – *Lolium perenne* – (*Trifolium* spp.) Association
Nassella spp. – *Melica* spp. Herbaceous Alliance

This association has greater cover of non-native (average 62.8%) than native. Non-native species that occur with highest frequency and abundance include *Anagallis arvensis*, *Avena* spp., *Bromus hordeaceus*, *Lolium perenne*, and *Vicia benghalensis*.

Classification Comments

Since the number of surveys of this association in San Mateo County are low, data from nearby counties were included.

References: Buck and Evens 2010, Evens and Kentner 2006, Fiedler and Leidy 1987, Rodriguez et al. 2017

Global Rarity Rank: G3 **State Rarity Rank:** S3? **State Rare:** Y

Surveys Used for Description

Total: N=4; San Mateo County (n=1): CORT133

Santa Clara County (n=3): CORT100, CORT145, COYO010

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Lolium perenne</i>	100.0	48.5	48.3	24	74			Y	Y
	<i>Nassella pulchra</i>	100.0	18.5	26.3	0.1	53				Y
	<i>Lotus wrangelianus</i>	75.0	3.5	3.1	0.2	11				Y
	<i>Bromus hordeaceus</i>	75.0	3.5	4.5	5	7				Y
	<i>Avena</i> spp.	75.0	1.6	2.5	0.1	6				Y
	<i>Castilleja exserta</i>	50.0	0.8	0.8	0.1	3				Y
	<i>Sonchus asper</i>	50.0	0.6	0.8	0.1	3				Y
	<i>Chlorogalum pomeridianum</i>	50.0	0.3	0.3	0.1	1				Y
	<i>Dichelostemma capitatum</i>	50.0	0.1	0.1	0.1	0.4				Y
	<i>Eschscholzia californica</i>	50.0	0.1	0.1	0.1	0.2				Y
	<i>Centaurea solstitialis</i>	50.0	0.1	0.1	0.1	0.2				Y
	<i>Triteleia laxa</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Brachypodium distachyon</i>	25.0	5.4	9.8	39	39				
	<i>Vulpia microstachys</i>	25.0	2.5	2.5	10	10				
	<i>Elymus multisetus</i>	25.0	2.3	2.3	9	9				
	<i>Corethrogyne filaginifolia</i>	25.0	2.1	0.8	3	3				
	<i>Dichelostemma congestum</i>	25.0	1.8	1.8	7	7				
	<i>Layia platyglossa</i>	25.0	1.8	1.8	7	7				
	<i>Hordeum marinum</i>	25.0	1.2	2.3	9	9				
	<i>Pentachaeta bellidiflora</i>	25.0	0.8	0.8	3	3				
	<i>Lasthenia glabrata</i>	25.0	0.8	0.8	3	3				

Nassella pulchra – *Lolium perenne* – (*Trifolium* spp.) Association
Nassella spp. – *Melica* spp. Herbaceous Alliance

<i>Trifolium gracilentum</i>	25.0	0.7	0.3	1	1	
<i>Vulpia bromoides</i>	25.0	0.7	1.3	5	5	
<i>Bromus diandrus</i>	25.0	0.6	1.0	4	4	
<i>Koeleria macrantha</i>	25.0	0.3	0.3	1	1	
<i>Trifolium dubium</i>	25.0	0.2	0.3	1	1	
<i>Galium parisiense</i>	25.0	0.2	0.3	1	1	
<i>Bromus madritensis</i>	25.0	0.2	0.3	1	1	
<i>Trifolium albopurpureum</i>	25.0	0.1	0.0	0.1	0.1	
<i>Lewisia rediviva</i>	25.0	0.1	0.0	0.1	0.1	
<i>Plantago erecta</i>	25.0	0.1	0.0	0.1	0.1	
<i>Lepidium nitidum</i>	25.0	0.1	0.0	0.1	0.1	
<i>Astragalus gambelianus</i>	25.0	0.1	0.0	0.1	0.1	
<i>Crassula connata</i>	25.0	0.1	0.0	0.1	0.1	
<i>Lactuca serriola</i>	25.0	0.1	0.0	0.1	0.1	
<i>Hemizonia congesta</i>	25.0	0.1	0.0	0.1	0.1	
<i>Epilobium minutum</i>	25.0	0.1	0.0	0.1	0.1	
<i>Stephanomeria virgata</i>	25.0	0.1	0.0	0.1	0.1	
<i>Muilla maritima</i>	25.0	0.1	0.0	0.1	0.1	
<i>Calystegia subacaulis</i>	25.0	0.1	0.1	0.2	0.2	
<i>Trifolium depauperatum</i>	25.0	0.0	0.1	0.2	0.2	
<i>Sisyrinchium bellum</i>	25.0	0.0	0.1	0.2	0.2	
<i>Agoseris grandiflora</i>	25.0	0.0	0.1	0.2	0.2	
<i>Brassica nigra</i>	25.0	0.0	0.1	0.2	0.2	
<i>Carduus pycnocephalus</i>	25.0	0.0	0.1	0.2	0.2	
Non-Vascular						
<i>Moss</i>	50.0	50.0	0.1	0.2	0.2	Y
<i>Lichen</i>	25.0	25.0	0.0	0.1	0.1	

***Nassella pulchra* – *Lolium perenne* – *Plantago erecta* Serpentine Association**

Common Name: Purple Needlegrass – Italian Ryegrass – California Plantain
Serpentine Patches

Alliance: *Nassella* spp. – *Melica* spp. Herbaceous Alliance

Local Vegetation Description

The Purple Needlegrass – Italian Ryegrass – California Plantain Serpentine Association forms an intermittent to continuous herbaceous layer. The shrub layer is sparse to absent and the tree layer is absent. Characteristic herbs include *Bromus hordeaceus*, *Chlorogalum pomeridianum*, *Layia platyglossa*, *Lolium perenne*, *Nassella pulchra*, and *Plantago erecta*. Those herbs often present include *Calystegia subacaulis*, *Elymus multisetus*, *Eschscholzia californica*, and *Lotus wrangelianus*. Commonly associated non-vascular plants include Moss.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.7	0.0 – 5.0	no data	no data
Herb	58.6	40 – 87	0.4	0 – 1

Local Environmental Description

Elevation: Mean 158 m, Range 98 – 194 m

Aspect: SW (4), NW (1), S (1), SE (1)

Slope: Mean 4 degrees, Range 3 – 7 degrees

Macro Topography: Upper 1/3 of slope (3), Lower 1/3 of slope (1), Middle 1/3 of slope (1)

Large Rock: Mean 4.1%, Range 1.2 – 9.2%

Small Rock: Mean 3.4%, Range 2.0 – 5.2%

Fines Cover: Mean 5.1%, Range 0.2 – 15.0%

Litter Cover: Mean 27.4%, Range 0.2 – 76%

Soil Texture (field assessed): Clay, (class unknown) (2), Medium silt (1), Moderately fine silty clay loam (1)

Geology (field or map data): Sandstone and other sedimentary (2), Serpentine (2), Ultramafic rocks, mostly serpentine (2), Volcanic and metavolcanic rocks (1), Mixed metamorphic (1)

San Mateo County Watersheds: San Mateo Bayside (7), San Francisco Coastal (1)

Site Impacts

This association has moderate non-native plant cover (average 42.1%) relative to native cover. Non- native species that occur with highest frequency and abundance include *Avena* spp., *Bromus diandrus*, *Bromus hordeaceus*, *Euphorbia peplus*, *Lactuca saligna*, *Lolium perenne*, *Plantago lanceolata*, *Sonchus asper*, *Torilis arvensis*, *Vulpia bromoides*, and *Vulpia myuros*.

Classification Comments

None.

References: Klein et al. 2015

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=8; San Mateo County (n=8): CORT035, CORT043, CORT131, CORT132, PWSG03A, PWSG04A, SMAT0079, SMAT0330

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Lolium perenne</i>	100.0	27.9	21.8	4	36				Y
	<i>Nassella pulchra</i>	100.0	17.5	20.4	2	59				Y
	<i>Plantago erecta</i>	87.5	10.6	9.3	2	31				Y
	<i>Chlorogalum pomeridianum</i>	87.5	1.5	1.5	0.2	11				Y
	<i>Bromus hordeaceus</i>	75.0	3.6	3.2	0.2	10				Y
	<i>Layia platyglossa</i>	75.0	2.9	3.1	0.2	9				Y
	<i>Elymus multisetus</i>	62.5	3.5	3.3	0.2	15				Y
	<i>Eschscholzia californica</i>	62.5	0.4	0.3	0.2	1				Y
	<i>Lotus wrangelianus</i>	50.0	0.7	0.7	0.2	3				Y
	<i>Calystegia subacaulis</i>	50.0	0.1	0.1	0.2	0.2				Y
	<i>Lessingia micradenia</i>	37.5	9.1	5.0	0.2	30				
	<i>Vulpia bromoides</i>	37.5	2.8	4.8	0.2	38				
	<i>Avena</i> spp.	37.5	1.9	2.2	0.2	14				
	<i>Euphorbia peplus</i>	37.5	0.7	0.4	0.2	3				
	<i>Vulpia microstachys</i>	37.5	0.6	0.6	0.2	4				
	<i>Bromus carinatus</i>	37.5	0.5	0.7	0.2	4				
	<i>Clarkia rubicunda</i>	37.5	0.3	0.3	0.2	2				
	<i>Triteleia laxa</i>	37.5	0.3	0.2	0.2	1				
	<i>Eriogonum nudum</i>	37.5	0.3	0.2	0.2	1				
	<i>Danthonia californica</i>	37.5	0.3	0.2	0.2	1				
	<i>Castilleja exserta</i>	37.5	0.3	0.3	0.2	1				

Nassella pulchra – *Lolium perenne* – *Plantago erecta* Serpentine Association
Nassella spp. – *Melica* spp. Herbaceous Alliance

<i>Melica californica</i>	37.5	0.1	0.1	0.2	0.2	
<i>Sisyrinchium bellum</i>	37.5	0.1	0.1	0.2	0.2	
<i>Achillea millefolium</i>	37.5	0.1	0.1	0.2	0.2	
<i>Delphinium variegatum</i>	37.5	0.1	0.1	0.2	0.2	
<i>Dichelostemma capitatum</i>	37.5	0.1	0.1	0.2	0.2	
<i>Lasthenia glabrata</i>	25.0	1.8	2.1	1	16	
<i>Bromus diandrus</i>	25.0	1.6	2.0	3	13	
<i>Hemizonia congesta</i>	25.0	0.9	0.4	0.2	3	
<i>Nassella lepida</i>	25.0	0.7	0.4	0.2	3	
<i>Plantago lanceolata</i>	25.0	0.2	0.3	0.2	2	
<i>Vulpia myuros</i>	25.0	0.2	0.3	0.2	2	
<i>Microseris douglasii</i>	25.0	0.2	0.1	0.2	0.4	
<i>Sonchus asper</i>	25.0	0.1	0.1	0.2	0.2	
<i>Torilis arvensis</i>	25.0	0.1	0.1	0.2	0.2	
<i>Elymus glaucus</i>	25.0	0.1	0.1	0.2	0.2	
<i>Epilobium brachycarpum</i>	25.0	0.1	0.1	0.2	0.2	
<i>Koeleria macrantha</i>	25.0	0.1	0.1	0.2	0.2	
<i>Lactuca saligna</i>	25.0	0.1	0.1	0.2	0.2	
<i>Crassula connata</i>	25.0	0.1	0.1	0.2	0.2	
<i>Monardella villosa</i>	25.0	0.1	0.1	0.2	0.2	
<i>Poa secunda</i>	25.0	0.1	0.1	0.2	0.2	
Non-Vascular						
Moss	62.5	56.3	0.1	0.2	0.2	Y

***Phalaris aquatica* – *Phalaris arundinacea* Herbaceous Semi-Natural Alliance**



Common Name: Harding grass – Reed Canary grass swards

NVC Alliance Code: A3846. *Phalaris arundinacea* Western Ruderal Marsh Alliance

Statewide Description

Phalaris aquatica or *Phalaris arundinacea* is dominant in the herbaceous layer. Scattered emergent shrubs may be present at low cover, including *Baccharis pilularis*, *Baccharis salicifolia*, *Ceanothus cuneatus* or *Salix* spp.

