

Hidden Treasure in California's Golden Hills

Mapping Sensitive Natural Communities in Grassland Habitat

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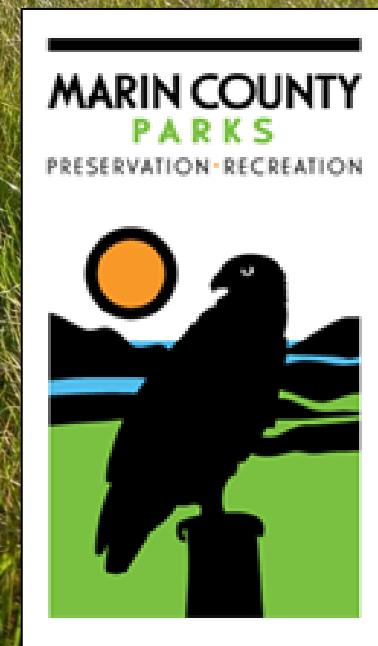


Festuca idahoensis
Ultramafic Association

Grassland mapping projects funded by:



THE WILDLANDS
— CONSERVANCY —



Nassella pulchra Association

A scenic view of a grassland landscape. In the foreground, tall grasses and small purple flowers sway in the wind. The middle ground shows rolling green hills. In the background, a range of mountains is visible under a blue sky with scattered white clouds.

Overview

- Challenges in mapping grasslands
- Threats
- Why and how I map grasslands
- Mapping results

Danthonia californica Association

The Golden Hills of California

- Spectacular
- Species rich
- Diverse herbaceous natural communities

Lasthenia californica-Plantago erecta-Vulpia microstachys Alliance



Threats to Grasslands

- Urbanization
- Agriculture
- Fire suppression
- Invasive species



HABITAT LOSS



Barbed goat grass

Challenges Mapping Grasslands

- Remote sensing is not effective
- Grasslands are under sampled
- Types not defined



Challenges Mapping Grasslands

- Remote sensing is not effective
- Grasslands are under sampled
- Types not defined
- Temporal variability
 - Early-late season
 - Year-year



Lasthenia californica-Plantago erecta-Vulpia microstachys Alliance

Why Map Grasslands?

- Resource management
- Conservation
- Planning



Festuca idahoensis Association

Classification System

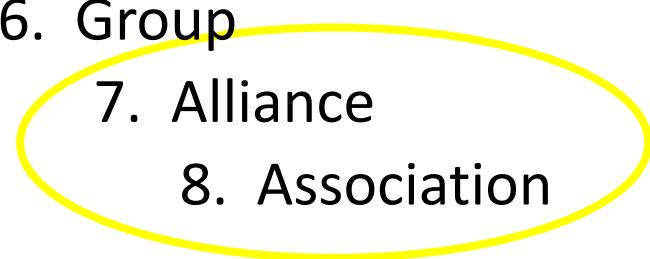
- US National Vegetation Classification System
- Manual of CA Vegetation

