

## X.0 FRESHWATER MARSH

### X.1 OVERVIEW OF THE FRESHWATER MARSH VEGETATION COMMUNITY

Freshwater marshes occur worldwide in low areas of the landscape where water collects or where a relatively impermeable soil or geologic layer causes water to pond (Crandell 2017). Freshwater marshes, including the littoral zone of lakes, are unique transitional habitats that occur at the interface between the terrestrial and aquatic environments (Gulis, Kuehn, and Suberkroop 2009). Emergent plants, such as cattails (*Typha*) or common reed (*Phragmites*), are common inhabitants of freshwater marshes. These plants often have very high rates of primary production, making freshwater marshes among the most productive ecosystems on the planet.

In California, freshwater marshes are found throughout the state, occurring in many different climates and elevations (Cheadle Center for Biodiversity & Ecological Restoration 2017). They typically occur in nutrient-rich mineral soils that drain slowly and are waterlogged or saturated for most or all of the year. Freshwater marshes occur in drainages, seepages, and other perennially moist, low places often found along stream courses and near riparian wetland areas (County of San Diego Dept. of Planning and Land Use, n.d.). Some freshwater marshes are vernal, filling with winter and spring rains and drying out in the summer (Cheadle Center for Biodiversity & Ecological Restoration 2017). They often have open water in depressions or natural springs (County of San Diego Dept. of Planning and Land Use, n.d.). In San Diego, freshwater marshes are found in small isolated areas along the major stream courses, such as the San Diego, San Dieguito, San Luis Rey, and Santa Margarita Rivers, as well as the upper ends of the major lagoons (County of San Diego Dept. of Planning and Land Use, n.d.). Freshwater marsh is the ninth largest vegetation community in the MSPA. There are 5,910 acres of freshwater marsh vegetation encompassing all MUs, 2,973 acres (50%) of which are conserved (Table V. 2C.X-1 and Figure V2C.X-1, or view an online map at: [https://portal.sdmmp.com/map\\_vegetation.php?taxaid=SDMMP\\_vegcom\\_5](https://portal.sdmmp.com/map_vegetation.php?taxaid=SDMMP_vegcom_5)). A large area of freshwater marsh is present in MU9, in the basin containing Lake Henshaw. The least amount of freshwater marsh is found in MU2, with the least amount of freshwater marsh on Conserved Lands found in MU8.

The freshwater marsh vegetation community is home to a number of species of birds including the yellowthroat (*Geothlypis trichas*), several species of small herons (Ardeidae), and rails (Rallidae) (County of San Diego Dept. of Planning and Land Use, n.d.). Tricolored blackbird (*Agelaius tricolor*) colonies were historically located primarily in freshwater marshes dominated by cattails (*Typha*) or tules (*Schoenoplectus acutus*) (The Tricolored Blackbird Working Group 2007). However, due to the decline of freshwater marshes, tricolored blackbird colonies are now often found on silage fields. Undisturbed freshwater marsh has also served as habitat for native frog species, several of which are now endangered (County of San Diego Dept. of Planning and Land Use, n.d.). The southwestern pond turtle (*Emys marmorata pallida*) is another species found in freshwater marsh habitat, and is more likely to occur at natural sites with limited human access (Schuster, Fisher, and Madden 2009).

Freshwater marsh vegetation communities are characterized by the presence of emergent hydrophytes (plants adapted to growing in saturated soils and standing water) (Cheadle Center for Biodiversity & Ecological Restoration 2017). The dominant plants within freshwater marshes often include rushes (*Juncus* spp.), cattails (*Typha* spp.), bulrushes or tules (*Schoenoplectus* spp.), sedges (*Carex* spp.), grass species, and several species of small willows (*Salix* spp.) (County of San Diego Dept. of Planning and Land Use, n.d.). Many of these species are rhizomatous (spreading from underground horizontal stems) and can tolerate growing in low oxygen conditions characteristic of saturated soils.