Stands of *Phalaris aquatica* have invaded many inland settings, especially grasslands with past disturbance (such as clearing) or from nearby intentional plantings. *P. aquatica* forms dense patches that prevent the germination of other species (Silveira 2000). Native species richness drops because of a thick surface litter and thatch build-up. In wetlands, land managers plant *Phalaris aquatica* for waterfowl food (Silveira 2000). Other *Phalaris* species are less invasive, but locally found in wildlands: *P. arundinacea*, *P. brachystachys*, *P. canariensis*, *P. caroliniana*, *P. minor*, and *P. paradoxa*. See DiTomaso and Healy (2007) for details.

Although *P. arundinacea* is considered to be native to California, it tends to form stands in cultivated and disturbed settings as some biotypes are of non-native origin (from Europe). Stands of *Phalaris arundinacea* are established in irrigated pastures, wet meadows, pond and lake margins, intermittent drainages and other riparian areas, where *P. arundinacea* often has displaced the local flora upon being cultivated and/or

Phalaris aquatica – *Phalaris arundinacea* Herbaceous Semi-Natural Alliance

escaped (Buck-Diaz et al. 2012). Because of this invasive behavior, associations of this species have been placed in this expanded alliance. This alliance was cited as *Phalaris aquatica* Herbaceous Semi-Natural Alliance in the 2009 book, A Manual of California Vegetation, second edition, and has been expanded to include ruderal stands of *P. arundinacea*.

Local Vegetation Description

The Harding grass – Reed Canary grass swards Alliance forms an open to continuous herbaceous layer. The shrub layer is open and the tree layer is sparse. Dominant herbs include *Phalaris aquatica*. Herbs that are sometimes present include *Aira caryophylla*, *Anagallis arvensis*, *Avena* spp., *Briza minor*, *Bromus hordeaceus*, *Carex* spp., *Cirsium vulgare*, *Festuca arundinacea*, *Geranium dissectum*, *Holcus lanatus*, *Juncus effusus*, *Juncus patens*, *Lolium perenne*, *Lotus corniculatus*, *Picris echioides*, and *Plantago lanceolata*. Commonly associated emergent shrubs include *Baccharis pilularis*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.1	0 – 1	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.1	0 – 1	3.5	2 – 5
Shrub	5.2	0 – 15	0.6	0 – 2
Herb	83.4	20 – 99	0.8	0.5 – 1

Local Membership Rule

Phalaris aquatica dominates in naturalized or planted stands. Other non-native herbs, such as *Avena barbata* and *Hypochaeris glabra* may be present with low cover.

Local Environmental Description

Elevation: Mean 64 m, Range 3 – 390 m

Aspect: SW (3), SE (2), NE (1)

Slope: Mean 5 degrees, Range 2 – 8 degrees

Macro Topography: Bottom (3), Lower 1/3 of slope (2), Upper 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: Mean 0.0%, Range 0.0 – 0.2%

Fines Cover: Mean 15.7%, Range 0.2 – 52.9%

Litter Cover: Mean 64.5%, Range 0.2 – 97%

Soil Texture (field assessed): Fine silty clay (3), Clay, (class unknown) (1), Fine sand (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Sandstone and other sedimentary (9), Alluvium (1), Chert (1), Sandstone, shale, and conglomerate (1), Serpentine (1), Volcanic flow rocks (1)

San Mateo County Watersheds: Ano Nuevo (2), Pescadero Creek (1)

Other Watersheds, Marin Co.: Point Reyes (6), Bolinas (2), Petaluma River (2); **Santa Clara Co.:**

Coyote Creek (1)

Phalaris aquatica – *Phalaris arundinacea* Herbaceous Semi-Natural Alliance

Site Impacts

This alliance has greater cover of exotics than natives, non-native plant cover (average 89.5%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira caryophyllea*, *Anagallis arvensis*, *Briza minor*, *Bromus hordeaceus*, *Cirsium vulgare*, *Festuca arundinacea*, *Geranium dissectum*, *Holcus lanatus*, *Lotus corniculatus*, *Phalaris aquatica*, *Picris echioides*, and *Plantago lanceolata*.

Associations in San Mateo County

- *Phalaris aquatica*

Classification Comments

Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: AECOM 2013, Buck and Evens 2010, Buck-Diaz et al. 2012, Evens and San 2004, Keeler- Wolf and Vaghti 2000, Klein et al. 2015

Global Rarity Rank: GNA **State Rarity Rank:** SNA

Surveys Used for Description

Total: N=14; San Mateo County (n=3): SMAT0143, SMAT0302, TOKA129

Marin County (n=10): GGNRA307, MOSD0310, MOSD0313, PGA583, PGA5862, PGA5875, PGA5940, PGA5961, PGA6004, PGA6032

Santa Clara County (n=1): COYO086

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	71.4	49.9	3.5	0.2	15				Y
	<i>Rubus ursinus</i>	42.9	22.2	1.4	0.2	6				
	<i>Toxicodendron diversilobum</i>	21.4	6.1	0.2	0.2	2				
Herb	<i>Phalaris aquatica</i>	100.0	81.6	68.3	30	98	Y	Y		Y
	<i>Juncus patens</i>	42.9	0.5	0.4	0.2	2				
	<i>Festuca arundinacea</i>	28.6	2.0	1.7	0.2	20				
	<i>Lotus corniculatus</i>	28.6	0.6	0.6	0.2	7.0968				
	<i>Lolium perenne</i>	28.6	0.8	0.5	0.2	3				
	<i>Aira caryophyllea</i>	28.6	0.2	0.2	0.2	1				
	<i>Cirsium vulgare</i>	28.6	0.1	0.1	0.2	1				
	<i>Holcus lanatus</i>	21.4	4.8	4.3	15	30				

Phalaris aquatica – *Phalaris arundinacea* Herbaceous Semi-Natural Alliance

<i>Carex spp.</i>	21.4	0.8	0.7	0.2	10
<i>Juncus effusus</i>	21.4	0.4	0.4	0.2	5
<i>Bromus hordeaceus</i>	21.4	0.8	0.4	1	3
<i>Avena spp.</i>	21.4	0.7	0.3	0.2	3
<i>Picris echioides</i>	21.4	0.2	0.2	0.2	2
<i>Plantago lanceolata</i>	21.4	0.1	0.1	0.2	1
<i>Anagallis arvensis</i>	21.4	0.1	0.1	0.2	0.6452
<i>Briza minor</i>	21.4	0.1	0.1	0.2	0.6452
<i>Geranium dissectum</i>	21.4	0.1	0.0	0.2	0.2

***Phalaris aquatica* Provisional Semi-natural Association**

Common Name: Harding grass Patches

Alliance: *Phalaris aquatica* – *Phalaris arundinacea* Herbaceous Semi-Natural Alliance

Local Vegetation Description

The Harding grass Association forms an intermittent to continuous herbaceous layer. The shrub layer is sparse and the tree layer is absent. Dominant herbs include *Phalaris aquatica*. Those herbs that are sometimes present include *Aira caryophyllea*, *Anagallis arvensis*, *Avena* spp., *Briza minor*, *Bromus hordeaceus*, *Carex* spp., *Cirsium vulgare*, *Festuca arundinacea*, *Geranium dissectum*, *Holcus lanatus*, *Juncus effusus*, *Juncus patens*, *Lolium perenne*, *Lotus corniculatus*, *Picris echioides*, and *Plantago lanceolata*. Commonly associated emergent shrubs at sparse cover include *Baccharis pilularis*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	2.4	0.2 – 6.0	0.5	0 – 1
Herb	69.5	64 – 75	0.8	0.5 – 1

Local Environmental Description

Elevation: Mean 44 m, Range 22 – 69 m

Aspect: SE (1), SW (1)

Slope: Mean 6 degrees, Range 3 – 8 degrees

Macro Topography: Bottom (1), Lower 1/3 of slope

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 21%, Range 0.2 – 52.9%

Litter Cover: Mean 77%, Range 47.1 – 97%

Soil Texture (field assessed): Fine sand (1), Moderately fine sandy clay loam (1)

Geology (field or map data): Sandstone and other sedimentary (2), Alluvium (1)

San Mateo County Watersheds: Ano Nuevo (2), Pescadero Creek (1)

Site Impacts

This association has greater cover of non-native (average 85.2%) than native. Non-native species that occur with highest frequency and abundance include *Aira caryophyllea*, *Anagallis arvensis*, *Avena* spp., *Briza minor*, *Bromus hordeaceus*, *Cirsium vulgare*, *Festuca arundinacea*, *Geranium dissectum*, *Holcus lanatus*, *Lolium perenne*, *Lotus corniculatus*, *Phalaris aquatica*, *Picris echioides*, and *Plantago lanceolata*.

Classification Comments

This association is considered provisional since it is under-sampled in its expected range.