Broad-scale



Fine-scale

1. Formation Class
2. Formation Subclass
3. Formation
4. Division
5. Macrogroup
6. Group
7. Alliance
8. Association



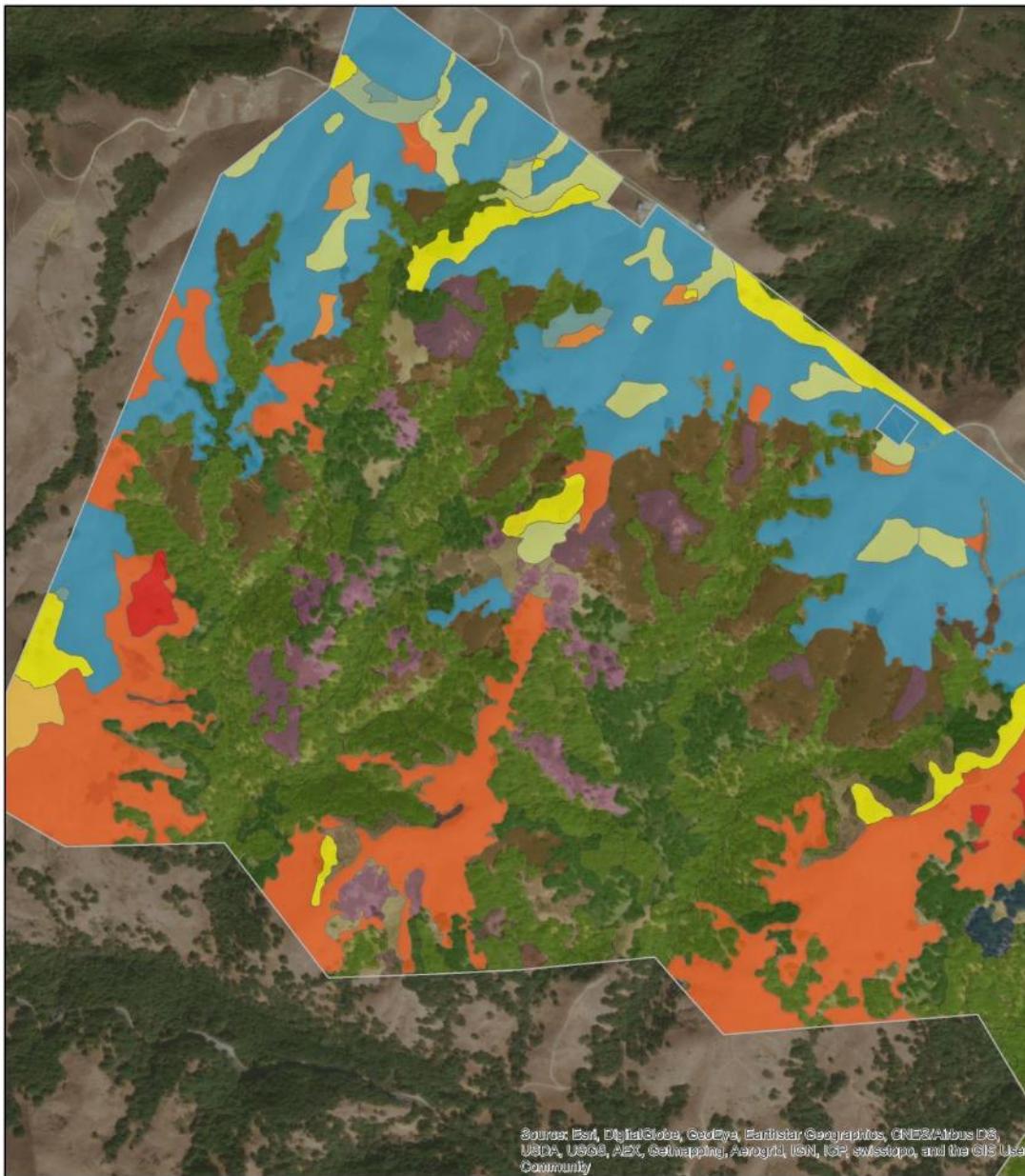
Mapping Techniques

Remote:

- Aerial imagery (high res., multi-spectral)
- Lidar (height, canopy structure)
- Field veg. surveys

Ground-based:

- Reconnaissance
- Field veg. survey
- Field mapping



Lucas Valley Preserve
Marin County Open Space District (MCOSD)

MCOSD Fine-Scale Grassland Map and
Marin County-Wide Fine Scale Vegetation Map, 2021



Fine-Scale Grassland Mapping Projects 2015-2021

Map Applications:

- Grazing management
- Rare species habitat
- Project planning



Tiburon mariposa lily



Tiburon jewel flower



How much native grassland habitat is left?