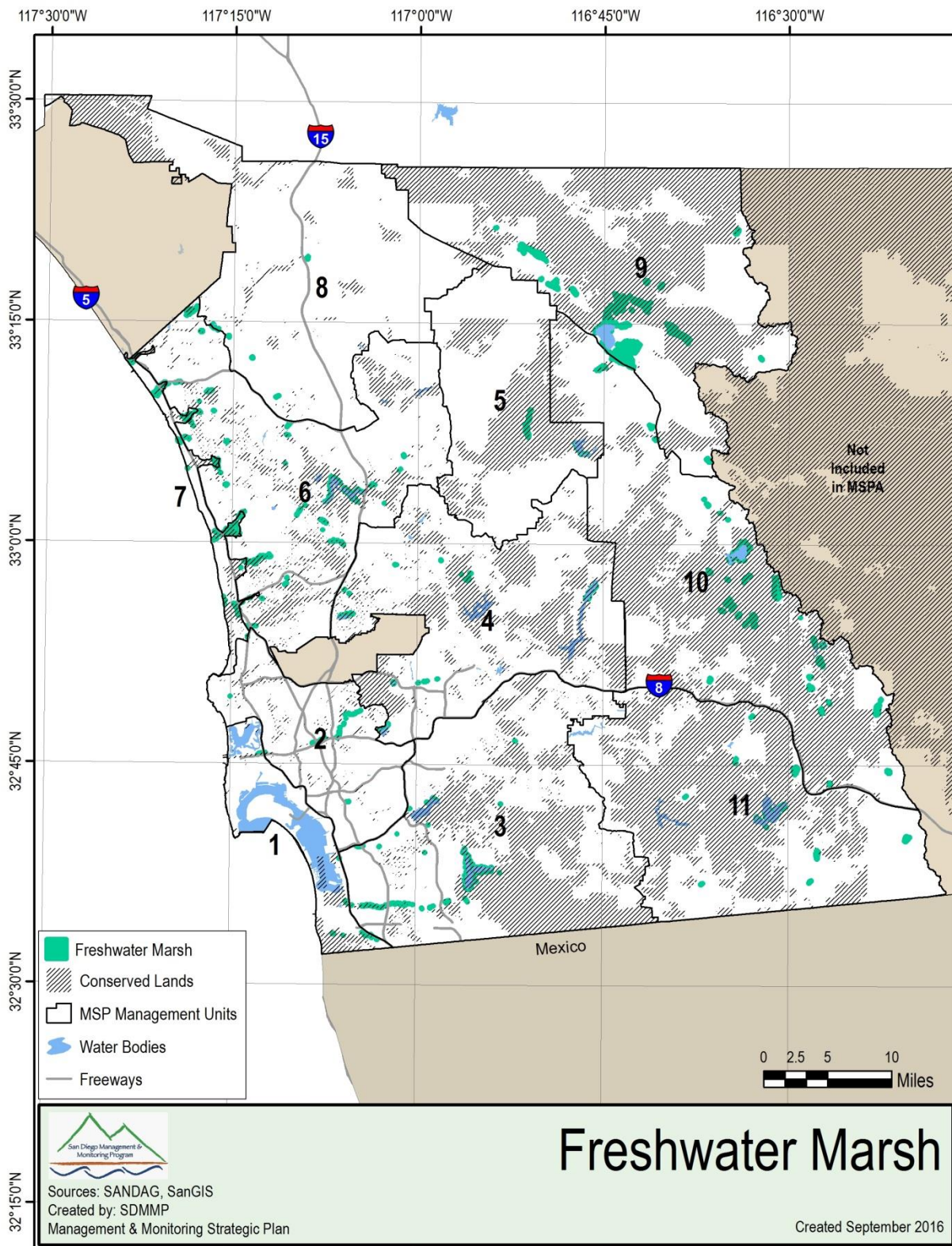
Characteristic species of freshwater marsh include: wooly sedge (*Carex pellita*), swamp sedge (*C. senta*), Chufa flatsedge (*Cyperus esculentus*), tall flatsedge (*C. eragrostis*), spikerush (*Eleocharis* spp.), whorled marsh pennywort (*Hydrocotyle verticillata triradiata*), mudwort (*Limosella aquatic*), common reed (*Phragmites australis*), hardstem bulrush (*Schoenoplectus acutus*), chairmaker's bulrush (*S. americanus*), California bulrush (*S. californicus*), sturdy bulrush (*Bolboschoenus robustus*), broadfruit bur reed (*Sparganium eurycarpum*), narrowleaf cattail (*Typha angustifolia* [nonnative]), southern cattail (*T. domingensis*), broadleaf cattail (*T. latifolia*), and purpletop vervain (*Verbena bonariensis* [nonnative]) (Oberbauer, Kelly, and Buegge 2008).