References: AECOM 2013, Buck and Evens 2010, Buck-Diaz et al. 2012, Keeler-Wolf and Vaghti 2000, Klein et al. 2015

Global Rarity Rank: GNA

State Rarity Rank: SNA

State Rare: N

Surveys Used for Description

Total: N=3; San Mateo County (n=3): SMAT0143, SMAT0302, TOKA129

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	100.0	41.6	0.5	0.2	1			Y	Y
	<i>Rubus ursinus</i>	66.7	44.5	2.3	1	6				Y
	<i>Toxicodendron diversilobum</i>	66.7	11.7	0.7	0.2	2				Y
	<i>Rosa californica</i>	33.3	2.2	0.2	0.6452	0.6452				
Herb	<i>Phalaris aquatica</i>	100.0	71.3	54.2	38.71	64			Y	Y
	<i>Lotus corniculatus</i>	66.7	2.5	2.4	0.2	7.0968				Y
	<i>Picris echioides</i>	66.7	0.9	0.7	0.2	2				Y
	<i>Juncus patens</i>	66.7	0.5	0.4	0.2	1				Y
	<i>Anagallis arvensis</i>	66.7	0.3	0.3	0.2	0.6452				Y
	<i>Cirsium vulgare</i>	66.7	0.2	0.1	0.2	0.2				Y
	<i>Geranium dissectum</i>	66.7	0.2	0.1	0.2	0.2				Y
	<i>Juncus spp.</i>	33.3	9.3	9.0	27.097	27.097				
	<i>Holcus lanatus</i>	33.3	6.4	5.0	15	15				
	<i>Vulpia bromoides</i>	33.3	2.4	2.4	7.0968	7.0968				
	<i>Lolium perenne</i>	33.3	0.9	0.9	2.5806	2.5806				
	<i>Hordeum marinum</i>	33.3	0.9	0.9	2.5806	2.5806				
	<i>Bromus hordeaceus</i>	33.3	0.7	0.6	1.9355	1.9355				
	<i>unknown Asteraceae</i>	33.3	0.7	0.6	1.9355	1.9355				
	<i>Briza minor</i>	33.3	0.2	0.2	0.6452	0.6452				
	<i>Silene vulgaris</i>	33.3	0.2	0.2	0.6452	0.6452				
	<i>Rumex spp.</i>	33.3	0.2	0.2	0.6452	0.6452				
	<i>Danthonia californica</i>	33.3	0.2	0.2	0.6452	0.6452				
	<i>Vicia spp.</i>	33.3	0.2	0.2	0.6452	0.6452				
	<i>Sisyrinchium bellum</i>	33.3	0.2	0.2	0.6452	0.6452				
<i>Bromus spp.</i>	33.3	0.1	0.1	0.2	0.2					
<i>Carex spp.</i>	33.3	0.1	0.1	0.2	0.2					

Phalaris aquatica Provisional Semi-natural Association
Phalaris aquatica – *Phalaris arundinacea* Herbaceous Semi-Natural Alliance

<i>Rumex crispus</i>	33.3	0.1	0.1	0.2	0.2
<i>Mentha pulegium</i>	33.3	0.1	0.1	0.2	0.2
<i>Vicia tetrasperma</i>	33.3	0.1	0.1	0.2	0.2
<i>Pteridium aquilinum</i>	33.3	0.1	0.1	0.2	0.2
<i>Rumex acetosella</i>	33.3	0.1	0.1	0.2	0.2
<i>Linum usitatissimum</i>	33.3	0.1	0.1	0.2	0.2
<i>Iris douglasiana</i>	33.3	0.1	0.1	0.2	0.2
<i>Dactylis glomerata</i>	33.3	0.1	0.1	0.2	0.2
<i>Conium maculatum</i>	33.3	0.1	0.1	0.2	0.2
<i>Agrostis spp.</i>	33.3	0.1	0.1	0.2	0.2
<i>Aira caryophyllea</i>	33.3	0.1	0.1	0.2	0.2
<i>Verbena lasiostachys</i>	33.3	0.1	0.1	0.2	0.2
<i>Rumex pulcher</i>	33.3	0.1	0.1	0.2	0.2
<i>Trifolium angustifolium</i>	33.3	0.1	0.1	0.2	0.2
<i>Trifolium dubium</i>	33.3	0.1	0.1	0.2	0.2
<i>Trifolium spp.</i>	33.3	0.1	0.1	0.2	0.2
<i>Pseudognaphalium californicum</i>	33.3	0.1	0.1	0.2	0.2
<i>Bromus carinatus</i>	33.3	0.1	0.1	0.2	0.2
Non-Vascular					
Moss	33.3	33.3	0.1	0.2	0.2

***Polygonum lapathifolium* – *Xanthium strumarium* Herbaceous Alliance**



Common Name: Smartweed – cocklebur patches
NVC Alliance Code: N/A.

Statewide Description

Polygonum lapathifolium and/or *Xanthium strumarium* or other knotweed species are dominant or co-dominant in the herbaceous layer with *Bidens frondose*, *Cuscuta pentagona*, *Echinochloa* spp., *Eleocharis macrostachya*, *Euthamia occidentalis*, *Helianthus annuus*, *Phyla nodiflora*, and *Polygonum* spp.

This alliance was cited as *Persicaria lapathifolia* - *Xanthium strumarium* Provisional Herbaceous Alliance in the 2009 book, *A Manual of California Vegetation*, second edition. The main diagnostic species in this alliance are considered native to California and North America, but all (including *Helianthus annuus*) are globally widespread due to their weedy nature. This is an example of an annual ruderal alliance with native diagnostic species.

Local Vegetation Description

The Smartweed – cocklebur patches Alliance forms an open to continuous herbaceous layer. The shrub layer is sparse and the tree layer is absent. Dominant herbs include *Polygonum amphibium*. Herbs that are sometimes present include *Agrostis avenacea*, *Alisma lanceolatum*, *Cardamine oligosperma*, *Carex obnupta*, *Centaurium*

muehlenbergii, *Cyperus eragrostis*, *Eleocharis macrostachya*, *Euthamia occidentalis*, *Helenium puberulum*, *Hirschfeldia incana*, *Holcus lanatus*, *Juncus effusus*, *Ludwigia* spp., *Myriophyllum aquaticum*, *Polygonum argyrocoleon*, *Polypogon monspeliensis*, *Pseudognaphalium luteoalbum*, *Schoenoplectus acutus*, *Typha angustifolia*, *Typha latifolia*, and *Xanthium strumarium*.

Commonly associated emergent shrubs at sparse cover include *Rubus ursinus* and *Toxicodendron diversilobum*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.1	0 – 0.2	0.8	0.5 – 1
Herb	73.8	30 – 95	0.8	0 – 2

Local Membership Rule

Persicaria (= *Polygonum*) spp., *Alisma* spp., and/or *Xanthium strumarium* dominate in marshes and regularly disturbed vernal wet ponds, fields, and stream terraces.

Local Environmental Description

Elevation: Mean 79 m, Range 52 – 110 m

Aspect: Flat (2), NE (1), NW (1)

Slope: Mean 1 degrees, Range 0 – 3 degrees

Macro Topography: Bottom (3), Lower 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 20.3%, Range 0.0 – 58.0%

Litter Cover: Mean 52.5%, Range 0.0 – 85%

Soil Texture (field assessed): Not recorded (2), Fine silty clay (1), Muck (1)

Geology (field or map data): Franciscan melange (2), Mixed alluvium (1)

San Mateo County Watersheds: Palo Alto (1), San Mateo Bayside (1)

Other Watersheds, Marin Co.: Lagunitas Creek (1), Novato (1)

Site Impacts

This alliance has low non-native plant cover (average 1.2%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Agrostis avenacea*, *Alisma lanceolatum*, *Hirschfeldia incana*, *Holcus lanatus*, *Myriophyllum aquaticum*, *Polygonum argyrocoleon*, *Polypogon monspeliensis*, and *Pseudognaphalium luteoalbum*.

Associations in San Mateo County

- *Polygonum (amphibium, lapathifolium)*

Polygonum lapathifolium – *Xanthium strumarium* Herbaceous Alliance

Classification Comments

Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: Buck-Diaz et al. 2011, Buck-Diaz et al. 2012, Buck-Diaz et al. 2013

Global Rarity Rank: G5

State Rarity Rank: S4

Surveys Used for Description

Total: N=4; San Mateo County (n=2): SMAT0207, SMAT0241

Marin County (n=2): MARIN105, MARIN114

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Rubus ursinus</i>	25.0	12.5	0.1	0.2	0.2				
	<i>Toxicodendron diversilobum</i>	25.0	12.5	0.1	0.2	0.2				
Herb	<i>Polygonum amphibium</i>	100.0	84.9	62.5	30	90	Y	Y		Y
	<i>Eleocharis macrostachya</i>	25.0	11.7	9.5	38	38				
	<i>Xanthium strumarium</i>	25.0	0.9	0.8	3	3				
	<i>Carex obnupta</i>	25.0	0.5	0.5	2	2				
	<i>Holcus lanatus</i>	25.0	0.3	0.3	1	1				
	<i>Polypogon monspeliensis</i>	25.0	0.3	0.3	1	1				
	<i>Typha latifolia</i>	25.0	0.3	0.3	1	1				
	<i>Agrostis avenacea</i>	25.0	0.3	0.3	1	1				
	<i>Schoenoplectus acutus</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Pseudognaphalium luteoalbum</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Typha angustifolia</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Polygonum argyrocoleon</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Myriophyllum aquaticum</i>	25.0	0.2	0.1	0.2	0.2				
	<i>Alisma lanceolatum</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Cardamine oligosperma</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Centaurium muehlenbergii</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Cyperus eragrostis</i>	25.0	0.1	0.1	0.2	0.2				
<i>Euthamia occidentalis</i>	25.0	0.1	0.1	0.2	0.2					

<i>Helenium puberulum</i>	25.0	0.1	0.1	0.2	0.2
<i>Hirschfeldia incana</i>	25.0	0.1	0.1	0.2	0.2
<i>Juncus effusus</i>	25.0	0.1	0.1	0.2	0.2
<i>Ludwigia spp.</i>	25.0	0.2	0.1	0.2	0.2

Polygonum (amphibium, lapathifolium) Association

Common Name: Knotweed Patches

Alliance: *Polygonum lapathifolium – Xanthium strumarium* Herbaceous Alliance

Classification Comments

The association circumscription is the same as that of the alliance for the county. See above for detailed description.

