11630

Pacific Coastal Marsh Systems

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Herbaceous Wetland

Map Zones

3, 4, 5

Geographic Range

This Biophysical Setting (BpS) occurs along the northern California Pacific coast. It includes coastal salt marsh, coastal freshwater and brackish marshes, and mudflats. Freshwater mudflats are found scattered throughout the temperate regions of the Pacific coast of North America. Along the Pacific, they occur primarily in seasonally flooded shallow lakebeds on floodplains. Coastal salt marshes are scattered along the coast, limited to bays and behind sand spits or other locations protected from wave action.

Biophysical Site Description

Herbaceous wetland occurs on flat, poorly drained sites or on valley bottom depressions. Mudflat vegetation develops where the bottom has been exposed long enough for establishment of a seedbank. Typically, salt marshes form with a mixture of inputs from freshwater sources into coastal saltwater, so they commonly co-occur with brackish marshes. These systems are exposed to continuously changing levels of salinity through submergence in ocean waters. Summer dry periods result in decreased freshwater inputs from inland. Hypersaline environments within salt marshes occur in “salt pans,” where tidal water collects and evaporates.

Vegetation Description

Mudflats must be exposed before the vegetation develops from the seedbank. They are dominated mainly by low-stature annual plants. They range in physiognomy from sparsely vegetated mud to extensive sods of herbaceous vegetation. The predominant species include *Eleocharis obtusa*, *Lilaeopsis occidentalis*, *Crassula aquatica*, *Limosella aquatica*, *Gnaphalium palustre*, *Eragrostis hypnoides*, and *Ludwigia palustris*.

Characteristic plant species include *Distichlis spicata*, *Monanthochloe littoralis*, *Limonium californicum*, *Jaumea carnosa*, *Salicornia* spp., *Suaeda* spp., *Batis maritima*, and *Triglochin* spp. Rare plant species include *Cordylanthus maritimus* ssp. *maritimus*. Salt marshes are very productive environments and are important for migratory birds.

Large (>0.5km2) coastal and valley freshwater marsh and wet meadow communities are dominated by *Scirpus* (bulrush), *Typha* spp. (cattail), and/or other herbaceous species with saturated soil or standing water for most of the year, but generally dries out annually. Vegetation is characterized by short to medium graminoids that typically range from 0.5-1m. Some stands are heavily dominated by *Eleocharis*, *Scirpus*, and/or *Typha* spp. whereas others have several graminoids common throughout the stand. In the Klamath Mountains, stands may occur in saturated meadows and along the shores of ponds and lakes that experience draw-down throughout the growing season. Some stands occupy the centers of vernal pools (Sawyer & Wolf; Sugihara et al. 2005).

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| ELOB2 | *Eleocharis obtusa* | Blunt spikerush |
| LIOC | *Lilaeopsis occidentalis* | Western grasswort |
| CRAQ | *Crassula aquatica* | Water pygmyweed |
| LIAQ | *Limosella aquatica* | Water mudwort |
| GNPA | *Gnaphalium palustre* | Western marsh cudweed |
| ERHY | *Eragrostis hypnoides* | Teal lovegrass |
| LUPA | *Ludwigia palustris* | Marsh seedbox |

Species names are from the NRCS PLANTS database. Check species codes at http://plants.usda.gov.

Disturbance Description

The fire return interval (FRI) of herbaceous wetland is 3-20yrs. These sites were likely burned by native peoples, along with adjacent grasslands. In the absence of Native Americans, the FRI probably tended toward the longer end of this range. Native herbivory was also a source of continual background-level disturbance (FEIS). These systems will succeed to upland grasslands at very long time frames (tens of thousands of years) (Mayer & Laudenslayer 1988).