There are three freshwater marsh alliances mapped by AECOM in western San Diego County; the *Schoenoplectus acutus* Alliance, the *Schoenoplectus americanus* Alliance, and the *Typha* (*angustifolia*, *domingensis*, *latifolia*) Alliance (Sproul et al. 2011). The *Schoenoplectus acutus* Alliance is widespread and found throughout much of North America. The vegetation alliance exists in freshwater to slightly brackish water and is not commonly found on the edges of large stretches of open water. Vegetative cover is intermittent to continuous in this alliance, with *Schoenoplectus acutus* as the dominant or codominant plant in the herbaceous layer. The *Schoenoplectus americanus* Alliance occurs in many wetlands throughout the western United States and the southern Great Plains. In California, most stands are associated with inland wetlands adjacent to alkali playas and seeps, but they also occur in coastal brackish marshes. Vegetative cover is intermittent to continuous in this alliance, with *Schoenoplectus americanus* as the dominant or codominant plant in the herbaceous layer. The *Schoenoplectus americanus* Alliance tends to tolerate higher alkalinity or salinity than the *Schoenoplectus acutus* Alliance. The *Typha* (*angustifolia*, *domingensis*, *latifolia*) Alliance includes all three cattail species as they have similar ecologies and often hybridize in mixed stands. Vegetative cover is intermittent to continuous in this alliance, with *Typha angustifolia*, *T. domingensis*, or *T. latifolia* as dominant or codominant in the herbaceous layer. In coastal Southern California, stands tend to have *T. domingensis* as the most common dominant species.

**Table V2C.X-1. Total acres of freshwater marsh on Conserved Lands by MSP Management Units.**

MU	Total Acres	Acres on Conserved Lands
1	32	25

2	28	7
3	231	203
4	110	103
5	126	126
6	424	356
7	463	388
8	45	4
9	3,036	980
10	980	553
11	435	229
<b>Grand Total</b>	<b>5,910</b>	<b>2,973</b>



**Figure V2C.X-1. Distribution of freshwater marsh vegetation in the MSPA.**

## X.2 MSP SPECIES USING FRESHWATER MARSH VEGETATION

Eight MSP species are associated with freshwater marsh, including one plant, one reptile, and six bird species. The eight SL, SO, and VG species will benefit incidentally from freshwater marsh vegetation management. In particular, the Southwestern pond turtle will benefit from invasive aquatic animal and plant removal, and the tricolored blackbird will benefit from restoring the El Monte ponds. There are no VF species associated with freshwater marsh.

Scientific Name	Common Name	Management Category	Summary Page Link
<b>Plants</b>			
<i>Iva hayesiana</i>	San Diego marsh-elder	VG	<a href="https://portal.sdmmp.com/view_species.php?taxaid=36037">https://portal.sdmmp.com/view_species.php?taxaid=36037</a>
<b>Reptiles</b>			
<i>Emys marmorata pallida</i>	Southwestern pond turtle	SL	<a href="https://portal.sdmmp.com/view_species.php?taxaid=668677">https://portal.sdmmp.com/view_species.php?taxaid=668677</a>
<b>Birds</b>			
<i>Agelaius tricolor</i>	Tricolored blackbird	SL	<a href="https://portal.sdmmp.com/view_species.php?taxaid=179060">https://portal.sdmmp.com/view_species.php?taxaid=179060</a>
<i>Branta canadensis</i>	Canada goose	VG	<a href="https://portal.sdmmp.com/view_species.php?taxaid=174999">https://portal.sdmmp.com/view_species.php?taxaid=174999</a>
<i>Circus cyaneus</i>	Northern harrier	SO	<a href="https://portal.sdmmp.com/view_species.php?taxaid=175430">https://portal.sdmmp.com/view_species.php?taxaid=175430</a>
<i>Haliaeetus leucocephalus</i>	Bald eagle	VG	<a href="https://portal.sdmmp.com/view_species.php?taxaid=175420">https://portal.sdmmp.com/view_species.php?taxaid=175420</a>
<i>Pandion haliaetus</i>	Osprey	VG	<a href="https://portal.sdmmp.com/view_species.php?taxaid=175590">https://portal.sdmmp.com/view_species.php?taxaid=175590</a>
<i>Plegadis chihi</i>	White-faced ibis	VG	<a href="https://portal.sdmmp.com/view_species.php?taxaid=174926">https://portal.sdmmp.com/view_species.php?taxaid=174926</a>

**Table V2C.X-2. Freshwater marsh and associated MSP species.**



### **X.3 THREATS TO FRESHWATER MARSH VEGETATION**

Freshwater marshes can reduce destructive flooding, decrease waterborne pollution, and support many species of resident and migratory animals (Cheadle Center for Biodiversity & Ecological Restoration 2017). Despite these benefits, more than 90% of freshwater marshes in California have been destroyed due to filling with soil, draining, overgrazing, or conversion to nonnative species. Channelization and clearing of vegetation within stream channels have also negatively affected freshwater marsh communities (County of San Diego Dept. of Planning and Land Use, n.d.).

Additional factors contributing to the loss and degradation of freshwater marsh include diversions and damming of river flows, disconnecting floodplain wetlands from flood flows, eutrophication, contamination, harvests of plants and animals, climate change, and invasions by invasive exotics (Brinson and Malvarez 2002).