References: Buck-Diaz et al. 2012

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: N

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Rubus ursinus</i>	25.0	12.5	0.1	0.2	0.2				
	<i>Toxicodendron diversilobum</i>	25.0	12.5	0.1	0.2	0.2				
Herb	<i>Polygonum amphibium</i>	100.0	84.9	62.5	30	90		Y		Y
	<i>Eleocharis macrostachya</i>	25.0	11.7	9.5	38	38				
	<i>Xanthium strumarium</i>	25.0	0.9	0.8	3	3				
	<i>Carex obnupta</i>	25.0	0.5	0.5	2	2				
	<i>Typha latifolia</i>	25.0	0.3	0.3	1	1				
	<i>Polypogon monspeliensis</i>	25.0	0.3	0.3	1	1				
	<i>Holcus lanatus</i>	25.0	0.3	0.3	1	1				
	<i>Agrostis avenacea</i>	25.0	0.3	0.3	1	1				
	<i>Ludwigia spp.</i>	25.0	0.2	0.1	0.2	0.2				
	<i>Myriophyllum aquaticum</i>	25.0	0.2	0.1	0.2	0.2				
	<i>Polygonum argyrocoleon</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Alisma lanceolatum</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Euthamia occidentalis</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Centaurium muehlenbergii</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Cardamine oligosperma</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Cyperus eragrostis</i>	25.0	0.1	0.1	0.2	0.2				
<i>Hirschfeldia incana</i>	25.0	0.1	0.1	0.2	0.2					
<i>Juncus effusus</i>	25.0	0.1	0.1	0.2	0.2					

Polygonum lapathifolium – Xanthium strumarium Herbaceous Alliance

<i>Schoenoplectus acutus</i>	25.0	0.1	0.1	0.2	0.2
<i>Typha angustifolia</i>	25.0	0.1	0.1	0.2	0.2
<i>Pseudognaphalium luteoalbum</i>	25.0	0.1	0.1	0.2	0.2
<i>Helenium puberulum</i>	25.0	0.1	0.1	0.2	0.2

***Sarcocornia pacifica* (*Salicornia depressa*) Herbaceous Alliance**



Common Name: Pickleweed mats

NVC Alliance Code: A3902. *Sarcocornia pacifica* - *Spartina foliosa* - *Glaux maritima*
Salt Marsh Alliance

Statewide Description

Salicornia depressa, *Sarcocornia pacifica*, and/or *Frankenia salina* is dominant or co-dominant in the subshrub and herbaceous layers with algae and *Atriplex patula*, *Atriplex prostrata*, *Batis maritima*, *Bolboschoenus maritimus*, *Cotula coronopifolia*, *Crypsis schoenoides*, *Cuscuta salina*, *Distichlis spicata*, *Echinochloa crus-galli*, *Frankenia salina*, *Grindelia stricta*, *Jaumea carnosa*, *Juncus* spp., *Lepidium latifolium*, *Limonium californicum*, *Monanthochloe littoralis*, *Persicaria lapathifolia*, *Sesuvium verrucosum*, *Spartina foliosa*, *Suaeda esteroa*, *Suaeda taxifolia*, *Triglochin maritima*, and *Xanthium strumarium*.

In northern California, *Sarcocornia pacifica* co-dominates with *Cuscuta salina* in the high marsh zone, slightly above the zones dominated by the non-native grass *Spartina densiflora*. In central California, *Sarcocornia pacifica* dominates in high- and mid-marsh zones above the zones dominated by the native grass *Spartina foliosa*. In southern California, Zedler et al. (1999) stated that elevation profiles and vegetation patterns do not have discrete zonation, but they recognize three habitats: high marsh, marsh plain, and cordgrass habitat. In the high marsh, *Sarcocornia pacifica* is associated with

Arthrocnemum subterminale and *Cuscuta salina*; the marsh plain is dominated by *Batis maritima*, *Distichlis spicata*, *Monanthochloe littoralis*, and *Sarcocornia pacifica*. General descriptions are found in Grewell et al. (2007).

Local Vegetation Description

The Pickleweed mats Alliance forms an open to continuous herbaceous layer. The shrub layer is sparse and the tree layer is absent. Dominant herbs include *Sarcocornia pacifica* and/or *Frankenia salina*, and characteristic herbs include *Distichlis spicata* and *Jaumea carnosa*. Those herbs often present include *Grindelia stricta* and *Limonium californicum*, and herbs that are sometimes present include *Cuscuta salina*, *Puccinellia* spp., and *Spartina foliosa*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.0	0 – 0.2	0.7	0 – 1
Herb	79.5	35 – 93	0.3	0 – 0.5

Local Membership Rule

Sarcocornia pacifica dominates or co-dominates with *Distichlis spicata*, *Jaumea carnosa*, and/or *Lepidium latifolium*. Stands found in coastal salt marshes, alkali flats, and wetland mudflats.

Local Environmental Description

Elevation: Mean 4 m, Range 0 – 12 m

Aspect: Flat (16)

Slope: Mean 0 degrees, Range 0 – 1 degrees

Macro Topography: Bottom (16)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 54.9%, Range 2.0 – 98.0%

Litter Cover: Mean 39.6%, Range 0.2 – 96%

Soil Texture (field assessed): Muck (15), Unknown (1)

Geology (field or map data): Clayey alluvium (5), Mixed alluvium (5), Sandy alluvium (most alluvial fans and washes) (2), Sandstone, shale, and conglomerate (1), Sandstone and other sedimentary (1)

San Mateo County Watersheds: San Mateo Bayside (10), Pescadero Creek (3), Palo Alto (2), Pacifica (1)

Site Impacts

This alliance has very low non-native plant cover (average 0.6%) relative to native cover.

Associations in San Mateo County

- *Frankenia salina* – *Limonium californicum* – *Monanthochloe littoralis* – *Sarcocornia pacifica*
- *Sarcocornia pacifica* – *Jaumea carnosa* – *Distichlis spicata*
- *Sarcocornia pacifica* Tidal

Classification Comments

None.

References: Atwater et al. 1979, Buck and Evens 2010, Buck-Diaz et al. 2012, Duke et al. 1999, Eicher 1987, Hickson and Keeler-Wolf 2007, Keeler-Wolf and Evens 2006, Keeler-Wolf and Vaghti 2000, Klein et al. 2015, Newton 1989, Peinado et al. 1994, Sproul et al. 2011

Global Rarity Rank: G4

State Rarity Rank: S3

Surveys Used for Description

Total: N=16; San Mateo County (n=16): SMAT0028, SMAT0029, SMAT0103, SMAT0129, SMAT0132, SMAT0189, SMAT0190, SMAT0193, SMAT0194, SMAT0195, SMAT0221, SMAT0223, SMAT0309, SMAT0310, SMATREL0135, SMATREL0192

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Sarcocornia pacifica</i>	100.0	55.8	44.8	1	89	Y	Y		Y
	<i>Distichlis spicata</i>	81.3	5.5	4.7	0.2	38	Y			Y
	<i>Jaumea carnosa</i>	75.0	3.1	2.1	0.2	15	Y			Y
	<i>Frankenia salina</i>	68.8	16.0	14.2	0.2	91				Y
	<i>Grindelia stricta</i>	62.5	1.5	1.4	0.2	10				Y
	<i>Limonium californicum</i>	50.0	1.1	0.9	0.11	10				Y
	<i>Spartina foliosa</i>	37.5	10.7	8.9	0.2	55				
	<i>Cuscuta salina</i>	31.3	0.1	0.1	0.2	0.2				
	<i>Puccinellia spp.</i>	25.0	3.6	2.2	0.2	35				

***Frankenia salina* – *Limonium californicum* – *Monanthochloe littoralis* – *Sarcocornia pacifica* Association**

Common Name: Alkali Heath – Western Marsh-Rosemary – Shore Grass – Pacific Glasswort Patches

Alliance: *Sarcocornia pacifica* (*Salicornia depressa*) Herbaceous Alliance

Local Vegetation Description

The Alkali Heath – Western Marsh-Rosemary – Shore Grass – Pacific Glasswort Association forms a continuous herbaceous layer. The shrub layer is absent and the tree layer is absent. Dominant herbs include *Frankenia salina*, and characteristic herbs include *Grindelia stricta*, and *Sarcocornia pacifica*. Herbs often present include *Distichlis spicata*, *Limonium californicum*, and *Limonium ramosissimum*, and herbs that are sometimes present include *Achillea millefolium*, *Jaumea carnosa*, *Juncus arcticus*, *Polypogon monspeliensis*, *Potentilla anserina*, *Pseudognaphalium luteoalbum*, *Puccinellia* spp., *Rumex occidentalis*, *Sonchus asper*, and *Triglochin maritima*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.0	0 – 0	no data	no data
Herb	88.3	77 – 95	0.4	0 – 1

Local Environmental Description

Elevation: Mean 8 m, Range 6 – 12 m

Aspect: Flat (3)

Slope: Mean 0 degrees, Range 0 – 0 degrees

Macro Topography: Bottom (3)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 21.3%, Range 2.0 – 57.0%

Litter Cover: Mean 74.7%, Range 40 – 94%

Soil Texture (field assessed): Muck (2), Unknown (1)

Geology (field or map data): Mixed alluvium (1), Sandstone, shale, and conglomerate (1), Sandy alluvium (most alluvial fans and washes) (1)

San Mateo County Watersheds: San Mateo Bayside (2), Pescadero Creek (1)

Site Impacts

This association has low non-native plant cover (average 2.4%) relative to native cover.

Frankenia salina – *Limonium californicum* – *Monanthochloe littoralis* – *Sarcocornia pacifica* Association
Sarcocornia pacifica (*Salicornia depressa*) Herbaceous Alliance

Non-native species that occur with highest frequency and abundance include *Limonium ramosissimum*.

Classification Comments

This association has been moved to a new alliance. It was previously placed in the *Frankenia salina* Alliance which is now limited to inland regions.

References: Keeler-Wolf and Evens 2006

Global Rarity Rank: G3 **State Rarity Rank:** S2? **State Rare:** Y

Surveys Used for Description

Total: N=3; San Mateo County (n=3): SMAT0132, SMAT0194, SMAT0195

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Frankenia salina</i>	100.0	80.6	72.0	55	91		Y		Y
	<i>Grindelia stricta</i>	100.0	4.7	4.3	1	10				Y
	<i>Sarcocornia pacifica</i>	100.0	3.4	3.0	1	5				Y
	<i>Limonium californicum</i>	66.7	4.7	3.7	1	10				Y
	<i>Limonium ramosissimum</i>	66.7	2.2	1.7	0.2	5				Y
	<i>Distichlis spicata</i>	66.7	2.0	1.7	2	3				Y
	<i>Potentilla anserina</i>	33.3	1.1	1.0	3	3				
	<i>Rumex occidentalis</i>	33.3	0.4	0.3	1	1				
	<i>Juncus arcticus</i>	33.3	0.4	0.3	1	1				
	<i>Puccinellia spp.</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Jaumea carnosa</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Pseudognaphalium luteoalbum</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Sonchus asper</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Polypogon monspeliensis</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Achillea millefolium</i>	33.3	0.1	0.1	0.2	0.2				
	<i>Triglochin maritima</i>	33.3	0.1	0.1	0.2	0.2				

***Sarcocornia pacifica* – *Jaumea carnosa* – *Distichlis spicata* Association**

Common Name: Pacific Glasswort – Saltgrass – Marsh Jaumea Tidal Salt

Marsh Patches

Alliance: *Sarcocornia pacifica* (*Salicornia depressa*) Herbaceous Alliance

Local Vegetation Description

The Pacific Glasswort – Saltgrass – Marsh Jaumea Tidal Salt Marsh Association forms an intermittent to continuous herbaceous layer. The shrub layer is sparse and the tree layer is absent. Dominant herbs include *Sarcocornia pacifica*, and characteristic herbs include *Distichlis spicata*, *Frankenia salina*, *Jaumea carnosa*, and *Limonium californicum*. Those herbs often present include *Grindelia stricta*, and herbs that are sometimes present include *Cuscuta salina*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	1.2	0.0 – 5.0	0.6	0 – 1
Herb	81.0	60 – 90	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 4 m, Range 2 – 6 m

Aspect: Flat (5)

Slope: Mean 0 degrees, Range 0 – 0 degrees

Macro Topography: Bottom (5)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 61.8%, Range 2.0 – 85.0%

Litter Cover: Mean 31.8%, Range 5.0 – 96%

Soil Texture (field assessed): Muck (5)

Geology (field or map data): Mixed alluvium (3), Clayey alluvium (2)

San Mateo County Watersheds: San Mateo Bayside (3), Palo Alto (1), Pescadero Creek (1)

Site Impacts

This association has very low non-native plant cover (average 0.2%) relative to native cover.

