

Mapping Standard and Land Use Categories for the Central Valley Riparian Mapping Project

**Developed for the Central Valley Flood Protection Program (CVFPP) Systemwide
Planning Area (SPA), major rivers and tributaries**

Prepared for:
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I. Minimum mapping resolution:

Data was heads-up digitized at a scale of 1:2,000 using National Agricultural Inventory Program 2009 aerial imagery (USDA 2009)

II. Minimum mapping unit:

Natural and semi-natural vegetation

The minimum mapping unit (MMU) for natural vegetation is 1-acre with average width ≥ 10 -meters for polygons mapped to the National Vegetation Classification System (NVCS) Group Level, provisional NVCS groups as presented by Sawyer et. al. (2009) and temporary provisional groups presented by Todd Keeler-Wolf (pers. comm.).

Provisional categories for Delta Land Use mapping data (Hickson and Wolf, 2006) aggregated to the CVRMP mapping data were categorized generically as "Macrogroup", "Division" and "Formation" (D. Hickson, pers. comm.).

Allowances for MMU rules were allowed for important or obvious types, such as in-stream islands or gravel bars.

Forested vegetation ($\geq 5\%$ tree cover) was also mapped (i.e. divided) to MMUs of 1-acre with average width ≥ 10 -meters based on categorical tree height (see "**Additional mapping rules**", below).

Shrub vegetation types ($< 5\%$ tree cover and $\geq 10\%$ shrub cover) were separated by estimated % cover when shrub-type vegetation polygons were ≥ 5 -acres

Agriculture and Urban areas

MMU for Agricultural and Urban areas classified at Anderson Level I was 10-acres with an average 10-meter minimum width.

Roads less than the MMU were included in other types or split between polygons that abut the road.

III. Additional mapping rules:

Vegetation over Water

Canopy of vegetation over water was digitized following canopy line (as opposed to estimating water to estimated bankline under canopy)

Height

Coded values for tree heights on forested land cover (i.e. less than 5% absolute tree cover) were based on aerial photo interpretation

Coded values for tree heights were provided as follows:

- 4** = 2-5 meters (6.5-16.4 feet)
- 5** = >5-10 meters (>16.4 – 32.8 feet)
- 6** = > 10-15 meters (>32.8 – 49.2 feet)
- 7** = >15 meters (>49.2 feet)

% Tree cover

Estimated absolute % cover ("0.2" if cover < 1%, but >0%)

% Shrub cover

Shrub cover was estimated when tree cover was < 40%.

Estimated absolute % cover ("0.2" if cover < 1%, but >0%)

% Herb cover

Herb cover was estimated when total tree and shrub cover was < 40%.

Coded values for herb cover were provided as follows:

1 = <2%

2 = 2-9%

3 = 10-39%

4 = 40-59%

5 = >60%

Isolated Trees

"Y" (Yes) indicates presence of isolated trees (i.e. if percent tree <5%)

Restoration Sites

"Y" (Yes) indicates feature is mapped habitat restoration vegetation

Comments

General comments regarding feature generated by feature author

IV. Vegetation Classification - Riparian (Vegetation) Group codes, names and characteristic vegetation types (from Sawyer et. al. 2009):

RWF - Riparian Evergreen and Deciduous Woodland includes:

Acer negundo alliance
Juglans hindsii special and semi-natural stands
Platanus racemosa alliance
Populus fremontii alliance
Quercus lobata “riparian” alliance
Salix gooddingii alliance
Salix laevigata alliance

IMF - Introduced North American Mediterranean forest (no group subdivision below this), includes stands of *Eucalyptus*, *Ailanthus*, and other non-native naturalized trees

WVO - Californian broadleaf forest and woodland includes:

Aesculus californica Alliance
Quercus agrifolia Alliance
Quercus douglasii Alliance
Quercus wislizeni Alliance
Quercus lobata Upland Alliance
Umbellularia californica Alliance

CSS - Central and south coastal California seral scrub includes:

Baccharis pilularis Alliance
Lotus scoparius Alliance
Lupinus albifrons Alliance
Heterotheca oregana sub-shrub scrub (putative definition)

RWS - Southwestern North America riparian wash/scrub includes:

Baccharis salicifolia Alliance
Cephalanthus occidentalis Alliance
Rosa californica Alliance
Salix exigua Alliance
Salix lasiolepis Alliance
Sambucus nigra Alliance

RIS - Riparian introduced scrub includes:

Arundo donax Semi-natural Stands
Tamarix spp. Semi-natural Stands
Rubus armenicus semi-natural stands

CAI - California Introduced Annual and Perennial Herbaceous includes:

Aegilops triuncialis Semi-natural Stands
Avena (barbata, fatua) Semi-natural Stands
Brassica (nigra) and other mustards Semi-natural Stands
Bromus (diandrus, hordeaceus)–*Brachypodium distachyon* Semi-natural Stands
Centaurea (solstitialis, melitensis) Semi-natural Stands
Centaurea (virgata) Semi-natural Stands

Conium maculatum–*Foeniculum vulgare* Semi-natural Stands
Cortaderia (jubata, selloana) Semi-natural Stands
Cynosurus echinatus Semi-natural Stands
Lolium perenne Semi-natural Stands

CFG - California annual forb/grass vegetation includes:

Ambrosia psilostachya Provisional Alliance
Amsinckia (menziesii, tessellata) Alliance
Artemisia douglasiana {Putative, not in MCV}
Artemisia dracunculus Alliance
Eschscholzia (californica) Alliance
Lasthenia californica–*Plantago erecta*–*Vulpia microstachys* Alliance
Lotus purshianus Provisional Alliance
Plagiobothrys nothofulvus Alliance

FEM - Freshwater emergent marsh includes:

Phragmites australis Alliance (most are considered invasive weedy ecotypes)
Schoenoplectus acutus Alliance
Schoenoplectus californicus Alliance
Typha (angustifolia, domingensis, latifolia) Alliance

WTM - Californian warm temperate marsh/seep includes:

Carex barbarae Alliance
Carex densa Provisional Alliance
Carex nudata Alliance
Juncus arcticus (var. *balticus, mexicana*) Alliance
Juncus (oxymetris, xiphioides) Provisional Alliance
Leymus triticoides Alliance
Mimulus (guttatus) Alliance

NRW - Naturalized warm-temperate riparian/wetland includes:

Lepidium latifolium Semi-natural Stands
Persicaria lapathifolia–*Xanthium strumarium* Provisional Alliance

FAV - Floating aquatic vegetation (Provisional Macrogroup incorporating NVCS Group-level vegetation **Temperate Pacific freshwater aquatic bed, Naturalized temperate Pacific freshwater vegetation, and Temperate freshwater floating mat)** includes:

Ludwigia (hexapetala, peploides) Semi-natural Stands
Myriophyllum strictum
Cabomba carolinensis
Egeria
Azolla (filiculoides, mexicana) Provisional Alliance
Lemna (minor) and relatives Provisional Alliance
Note: may also include *Eichornea crassipes* stands, if discovered in mapping area

VPB - Vernal pool basin includes:

Vernal Pools

VRF - Vancouverian riparian deciduous forest includes:

Alnus rhombifolia / *Cornus sericea*
Alnus rhombifolia / *Salix exigua* (*Rosa californica*)
White Alder (*Alnus rhombifolia*)
White Alder (*Alnus rhombifolia*) - Arroyo willow (*Salix lasiolepis*) restoration

¹WDT - Western dogwood thicket includes:

California Dogwood (*Cornus sericea*)

Cornus sericea - *Salix exigua*
Cornus sericea - *Salix lasiolepis* / (*Phragmites australis*)
Baccharis pilularis / Annual Grasses & Herbs
Buttonbush (*Cephalanthus occidentalis*)
California Wild Rose (*Rosa californica*)
Mexican Elderberry (*Sambucus mexicana*)
Narrow-leaf Willow (*Salix exigua*)
Salix exigua - (*Salix lasiolepis* - *Rubus discolor* - *Rosa californica*)
Salix lasiolepis - (*Cornus sericea*) / *Scirpus* spp.- (*Phragmites australis* - *Typha* spp.) complex unit
Salix lasiolepis - Mixed brambles (*Rosa californica* - *Vitis californica* - *Rubus discolor*)

SSB - Southwestern North American salt basin and high marsh includes:

Alkali Heath (*Frankenia salina*)
Alkaline vegetation mapping unit
Allenrolfea occidentalis mapping unit
Frankenia salina - *Distichlis spicata*
Pickleweed (*Salicornia virginica*)
Salt scalds and associated sparse vegetation
Suaeda moquinii - (*Lasthenia californica*) mapping unit

¹TBM - Temperate Pacific tidal salt and brackish meadow includes:

California Hair-grass (*Deschampsia caespitosa*)
Deschampsia caespitosa - *Lilaeopsis masonii*
Distichlis spicata - Annual Grasses
Distichlis spicata - *Juncus balticus*
Distichlis spicata - *Salicornia virginica*
Salicornia virginica - *Cotula coronopifolia*
Salicornia virginica - *Distichlis spicata*
Saltgrass (*Distichlis spicata*)

¹Macrogroup, Division and Formation:

Provisional categories for Delta Land Use mapping data (Hickson and Wolf, 2006) aggregated to the CVRMP mapping data categorized generically as “Macrogroup”, “Division” and “Formation” (D. Hickson, pers. comm..).

Agricultural – Evidence of current or recent agricultural activity

Urban - Ground covered by urban landscapes such as houses, other buildings, roads, etc

Bare Gravel Sand - Ground covered by cobble, gravels, sand or fines

Water - Standing water covers the mapping area with vegetation absent or very sparse

¹ *Vegetation alliances found only in Delta vegetation mapping data*

V. Medium-scale map checks and field validation:

Data was evaluated by personnel from the California Department of Fish and Game's Vegetation Mapping Program to verify a minimum mapping accuracy of 80% for CVRMP linework and categorical vegetation "group" type.

VI. References

Hickson, D. and T. Keeler-Wolf, Vegetation Classification and Mapping Program, California Department of Fish. 2006. 2006. Vegetation and Land Use Classification and Map of the Sacramento-San Joaquin River Delta.

Sawyer, J.O., T. Keeler-Wolf and J.M. Evens. 2009. A Manual of California Vegetation, 2nd edition. California Native Plant Society Press, Sacramento, CA.

USDA. 2009. 2009 National Agricultural Imagery Program Aerial Photography (California). USDA FSA Aerial Photography Field Office, Salt Lake City, Utah