Numerous water bodies in the San Diego region are known to be degraded due to several different stressors from various sources such as agricultural, urban, and other anthropogenic sources (San Diego Regional Water Quality Control Board 2013). Many of the region's surface waters are included on the Clean Water Act Section 303 (d) list of waters where water quality objectives are not met.

### **X.4 MANAGEMENT AND MONITORING APPROACH**

This section provides the rationale for management and monitoring objectives for freshwater marsh vegetation and associated MSP species. The management and monitoring approach is based on an adaptive management framework intended to refine and improve the effectiveness of the management strategy over time.

#### **X.4.1 General Approach Objectives**

There are no objectives for freshwater marsh in the MSP Roadmap 2017-2021 planning cycle. For the most up-to-date goals, objectives, and actions, go to the MSP Portal:

[https://portal.sdmmp.com/tracker.php?Target=veg+community&Species=SDMMP\\_vegcom\\_5&MonMgtObjType=&ActionStatus=&ManagementUnit=&ObjectiveType=&Year=&Preserve=&Short=Long&submit=Submit](https://portal.sdmmp.com/tracker.php?Target=veg+community&Species=SDMMP_vegcom_5&MonMgtObjType=&ActionStatus=&ManagementUnit=&ObjectiveType=&Year=&Preserve=&Short=Long&submit=Submit) .

#### **X.4.2 Species-Specific Approach Objectives**

There are not any freshwater marsh VF species in the MSPA that have specific vegetation characteristics that need to be managed for persistence in the MSPA. However, there are management actions for SL and SO species that may incidentally benefit freshwater marsh vegetation. The planned management actions for the northern harrier (*Circus cyaneus*) in 2017-2021 may incidentally benefit freshwater marsh vegetation. Those actions include protecting nesting occurrences from disturbance through fencing, signage, and enforcement, as well as enhancing the habitat. Similarly, management actions for the tricolored blackbird would benefit freshwater marsh vegetation. Habitat restoration efforts for the El Monte ponds are an example of this. Routine management activities will also benefit freshwater marsh vegetation though

protecting tricolored blackbird occurrences from disturbance through fencing, signage, and enforcement and adding additional water to ponded sites. Translocation efforts for the southwestern pond turtle could also incidentally benefit freshwater marsh vegetation. The translocation efforts may include management of invasive aquatic and plant species and providing access protection which will incidentally benefit freshwater marsh vegetation.

## **X.5 FRESHWATER MARSH REFERENCES**

Brinson, M., and A. Malvarez. 2002. "Temperate Freshwater Wetlands: Types, Status, and Threats." *Environmental Conservation* 29 (2): 115–33. doi:10.1017/S0376892902000085.

Cheadle Center for Biodiversity & Ecological Restoration. 2017. "Freshwater Marsh." Accessed November 14. <https://www.ccber.ucsb.edu/ecosystem/habitats-wetland/freshwater-marsh>.

County of San Diego Dept. of Planning and Land Use. n.d. "Marsh Vegetation Community." San Diego, CA.

Crandell, Caren J. 2017. "Wetlands." *Encyclopedia Britannica*.  
<https://www.britannica.com/science/wetland>.

Gulis, V., K.A. Kuehn, and K. Suberkroop. 2009. "Fungi." In *Encyclopedia of Inland Waters*, 233–43. Academic Press, 2009.

Oberbauer, T. A., M. Kelly, and Jeremy Buegge. 2008. *Draft Vegetation Communities of San Diego County. Based on "Preliminary Descriptions of the Terrestrial Natural Communities of California", Robert F. Holland, Ph.D., October 1986*. San Diego, CA.

San Diego Regional Water Quality Control Board. 2013. "SWAMP Factsheet Region 9." San Diego, CA.  
[https://www.waterboards.ca.gov/sandiego/water\\_issues/programs/swamp/docs/regional/SWAMP\\_Fact\\_Sheet\\_R9\\_11\\_25\\_2013.pdf](https://www.waterboards.ca.gov/sandiego/water_issues/programs/swamp/docs/regional/SWAMP_Fact_Sheet_R9_11_25_2013.pdf).

Schuster, S. L., R. N. Fisher, and M.C. Madden. 2009. "Impacts of Habitat Loss, Fragmentation, and the Introduction of Non-Native Species as a Result of Urbanization on the Western Pond Turtle in Southern California." In *Ecology of Wildlife in Urban Areas*.

Sproul, F., T. Keeler-Wolf, P. Gordon-Reedy, J. Dunn, A. Klein, and K. Harper. 2011. *Vegetation Classification Manual for Western San Diego County*. First. San Diego, CA.

The Tricolored Blackbird Working Group. 2007. "Conservation Plan for the Tricolored Blackbird (*Agelaius Tricolor* )."