Classification Comments

None.

References: Buck and Evens 2010, Eicher 1987, Keeler-Wolf and Evens 2006, Klein et al. 2015, Newton 1989

Global Rarity Rank: G3 **State Rarity Rank:** S3 **State Rare:** Y

Surveys Used for Description

Total: N=5; San Mateo County (n=5): SMAT0028, SMAT0193, SMAT0310, SMATREL0135, SMATREL0192

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Sarcocornia pacifica</i>	100.0	58.5	51.0	10	80		Y		Y
	<i>Distichlis spicata</i>	100.0	14.5	12.6	0.2	38				Y
	<i>Jaumea carnosa</i>	80.0	5.8	3.8	1	15				Y
	<i>Frankenia salina</i>	80.0	1.9	1.7	0.2	5				Y
	<i>Limonium californicum</i>	80.0	0.6	0.5	0.11	1				Y
	<i>Grindelia stricta</i>	60.0	1.3	1.2	0.2	5				Y
	<i>Cuscuta salina</i>	40.0	0.1	0.1	0.2	0.2				

***Sarcocornia pacifica* Tidal Association**

Common Name: Pacific Glasswort Tidal Patches

Alliance: *Sarcocornia pacifica* (*Salicornia depressa*) Herbaceous Alliance

Local Vegetation Description

The Pacific Glasswort Tidal Association forms an intermittent to continuous herbaceous layer. The shrub layer is sparse and the tree layer is sparse. Dominant herbs include *Sarcocornia pacifica*, and characteristic herbs include *Distichlis spicata* and *Jaumea carnosa*. Those herbs often present include *Frankenia salina*, *Grindelia stricta*, and *Spartina foliosa*, and herbs that are sometimes present include *Atriplex prostrata*, *Cuscuta salina*, *Limonium californicum*, and *Puccinellia* spp.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.1	0 – 1	0.8	0.5 – 1
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.1	0.0 – 0.2	0.8	0.5 – 1
Herb	77.5	35 – 90	0.3	0 – 0.5

Local Environmental Description

Elevation: Mean 3 m, Range 0 – 10 m

Aspect: Flat (8)

Slope: Mean 0 degrees, Range 0 – 1 degrees

Macro Topography: Bottom (8)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 63.1%, Range 15.0 – 98.0%

Litter Cover: Mean 31.4%, Range 0.2 – 80%

Soil Texture (field assessed): Muck (8)

Geology (field or map data): Clayey alluvium (3), Sandy alluvium (most alluvial fans and washes) (1), Sandstone and other sedimentary (1), Mixed alluvium (1)

San Mateo County Watersheds: San Mateo Bayside (5), Pacifica (1), Palo Alto (1), Pescadero Creek (1)

Site Impacts

This association has very low non-native plant cover (average 0.2%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Atriplex prostrata*.

Classification Comments

None.

References: Atwater et al. 1979, Duke et al. 1999, Keeler-Wolf and Vaghti 2000, Klein et al. 2015, Peinado et al. 1994, Sproul et al. 2011

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Surveys Used for Description

Total: N=8; San Mateo County (n=8): SMAT0029, SMAT0103, SMAT0129, SMAT0189, SMAT0190, SMAT0221, SMAT0223, SMAT0309

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb										
	<i>Sarcocornia pacifica</i>	100.0	73.7	56.5	30	89		Y		Y
	<i>Jaumea carnosa</i>	87.5	2.4	1.9	0.2	10				Y
	<i>Distichlis spicata</i>	75.0	1.2	0.9	0.2	3				Y
	<i>Spartina foliosa</i>	62.5	21.4	17.8	0.2	55				Y
	<i>Frankenia salina</i>	50.0	0.5	0.4	0.2	2				Y
	<i>Grindelia stricta</i>	50.0	0.3	0.3	0.2	1				Y
	<i>Cuscuta salina</i>	37.5	0.1	0.1	0.2	0.2				
	<i>Atriplex prostrata</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Puccinellia spp.</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Limonium californicum</i>	25.0	0.1	0.1	0.2	0.2				

***Schoenoplectus (acutus, californicus)* Herbaceous Alliance**



Common Name: Hardstem and California bulrush marshes

NVC Alliance Code: A3895. *Schoenoplectus americanus* - *Schoenoplectus acutus* - *Schoenoplectus californicus* Marsh Alliance

Statewide Description

Schoenoplectus acutus and/or *S. californicus* is dominant or co-dominant in the herbaceous layer with *Apocynum cannabinum*, *Azolla filiculoides*, *Bolboschoenus maritimus*, *Calystegia sepium*, *Eichhornia crassipes*, *Euthamia occidentalis*, *Hibiscus lasiocarpus*, *Hoita macrostachya*, *Hydrocotyle ranunculoides*, *Leersia oryzoides*, *Ludwigia peploides*, *Lycopus americanus*, *Persicaria punctata*, *Phragmites australis*, *Sparganium eurycarpum*, *Triglochin* spp., *Typha* spp., and *Urtica dioica*. Emergent trees and shrubs may be present at low cover, including trees: *Alnus rhombifolia*, *Populus fremontii*, or *Salix gooddingii*, and shrubs: *Cephalanthus occidentalis*, *Rubus armeniacus*, *Salix exigua*, or *Salix lasiolepis*.

The alliance is a widespread, freshwater to slightly brackish marsh type, typical of marshes throughout much of North America (NatureServe 2007a). Although *Schoenoplectus acutus* and *S. californicus* commonly occur in the same area, *S. acutus* is less tolerant of brackish conditions than is *S. californicus*, and associations dominated by *S. acutus* are not found regularly on the edges of large stretches of open water (Grewell et al. 2007). *S. californicus* tends to dominate on the outer, more-exposed edges of marshes adjacent to open water. However, both species also can co-dominate in stands.

Local Vegetation Description

The Hardstem and California bulrush marshes Alliance forms an open to continuous herbaceous layer. The shrub layer is open and the tree layer is absent. Those herbs often present include *Schoenoplectus californicus*, and herbs that are sometimes present include *Conium maculatum*, *Cyperus eragrostis*, *Eleocharis macrostachya*, *Euthamia occidentalis*, *Helenium puberulum*, *Juncus effusus*, *Lotus corniculatus*, *Polygonum amphibium*, *Polygonum punctatum*, *Potentilla anserina*, *Rorippa curvisiliqua*, *Rumex crispus*, *Schoenoplectus acutus*, *Typha latifolia*, and *Urtica dioica*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	2.2	0 – 10	3.0	0 – 10
Herb	65.7	25 – 75	2.4	0 – 5

Local Membership Rule

Schoenoplectus acutus or *Schoenoplectus californicus* dominates or co-dominates with other herbs including *Typha* spp. Occurs in both freshwater and tidal marshes, along ponds and lagoons.

Local Environmental Description

Elevation: Mean 72 m, Range 11 – 140 m

Aspect: Flat (6)

Slope: 0 degrees

Macro Topography: Bottom (4), Lower 1/3 of slope (1), Bottom to Lower 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 3.7%, Range 0.0 – 16.0%

Litter Cover: Mean 62.2%, Range 47.0 – 81%

Soil Texture (field assessed): Muck (6)

Geology (field or map data): Mixed alluvium (3), Alluvium (2), Franciscan melange (2)

San Mateo County Watersheds: San Mateo Bayside (4), Ano Nuevo (3), Pescadero Creek (1)

Site Impacts

This alliance has low non-native plant cover (average 2.0%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Conium maculatum*, *Lotus corniculatus*, and *Rumex crispus*.

Associations in San Mateo County

- *Schoenoplectus acutus*

- *Schoenoplectus californicus*

Classification Comments

None.

References: AECOM 2013, Buck-Diaz et al. 2012, Hickson and Keeler-Wolf 2007, Keeler-Wolf and Vaghti 2000, Klein and Evens 2005, Klein et al. 2015, Reyes et al. 2020a, Sproul et al. 2011, VegCAMP 2015a

Global Rarity Rank: GNR **State Rarity Rank:** S3S4

Surveys Used for Description

Total: N=8; San Mateo County (n=8): PGA1796, PWFWM03, SMAT0043, SMAT0110, SMAT0142, SMAT0208, SMAT0209, SMAT0211

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Rubus ursinus</i>	37.5	22.2	1.5	0.2	10				
	<i>Salix lasiolepis</i>	25.0	20.3	0.5	1	3				
	<i>Toxicodendron diversilobum</i>	25.0	4.4	0.2	0.2	1				
Herb	<i>Schoenoplectus californicus</i>	62.5	49.2	31.8	25	72				Y
	<i>Schoenoplectus acutus</i>	37.5	24.1	14.4	10	70				
	<i>Polygonum amphibium</i>	37.5	3.3	2.7	0.2	20				
	<i>Typha latifolia</i>	37.5	1.8	1.5	0.2	10				
	<i>Cyperus eragrostis</i>	37.5	0.2	0.1	0.2	0.2				
	<i>Rumex crispus</i>	37.5	0.2	0.1	0.2	0.2				
	<i>Polygonum punctatum</i>	37.5	0.2	0.1	0.2	0.2				
	<i>Potentilla anserina</i>	25.0	0.5	0.4	0.2	3				
	<i>Euthamia occidentalis</i>	25.0	0.4	0.3	0.2	2				
	<i>Conium maculatum</i>	25.0	0.3	0.3	0.2	2				
	<i>Juncus effusus</i>	25.0	0.3	0.3	0.2	2				
	<i>Helenium puberulum</i>	25.0	0.3	0.2	0.2	1				
	<i>Lotus corniculatus</i>	25.0	0.2	0.1	0.2	0.2				
	<i>Urtica dioica</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Rorippa curvisiliqua</i>	25.0	0.1	0.1	0.2	0.2				
<i>Eleocharis macrostachya</i>	25.0	0.2	0.1	0.2	0.2					