Historic wheat farming

{ Pleasanton Ridge

PROPORTION OF GRASSLAND OCCUPIED BY NATIVE COMMUNITIES

Park	Grassland Area (ac)	Native	Non-native
Ring Mountain	288	67%	33%
Jenner Headlands	150	62%	38%
Lucas Valley	501	59%	41%
Mt Burdell	1,016	47%	53%
Old St. Hilary's	92	47%	53%
Pleasanton Ridge	1,159	11%	89%

Rarity & Diversity of Grassland Communities

NUMBER OF GRASSLAND COMMUNITIES BY RARITY RANK

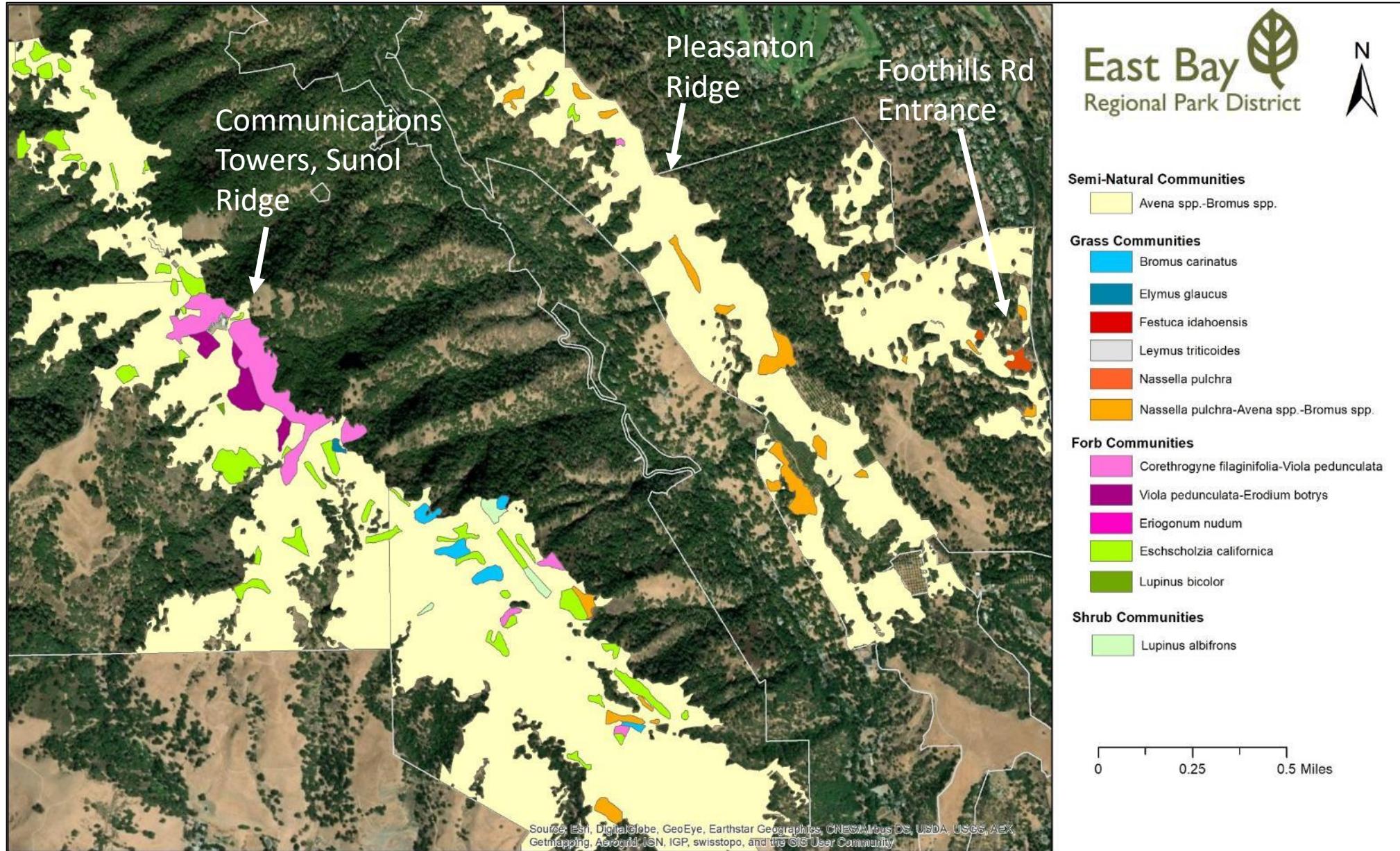
Rarity Rank	Ring Mtn.	Pleasanton Ridge	Mt Burdell	Old St. Hilary's	Lucas Valley	Jenner Headlands
Sensitive (S1-3)	12	9	7	8	7	4
S4, S5, SNR	3	4	5	2	2	3
Total	15	13	12	10	9	7