***Schoenoplectus acutus* Association**

Common Name: Common Tule Patches

Alliance: *Schoenoplectus (acutus, californicus)* Herbaceous Alliance

Local Vegetation Description

The Common Tule Association forms a continuous herbaceous layer. The shrub layer is sparse and the tree layer is absent. Dominant herbs include *Schoenoplectus acutus*. Those herbs often present include *Distichlis spicata* and *Polygonum punctatum*, and herbs that are sometimes present include *Atriplex prostrata*, *Cyperus eragrostis*, *Eleocharis macrostachya*, *Euthamia occidentalis*, *Frankenia salina*, *Grindelia stricta*, *Helenium puberulum*, *Jaumea carnosa*, *Juncus effusus*, *Lotus corniculatus*, *Polygonum amphibium*, *Rorippa curvisiliqua*, *Rumex crispus*, and *Typha latifolia*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	1.5	0.0 – 3.0	0.8	0.5 – 1
Herb	72.5	70 – 75	3.5	2 – 5

Local Environmental Description

Elevation: Mean 94 m, Range 87 – 99 m

Aspect: Flat (2)

Slope: Mean 0 degrees, Range 0 – 0 degrees

Macro Topography: Bottom (2)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: 0.0%

Litter Cover: Mean 62.0%, Range 47.0 – 77%

Soil Texture (field assessed): Muck (2)

Geology (field or map data): Mixed alluvium (2), Franciscan melange (1)

San Mateo County Watersheds: San Mateo Bayside (3)

Site Impacts

This association has low non-native plant cover (average 5.1%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Atriplex prostrata*, *Lotus corniculatus*, and *Rumex crispus*.

Classification Comments

Schoenoplectus acutus Association
Schoenoplectus (acutus, californicus) Herbaceous Alliance

None.

References: AECOM 2013, Buck-Diaz et al. 2012, Hickson and Keeler-Wolf 2007, Klein and Evens 2005, Klein et al. 2015, Reyes et al. 2020a, Sproul et al. 2011, VegCAMP 2015a

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Surveys Used for Description

Total: N=3; San Mateo County (n=3): PWFWM03, SMAT0208, SMAT0209

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Rubus ursinus</i>	33.3	22.2	0.7	2	2				
	<i>Toxicodendron diversilobum</i>	33.3	11.1	0.3	1	1				
Herb	<i>Schoenoplectus acutus</i>	100.0	64.3	38.3	10	70		Y		Y
	<i>Polygonum punctatum</i>	100.0	0.5	0.2	0.2	0.2				Y
	<i>Euthamia occidentalis</i>	66.7	1.2	0.7	0.2	2				Y
	<i>Typha latifolia</i>	66.7	0.9	0.7	0.2	2				Y
	<i>Helenium puberulum</i>	66.7	0.7	0.4	0.2	1				Y
	<i>Polygonum amphibium</i>	66.7	0.5	0.4	0.2	1				Y
	<i>Cyperus eragrostis</i>	66.7	0.4	0.1	0.2	0.2				Y
	<i>Lotus corniculatus</i>	66.7	0.4	0.1	0.2	0.2				Y
	<i>Rumex crispus</i>	66.7	0.4	0.1	0.2	0.2				Y
	<i>Eleocharis macrostachya</i>	66.7	0.4	0.1	0.2	0.2				Y
	<i>Rorippa curvisiliqua</i>	66.7	0.2	0.1	0.2	0.2				Y
	<i>Typha angustifolia</i>	33.3	10.1	8.3	25	25				
	<i>Veronica peregrina ssp. xalapensis</i>	33.3	5.2	1.0	3	3				
	<i>Deschampsia danthonioides</i>	33.3	5.2	1.0	3	3				
	<i>Juncus arcticus</i>	33.3	1.2	1.0	3	3				
	<i>Carex obnupta</i>	33.3	1.2	1.0	3	3				
	<i>Conium maculatum</i>	33.3	0.8	0.7	2	2				
<i>Holcus lanatus</i>	33.3	0.8	0.7	2	2					
<i>Juncus effusus</i>	33.3	0.8	0.7	2	2					
<i>Agrostis avenacea</i>	33.3	0.8	0.7	2	2					
<i>Hordeum murinum</i>	33.3	0.3	0.1	0.2	0.2					

Schoenoplectus acutus Association
Schoenoplectus (acutus, californicus) Herbaceous Alliance

<i>Xanthium strumarium</i>	33.3	0.3	0.1	0.2	0.2
<i>Rorippa curvipes</i>	33.3	0.3	0.1	0.2	0.2
<i>Polypogon maritimus</i>	33.3	0.3	0.1	0.2	0.2
<i>Lythrum hyssopifolium</i>	33.3	0.3	0.1	0.2	0.2
<i>Phyla nodiflora</i>	33.3	0.3	0.1	0.2	0.2
<i>Epilobium ciliatum</i>	33.3	0.3	0.1	0.2	0.2
<i>Eleocharis acicularis</i>	33.3	0.3	0.1	0.2	0.2
<i>Mentha pulegium</i>	33.3	0.3	0.1	0.2	0.2
<i>Lolium perenne</i>	33.3	0.3	0.1	0.2	0.2
<i>Geranium dissectum</i>	33.3	0.1	0.1	0.2	0.2
<i>Juncus phaeocephalus</i>	33.3	0.1	0.1	0.2	0.2
<i>Cirsium vulgare</i>	33.3	0.1	0.1	0.2	0.2
<i>Dipsacus spp.</i>	33.3	0.1	0.1	0.2	0.2
<i>Centaurium muehlenbergii</i>	33.3	0.1	0.1	0.2	0.2

***Schoenoplectus californicus* Association**

Common Name: California Bulrush Patches

Alliance: *Schoenoplectus (acutus, californicus)* Herbaceous Alliance

Local Vegetation Description

The California Bulrush Association forms an open to continuous herbaceous layer. The shrub layer is open and the tree layer is sparse. Dominant herbs include *Schoenoplectus californicus*. Those herbs that are sometimes present include *Potentilla anserina* and *Urtica dioica*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	2.2	0.0 – 10.0	4.7	0 – 10
Herb	63.0	25 – 75	1.9	0 – 5

Local Environmental Description

Elevation: Mean 59 m, Range 11 – 140 m

Aspect: Flat (4)

Slope: Mean 0 degrees, Range 0 – 0 degrees

Macro Topography: Bottom (2), Bottom to Lower 1/3 of slope (1), Lower 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 5.5%, Range 0.0 – 16.0%

Litter Cover: Mean 62.3%, Range 47.0 – 81%

Soil Texture (field assessed): Muck (4)

Geology (field or map data): Alluvium (2), Franciscan melange (1), Mixed alluvium (1)

San Mateo County Watersheds: Ano Nuevo (3), Pescadero Creek (1), San Mateo Bayside (1)

Site Impacts

This association has very low non-native plant cover (average 0.1%) relative to native cover.

Classification Comments

None.

References: Buck-Diaz et al. 2012, Keeler-Wolf and Vaghti 2000, Klein et al. 2015, Sproul et al. 2011

Global Rarity Rank: GNR **State Rarity Rank:** SNR **State Rare:** Y

Schoenoplectus californicus Association
Schoenoplectus (acutus, californicus) Herbaceous Alliance

Surveys Used for Description

Total: N=5; San Mateo County (n=5): PGA1796, SMAT0043, SMAT0110, SMAT0142, SMAT0211

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Salix lasiolepis</i>	40.0	32.5	0.8	1	3				
	<i>Rubus ursinus</i>	40.0	22.1	2.0	0.2	10				
Herb	<i>Schoenoplectus californicus</i>	100.0	78.7	50.8	25	72		Y		Y
	<i>Potentilla anserina</i>	40.0	0.8	0.6	0.2	3				
	<i>Urtica dioica</i>	40.0	0.1	0.1	0.2	0.2				

***Sedum spathulifolium* Herbaceous Provisional Alliance**



Common Name: Coast Range stonecrop draperies

NVC Alliance Code: A3784. *Sedum spathulifolium* Sparse Rock Vegetation Alliance

Statewide Description

Sedum spathulifolium is dominant in the herbaceous layer with *Bromus rubens*, *Clarkia* spp., *Dichelostemma capitatum*, *Dudleya lanceolata*, *Erigeron petrophilus*, *Galium aparine*, *Melica torreyana*, *Pentagramma triangularis*, and *Polypodium californicum*. Emergent tree bonsai or shrubs may be present at low cover, including the shrubs *Galium porrigens* or *Heteromeles arbutifolia*.

Stands are typically small (< 0.5 ha), with the largest sampled so far at Pinnacles National Monument (NatureServe 2007b). In the future, we need information on species composition of nonvascular plants as well. They may be the diagnostic species if vegetation occurs on these rocky environments. Rock climbing and informal trails have impacted some stands negatively.

Local Vegetation Description

The Coast Range stonecrop draperies Alliance forms an open to continuous herbaceous layer. The shrub layer is open and the tree layer is absent. Dominant herbs include *Polypodium californicum* and *Sedum spathulifolium*. Those herbs often present include *Aira praecox*, *Dudleya farinosa*, and *Hypochaeris radicata*, and herbs that are

sometimes present include *Bromus diandrus*, *Eriophyllum stoechadifolium*, *Plantago lanceolata*, *Poa secunda*, *Rumex acetosella*, and *Vulpia bromoides*. Commonly associated emergent shrubs include *Baccharis pilularis*. Commonly associated non-vascular plants include Lichen and Moss.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	2.0	0 – 10	0.6	0 – 2
Herb	43.2	5 – 90	0.3	0 – 0.5

Local Membership Rule

Sedum spathulifolium and/or *Polypodium* spp. dominate small stands on steep north-facing rock outcrops and vertical cliff faces. Moss and lichen species often have high cover.

Local Environmental Description

Elevation: Mean 225 m, Range 39 – 462 m

Aspect: NW (4), NE (2)

Slope: Mean 55 degrees, Range 31 – 70 degrees

Macro Topography: Upper 1/3 of slope (4), Middle to Upper 1/3 of slope (1), Upper 1/3 of slope to Ridgetop (1)

Large Rock: Mean 70.6%, Range 12.0 – 99.0%

Small Rock: Mean 7.6%, Range 0.0 – 45.0%

Fines Cover: Mean 18.4%, Range 0.2 – 87.0%

Litter Cover: Mean 2.6%, Range 0.2 – 10%

Soil Texture (field assessed): Not recorded (5), Unknown (1)

Geology (field or map data): Sandstone (3), Metamorphic (type unknown) (1), Granitic (generic) (1), Ultramafic (type unknown) (1)

San Mateo County Watersheds: Pacifica (1), San Mateo Bayside (1)

Other Watersheds, Marin Co.: Walker Creek (2), Estero San Antonio (1), Point Reyes (1)

Site Impacts

This alliance has low non-native plant cover (average 12.9%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Aira praecox*, *Bromus diandrus*, *Hypochaeris radicata*, *Plantago lanceolata*, *Rumex acetosella*, and *Vulpia bromoides*.

Associations in San Mateo County

- *Sedum spathulifolium* – *Polypodium californicum* / Lichen – Moss

Classification Comments

Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: Sawyer et al. 2009

Global Rarity Rank: G4? State Rarity Rank: S4?

Surveys Used for Description

Total: N=6; San Mateo County (n=2): SMAT0057, SMAT0158

Marin County (n=4): MARIN261, MARIN269, MARIN297, MARIN306

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub										
	<i>Baccharis pilularis</i>	50.0	10.6	0.6	0.2	3				Y
	<i>Rubus ursinus</i>	33.3	14.3	0.2	0.2	1				
	<i>Diplacus aurantiacus</i>	33.3	2.7	0.1	0.2	0.2				
Herb										
	<i>Polypodium californicum</i>	83.3	31.1	20.4	0.2	90	Y		Y	Y
	<i>Sedum spathulifolium</i>	83.3	41.1	9.7	0.2	40	Y		Y	Y
	<i>Dudleya farinosa</i>	66.7	0.9	0.1	0.2	0.2				Y
	<i>Aira praecox</i>	50.0	1.2	0.6	0.2	3				Y
	<i>Hypochaeris radicata</i>	50.0	1.0	0.1	0.2	0.2				Y
	<i>Vulpia bromoides</i>	33.3	3.2	0.7	1	3				
	<i>Eriophyllum stoechadifolium</i>	33.3	1.9	0.4	0.2	2				
	<i>Rumex acetosella</i>	33.3	0.5	0.2	0.2	1				
	<i>Bromus diandrus</i>	33.3	0.8	0.1	0.2	0.2				
	<i>Poa secunda</i>	33.3	0.8	0.1	0.2	0.2				
	<i>Plantago lanceolata</i>	33.3	0.3	0.1	0.2	0.2				
Non-Vascular										
	Lichen	100.0	66.2	28.7	1	75.4	Y	Y		Y
	Moss	83.3	33.8	12.5	0.2	38	Y		Y	Y

***Sedum spathulifolium* – *Polypodium californicum* / Lichen – Moss Provisional Association**

Common Name: Broadleaf Stonecrop – California Polypody / Lichen – Moss Patches

Alliance: *Sedum spathulifolium* Herbaceous Provisional Alliance

Classification Comments

The association circumscription is the same as that of the alliance for the county. See above for detailed description. While the alliance has been present in the MCV since 2009, the association name was first used in Marin County (Buck-Diaz et al. 2021).

References: Kittel et al. 2012, Sawyer et al. 2009

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Baccharis pilularis</i>	50.0	10.6	0.6	0.2	3				Y
	<i>Rubus ursinus</i>	33.3	14.3	0.2	0.2	1				
	<i>Diplacus aurantiacus</i>	33.3	2.7	0.1	0.2	0.2				
Herb	<i>Sedum spathulifolium</i>	83.3	41.1	9.7	0.2	40			Y	Y
	<i>Polypodium californicum</i>	83.3	31.1	20.4	0.2	90			Y	Y
	<i>Dudleya farinosa</i>	66.7	0.9	0.1	0.2	0.2				Y
	<i>Aira praecox</i>	50.0	1.2	0.6	0.2	3				Y
	<i>Hypochaeris radicata</i>	50.0	1.0	0.1	0.2	0.2				Y
	<i>Vulpia bromoides</i>	33.3	3.2	0.7	1	3				
	<i>Eriophyllum stoechadifolium</i>	33.3	1.9	0.4	0.2	2				
	<i>Bromus diandrus</i>	33.3	0.8	0.1	0.2	0.2				
	<i>Poa secunda</i>	33.3	0.8	0.1	0.2	0.2				
	<i>Rumex acetosella</i>	33.3	0.5	0.2	0.2	1				
	<i>Plantago lanceolata</i>	33.3	0.3	0.1	0.2	0.2				
	Non-Vascular	Lichen	100.0	66.2	28.7	1	75.4		Y	
Moss		83.3	33.8	12.5	0.2	38			Y	Y

***Sparganium (angustifolium)* Herbaceous Alliance**



Common Name: Mats of bur-reed leaves

NVC Alliance Code: A3893. *Hippuris vulgaris* - *Ruppia* spp. - *Sparganium* spp. Aquatic Vegetation Alliance

Statewide Description

Sparganium angustifolium or another *Sparganium* species is dominant on the water surface with *Brasenia schreberi*, *Callitriche* spp., *Carex utriculata*, *Carex vesicaria*, *Nuphar lutea*, *Potamogeton* spp., *Stuckenia* spp., *Typha* spp. and *Utricularia macrorhiza*.

Sparganium. eurycarpum grows along the coast and inland in California, but not in salt marshes. *S. natans* grows in cool, quiet, slightly acidic to somewhat basic waters of bays, pools, ditches, and fens (Kaul 2000). The vegetational relationships among the bur-reeds need clarification.

Sparganium angustifolium is common in California's mountain lakes, regularly forming stands in the middle of small ponds and near lake shorelines. The habitat setting is similar to that of *Nuphar lutea*, but *S. angustifolium* typically occupies shallower water that may fluctuate more widely during the growing season.

Local Vegetation Description

The Mats of bur-reed leaves Alliance forms a continuous herbaceous layer. The shrub layer is sparse and the tree layer is absent. Dominant herbs include *Sparganium eurycarpum*. Those herbs often present include *Oenanthe sarmentosa*, and herbs that are sometimes present include *Agrostis pallens*, *Alisma triviale*, *Carex obnupta*, *Conium maculatum*, *Eleocharis macrostachya*, *Epilobium ciliatum*, *Erechtites minimus*, *Galium triflorum*, *Juncus arcticus*, *Juncus effusus*, *Juncus lescurii*, *Juncus phaeocephalus*, *Lemna* spp., *Lythrum hyssopifolium*, *Polygonum amphibium*, *Polygonum punctatum*, *Potentilla anserina*, *Rumex acetosella*, *Rumex conglomeratus*, *Rumex crispus*, and *Schoenoplectus acutus*. Commonly associated emergent shrubs at sparse cover include *Rubus ursinus*.

Lifeform	Cover (%)	Cover (%)	Height (m)	Height (m)
	Mean	Range	Mean	Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.0	0 – 0	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.2	0 – 1	1.5	1 – 2
Herb	79.8	70 – 90	2.3	1 – 5

Local Membership Rule

Sparganium eurycarpum is dominant in wetlands with other forbs including *Agrostis pallens*, *Oenanthe sarmentosa*, and *Rumex conglomeratus*.

Local Environmental Description

Elevation: Mean 39 m, Range 5 – 69 m

Aspect: Flat (3), NW (2)

Slope: Mean 1 degrees, Range 0 – 3 degrees

Macro Topography: Bottom to Lower 1/3 of slope (2), Lower 1/3 of slope (2), Bottom (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 29.8%, Range 0.0 – 92.0%

Litter Cover: Mean 15.6%, Range 0.0 – 63%

Soil Texture (field assessed): Muck (2), Not recorded (2), Medium silt (1)

Geology (field or map data): Mixed alluvium (1), Sandstone and other sedimentary (1), Alluvium (1), Volcanic and metavolcanic rocks (1), Franciscan melange (1)

San Mateo County Watersheds: Ano Nuevo (1)

Other Watersheds, Marin Co.: Walker Creek (2), Lagunitas Creek (1), Point Reyes (1)

Site Impacts

This alliance has low non-native plant cover (average 2.0%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Conium maculatum*, *Erechtites minimus*, *Lythrum hyssopifolium*, *Rumex acetosella*, *Rumex conglomeratus*, and *Rumex crispus*.

Associations in San Mateo County

Sparganium (angustifolium) Herbaceous Alliance

- *Sparganium eurycarpum*

Classification Comments

Since the number of surveys of this alliance in San Mateo County is low, data from nearby counties were included.

References: Sawyer et al. 2009

Global Rarity Rank: G4

State Rarity Rank: S3?

Surveys Used for Description

Total: N=5; San Mateo County (n=1): SMAT0213

Marin County (n=4): MARIN073, MARIN078, MARIN259, MARIN296

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Shrub	<i>Rubus ursinus</i>	20.0	20.0	0.2	1	1				
Herb	<i>Sparganium eurycarpum</i>	100.0	77.2	65.0	55	75	Y	Y		Y
	<i>Oenanthe sarmentosa</i>	60.0	8.9	10.4	0.2	50				Y
	<i>Rumex conglomeratus</i>	40.0	1.6	1.2	0.2	6				
	<i>Polygonum punctatum</i>	40.0	0.6	0.4	0.2	2				
	<i>Juncus effusus</i>	40.0	0.3	0.2	0.2	1				
	<i>Polygonum amphibium</i>	20.0	4.7	4.0	20	20				
	<i>Agrostis pallens</i>	20.0	4.6	3.6	18	18				
	<i>Juncus lescurii</i>	20.0	0.8	0.6	3	3				
	<i>Conium maculatum</i>	20.0	0.2	0.2	1	1				
	<i>Juncus arcticus</i>	20.0	0.2	0.2	1	1				
	<i>Galium triflorum</i>	20.0	0.3	0.2	1	1				
	<i>Juncus phaeocephalus</i>	20.0	0.0	0.0	0.2	0.2				
	<i>Lemna spp.</i>	20.0	0.1	0.0	0.2	0.2				
	<i>Erechtites minimus</i>	20.0	0.1	0.0	0.2	0.2				
	<i>Rumex acetosella</i>	20.0	0.0	0.0	0.2	0.2				
	<i>Potentilla anserina</i>	20.0	0.0	0.0	0.2	0.2				
	<i>Carex obnupta</i>	20.0	0.1	0.0	0.2	0.2				
	<i>Alisma triviale</i>	20.0	0.0	0.0	0.2	0.2				
	<i>Epilobium ciliatum</i>	20.0	0.1	0.0	0.2	0.2				
	<i>Rumex crispus</i>	20.0	0.0	0.0	0.2	0.2				
	<i>Schoenoplectus acutus</i>	20.0	0.1	0.0	0.2	0.2				
	<i>Eleocharis macrostachya</i>	20.0	0.0	0.0	0.2	0.2				

Sparganium (angustifolium) Herbaceous Alliance

Lythrum hyssopifolium 20.0 0.0 0.0 0.2 0.2

***Sparganium eurycarpum* Provisional Association**

Common Name: Broadfruit Bur-reed Aquatic Vegetation Patches

Alliance: *Sparganium (angustifolium)* Herbaceous Alliance

Classification Comments

The association circumscription is the same as that of the alliance for the county. See above for detailed description. This association is considered provisional since it is under-sampled in its expected range. It was previously described from other western states, and has been added to the California classification with these surveys from Marin and San Mateo Counties.