SNR (State Not Ranked) = Semi-Natural Stands, these stands are dominated by non-native species and are not ranked for rarity

		Acres					
		JH	LV	MB	OSH	RM	PR
Sensitive Natural Communities (S1-S3): GRASS TYPES							
Bromus carinatus-Elymus glaucus Alliance							
Bromus carinatus Association		4					6
Elymus glaucus Association		2		1		1	1
Pteridium aquilinum-Grass Association		5				<1	
Deschampsia cespitosa - Hordeum brachyantherum - Danthonia californica Alliance							
Deschampsia cespitosa Association		39				<1	
Hordeum brachyantherum Lowland Association						<1	
Festuca idahoensis-Danthonia californica Alliance							
Festuca idahoensis Ultramafic Association		13				1	1
Festuca idahoensis-Nassella pulchra Association			32		1		1
Festuca rubra Association					1		
Danthonia californica Association					1	3	
Leymus cinereus-Leymus triticoides Alliance							
Leymus triticoides Association					<1	<1	<1
Nassella spp.-Melica spp. Alliance							
Melica californica Association		4					
Melica torreyana Serpentine Association					16	32	
Nassella pulchra Association		25			6		6
Nassella pulchra-Avena spp.-Bromus spp. Association		218	435				34
Nassella pulchra-Lolium perenne-Plantago erecta Serpentine Association				30	19	151	
Elymus multisetus- (Eschscholzia californica - Plantago erecta) Association		29			2		
Total		77	294	465	43	191	48

		Acres					
		JH	LV	MB	OSH	RM	PR
Sensitive Natural Communities (S1-S3)							
FORB							
Corethrogynne filaginifolia-Eriogonum (elongatum, nudum) Alliance							
Eriogonum nudum Association							2
Eschscholzia (californica)-Lupinus (nanus) Alliance							
Eschscholzia californica Association							39
Lupinus bicolor Association							<1
Lasthenia californica-Plantago erecta-Vulpia microstachys Alliance							
Hemizonia congesta-Lolium perenne Association		15					
Vulpia microstachys-Plantago erecta-Calycadenia (truncata, multiglandulosa) Association							2
Trifolium variegatum Alliance							
GRASS-LIKE							
Carex (pansa, praegracilis) Alliance							
Carex praegracilis Association						<1	<1
Juncus (effusus, patens) Provisional Alliance							
Juncus effusus Association							1
Juncus phaeocephalus Association							6

Pleasanton Ridge Regional Park Grassland Map



MMU = 30m diam.