References: NatureServe 2021, Buck-Diaz et al. 2021

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: Y

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Herb	<i>Sparganium eurycarpum</i>	100.0	77.2	65.0	55	75		Y		Y
	<i>Oenanche sarmentosa</i>	60.0	8.9	10.4	0.2	50				Y
	<i>Rumex conglomeratus</i>	40.0	1.6	1.2	0.2	6				
	<i>Polygonum punctatum</i>	40.0	0.6	0.4	0.2	2				
	<i>Juncus effusus</i>	40.0	0.3	0.2	0.2	1				

***Typha* (*angustifolia*, *domingensis*, *latifolia*) Herbaceous Alliance**



Common Name: Cattail marshes

NVC Alliance Code: A3896. *Typha domingensis* - *Typha latifolia* - *Phragmites australis* ssp. *americanus* Western Marsh Alliance

Statewide Description

Typha angustifolia, *Typha domingensis* or *Typha latifolia* is dominant or co-dominant in the herbaceous layer with *Agrostis stolonifera*, *Argentina egedii*, *Cyperus* spp., *Distichlis spicata*, *Echinochloa crus-galli*, *Eleocharis macrostachya*, *Equisetum telmateia*, *Juncus* spp., *Lemna minuta*, *Lepidium latifolium*, *Oenanthe sarmentosa*, *Persicaria lapathifolia*, *Persicaria punctata*, *Phragmites australis*, *Schoenoplectus americanus*, *Schoenoplectus californicus*, *Typha* ×*glauca*, and *Xanthium strumarium*. Emergent trees may be present at low cover, including *Salix* spp.

These species require special considerations for correct identification (see Smith 2000), and they commonly hybridize when they grow in mixed stands. Hybrids between *Typha latifolia* and *T. angustifolia* (*T. ×glauca*) are infertile, but plants are vigorous, and rhizome growth creates large clones, especially in eutrophic, disturbed habitats with unstable water levels. Hybrids between *Typha angustifolia* and *T. domingensis* are highly fertile, and colonies are locally common in the state. *T. angustifolia* was probably introduced from Europe. Its range expansion and hybridization with *T. domingensis*

make the use of plot database information difficult because of many misidentified herbarium specimens (Smith 2000).

Only a few studies in California include plot data and vegetation analysis. Most studies report mixed stands, so this alliance includes both mixed stands and those with a single dominant. This treatment emphasizes the ecological similarities of the three species, with stand differentiation at the association level. Ecological similarities also exist with stands of larger bulrushes (*Schoenoplectus acutus*, *S. californicus*). Stands where *Typha* and *Schoenoplectus* species share dominance are placed in the *Schoenoplectus* Alliances.

Local Vegetation Description

The Cattail marshes Alliance forms an intermittent to continuous herbaceous layer. The shrub layer is sparse and the tree layer is sparse. Dominant herbs include *Typha angustifolia*. Herbs often present include *Schoenoplectus californicus*, and herbs that are sometimes present include *Artemisia douglasiana*, *Carex* spp., *Juncus patens*, *Polygonum lapathifolium*, *Polygonum punctatum*, *Polygonum* spp., *Potentilla anserina*, *Rumex crispus*, *Scirpus microcarpus*, *Typha latifolia*, and *Urtica dioica*. Commonly associated emergent trees at sparse cover include *Salix laevigata*. Commonly associated emergent shrubs at sparse cover include *Toxicodendron diversilobum* and *Rubus ursinus*.

Lifeform	Cover (%) Mean	Cover (%) Range	Height (m) Mean	Height (m) Range
Conifer	0.0	0 – 0	no data	no data
Hardwood	0.3	0 – 1	no data	no data
Regenerating or Shrubby Tree	0.0	0 – 0	no data	no data
Shrub	0.8	0 – 2	2.1	0.5 – 5
Herb	56.8	33 – 80	1.5	0 – 5

Local Membership Rule

Typha latifolia, *T. angustifolia*, and/or *T. domingensis* dominate in semi-permanently flooded freshwater or brackish marshes. If *Schoenoplectus acutus* or *S. californicus* is co-dominant, key to the *Schoenoplectus* Alliance.

Local Environmental Description

Elevation: Mean 185 m, Range 6 – 619 m

Aspect: Flat (4)

Slope: 0 degrees

Macro Topography: Bottom (3), Bottom to Lower 1/3 of slope (1)

Large Rock: 0.0%

Small Rock: 0.0%

Fines Cover: Mean 3.3%, Range 1 – 5%

Litter Cover: Mean 67.3%, Range 40 – 94%

Soil Texture (field assessed): Muck (3), Moderately fine clay loam (1)

Geology (field or map data): Mixed alluvium (2), Sandstone and other sedimentary (1), Clayey alluvium (1)

San Mateo County Watersheds: Pescadero Creek (3), Palo Alto (1)

Site Impacts

This alliance has low non-native plant cover (average 9.9%) relative to native cover. Non-native species that occur with highest frequency and abundance include *Ammophila arenaria*, *Anagallis arvensis*, *Bromus catharticus*, *Bromus diandrus*, *Hypochaeris radicata*, *Rumex crispus*, and *Sonchus asper*.

Associations in San Mateo County

- *Typha (latifolia, angustifolia)*

Classification Comments

None.

References: AECOM 2013, Boul et al. 2021, Buck and Evens 2010, Buck-Diaz et al. 2012, Evens and Kentner 2006, Evens and San 2005, Evens et al. 2014, Hickson and Keeler-Wolf 2007, Junak et al. 2007, Keeler-Wolf and Vaghti 2000, Klein et al. 2007, Klein et al. 2015, Reyes et al. 2020a, Pickart 2006, Rodriguez et al. 2017, Sproul et al. 2011

Global Rarity Rank: G5

State Rarity Rank: S5

Surveys Used for Description

Total: N=4; San Mateo County (n=4): SCLAR159, SMAT0095, SMAT0137, SMAT0177

Alliance Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Salix laevigata</i>	25.0	25.0	0.3	1	1				
Shrub	<i>Rubus ursinus</i>	50.0	23.9	0.3	0.2	1				Y
	<i>Toxicodendron diversilobum</i>	50.0	14.8	0.1	0.2	0.2				Y
	<i>Salix lasiolepis</i>	25.0	11.4	0.3	1	1				
Herb	<i>Typha angustifolia</i>	75.0	39.6	17.6	0.2	50	Y		Y	Y
	<i>Schoenoplectus californicus</i>	50.0	10.9	6.3	10	15				Y

Typha (angustifolia, domingensis, latifolia) Herbaceous Alliance

<i>Typha latifolia</i>	25.0	18.2	10.0	40	40
<i>Polygonum</i>	25.0	10.5	3.8	15	15
<i>lapathifolium</i>					
<i>Scirpus microcarpus</i>	25.0	0.1	0.1	0.2	0.2
<i>Rumex crispus</i>	25.0	0.1	0.1	0.2	0.2
<i>Polygonum punctatum</i>	25.0	0.1	0.1	0.2	0.2
<i>Urtica dioica</i>	25.0	5.0	0.1	0.2	0.2
<i>Potentilla anserina</i>	25.0	0.1	0.1	0.2	0.2
<i>Juncus patens</i>	25.0	0.1	0.1	0.2	0.2
<i>Carex spp.</i>	25.0	0.1	0.1	0.2	0.2
<i>Cardamine oligosperma</i>	25.0	5.0	0.1	0.2	0.2
<i>unknown Asteraceae</i>	25.0	5.0	0.1	0.2	0.2
<i>Artemisia douglasiana</i>	25.0	5.0	0.1	0.2	0.2
<i>Polygonum spp.</i>	25.0	0.1	0.1	0.2	0.2

Typha (latifolia, angustifolia) Association

Common Name: Broadleaf or Narrowleaf Cattail Marsh Patches

Alliance: *Typha (angustifolia, domingensis, latifolia)* Herbaceous Alliance

Classification Comments

The association circumscription is the same as that of the alliance for the county. See above for detailed description.

References: Evens and Kentner 2006, Evens and San 2005, Evens et al. 2014, Hickson and Keeler-Wolf 2007, Keeler-Wolf and Vaghti 2000, Klein et al. 2007, Pickart 2006

Global Rarity Rank: GNR

State Rarity Rank: SNR

State Rare: N

Association Stand Table

*Taxon listed more than once, Con = Constancy, Rel = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often (see front matter for definitions).

Layer	Taxon	Con	Rel	Avg	Min	Max	Ch	D	cD	Oft
Tree	<i>Salix laevigata</i>	25.0	25.0	0.3	1	1				
Shrub	<i>Rubus ursinus</i>	50.0	23.9	0.3	0.2	1				Y
	<i>Toxicodendron diversilobum</i>	50.0	14.8	0.1	0.2	0.2				Y
	<i>Salix lasiolepis</i>	25.0	11.4	0.3	1	1				
Herb	<i>Typha angustifolia</i>	75.0	39.6	17.6	0.2	50			Y	Y
	<i>Schoenoplectus californicus</i>	50.0	10.9	6.3	10	15				Y
	<i>Typha latifolia</i>	25.0	18.2	10.0	40	40				
	<i>Polygonum lapathifolium</i>	25.0	10.5	3.8	15	15				
	<i>Urtica dioica</i>	25.0	5.0	0.1	0.2	0.2				
	<i>Artemisia douglasiana</i>	25.0	5.0	0.1	0.2	0.2				
	unknown Asteraceae	25.0	5.0	0.1	0.2	0.2				
	<i>Cardamine oligosperma</i>	25.0	5.0	0.1	0.2	0.2				
	<i>Juncus patens</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Polygonum spp.</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Carex spp.</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Potentilla anserina</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Polygonum punctatum</i>	25.0	0.1	0.1	0.2	0.2				
	<i>Scirpus microcarpus</i>	25.0	0.1	0.1	0.2	0.2				

Typha (angustifolia, domingensis, latifolia) Herbaceous Alliance

Rumex crispus 25.0 0.1 0.1 0.2 0.2