Non-native matrix

Diverse native communities, scattered

Native grass types: mesic microsites

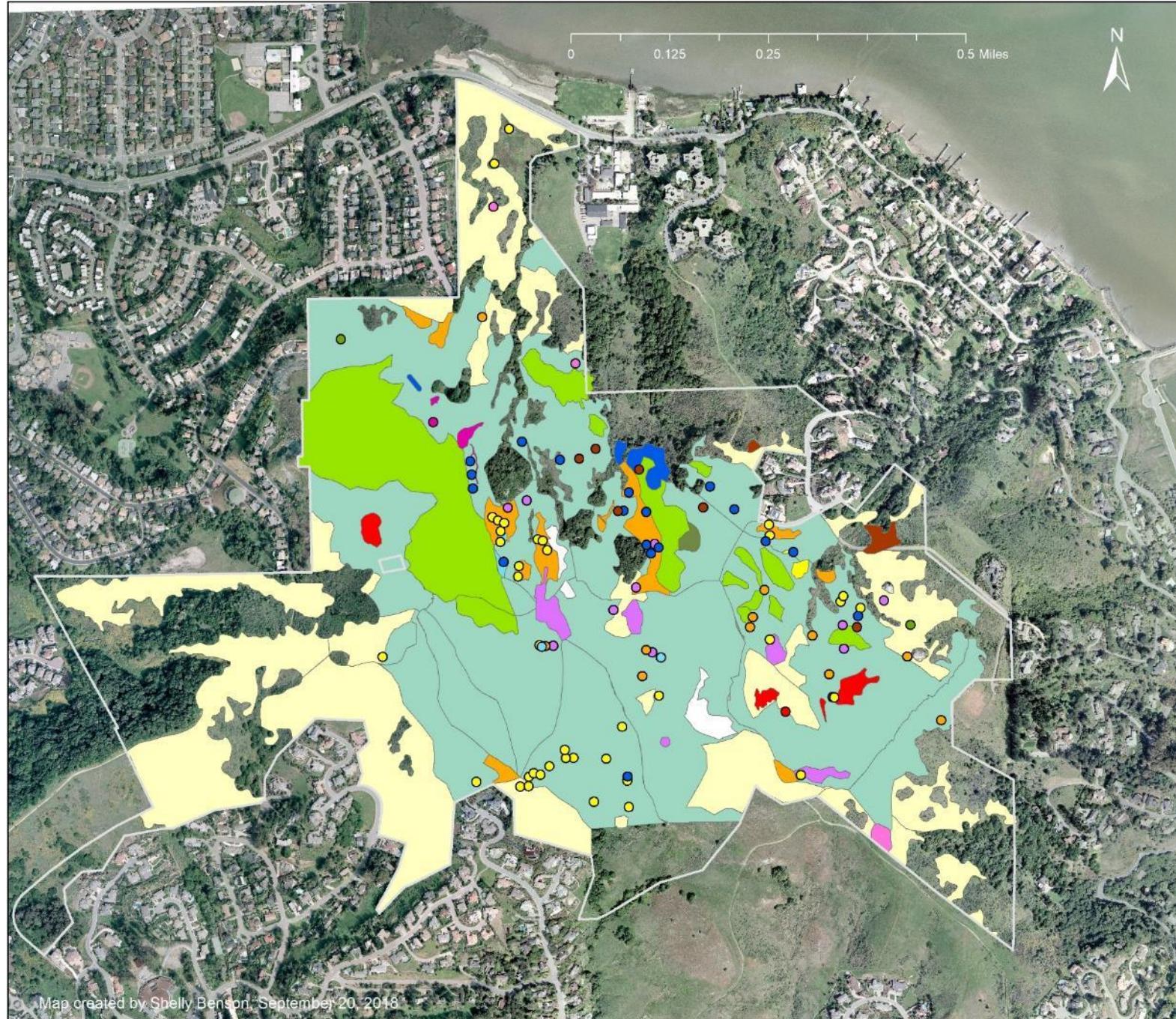
Native forb (wildflower) types: thin rocky soil

New type?!
Viola pedunculata

New Type?

Viola pedunculata
stand at Pleasanton
Ridge Regional Park





Ring Mountain Preserve Grassland Map

Legend

Vegetation Type

- Avena spp.-Bromus spp.
- Carex praegracilis
- Danthonia californica
- Deschampsia cespitosa
- Elymus (elymoides, multisetus)
- Elymus glaucus
- Festuca idahoensis
- Hordeum brachyantherum
- Leymus triticoides
- Lolium perenne
- Melica torreyana Serpentine
- Nassella pulchra-Lolium perenne-Plantago erecta Serpentine
- Pteridium aquilinum
- Vulpia microstachys-Plantago erecta-Calyadenia (truncata, multiglandulosa)

Park Boundary

RING MOUNTAIN



Takeaways

- Generic grasslands hold hidden treasures—SNC
- Fine-scale maps needed to protect grassland SNC
- Ground-based mapping is required
- Discoveries abound in this overlooked and under sampled habitat!

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Viola pedunculata at Estero Americano