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 16 | 69 |  |  |
| Moderate (Mixed) | 35 | 31 |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 11 | 100 |  |  |

Fire interval is expressed in years for each fire severity class and for all types of fire combined (All Fires). Average FI is the central tendency modeled. Percent of all fires is the percent of all fires modeled in that severity class. Minimum and Maximum FIs show the relative range of fire intervals as estimated by model contributors, if known.

Scale Description

Historically, fire size probably varied widely from very small fires (10s of hectares) to very large fires (1000s of hectares). Fires in this system are tied to burning in adjacent uplands (Sugihara et al. 2005).

Adjacency or Identification Concerns

Adjacent systems include grasslands, coastal scrub, chaparral, oak woodland, and mountain meadows. Large portions of herbaceous wetland are now in an uncharacteristic state as they have been drained and/or converted to agriculture/grazing.

Issues or Problems

*Parapholis* spp. and *Lythrum salicaria* are notable invasive plant species associated with this system.

Native Uncharacteristic Conditions

Comments

Map zones (MZs) 3, 4, and 5 were combined during the 2015 BpS review.

This BpS was imported from R1WEHB and modified to fit LANDFIRE by Foster.

Succession Classes

**Mapping Rules**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Upper Layer Lifeform** | **Height (m)** | **Canopy Cover (%)** | | | | | | | | | |
| **0-10** | **11-20** | **21-30** | **31-40** | **41 - 50** | **51-60** | **61-70** | **71-80** | **81-90** | **91-100** |
| Herb | 0-0.5 | A | A | A | A | A | A | A | A | A | A |
| Herb | 0.5-1.0 | C | C | C | C | C | C | B | B | B | B |
| Herb | >1.0 | C | C | C | C | C | C | B | B | B | B |
| Shrub | 0-0.5 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Shrub | 0.5-1.0 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Shrub | 1.0-3.0 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Shrub | >3.0 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 0-5 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 5-10 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 10-25 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 25-50 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | >50 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |

Succession class letters A-E are described in the Succession Class Description section. Some classes use a leafform distinction where a qualifier is added to the class letter: Brdl (broadleaf), Con (conifer), or Mix (mixed conifer and broadleaf). UN refers to uncharacteristic native or a combination of height and cover that would not be expected under the reference condition. NP refers to not possible or a combination of height and cover which is not physiologically possible for the species in the BpS.

**Description**

Class A 7 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| SCCO | Scirpus congdonii | Congdon’s bulrush | Upper |
| LETR5 | Leymus triticoides | Beardless wildrye | Upper |
| TYPHA | Typha | Cattail | Upper |
| ELOB2 | Eleocharis obtusa | Blunt spikerush | Upper |

Description

Immediately after a stand-replacing fire, this class appears. It is composed of *Scirpus*, *Typha*, *Eleocharis*, and other wetland graminoids in an early life stage (1yr).

*Maximum Tree Size Class*  
None

Class B 90 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| SCCO | Scirpus congdonii | Congdon’s bulrush | Upper |
| LETR5 | Leymus triticoides | Beardless wildrye | Upper |
| ELOB2 | Eleocharis obtusa | Blunt spikerush | Upper |
| TYPHA | Typha | Cattail | Upper |

Description

This class is composed of closed-canopy wetland species including *Scirpus*, *Typha*, *Eleocharis*, and other wetland graminoids. This type occurs several years after a stand-replacing fire.

This class begins approximately 1yr post-replacement disturbance, and persists in the absence of disturbance. Replacement fire is rare.

*Maximum Tree Size Class*  
None

Class C 3 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| SCCO | Scirpus congdonii | Congdon’s bulrush | Upper |
| LETR5 | Leymus triticoides | Beardless wildrye | Upper |
| TYPHA | Typha | Cattail | Upper |
| ELOB2 | Eleocharis obtusa | Blunt spikerush | Upper |

Description

A matrix of openings and closed-canopy wetland species, including *Scirpus*, *Typha*, *Eleocharis*, and other wetland graminoids. This type can occur via two pathways. A mixed-severity fire creates a patchy expression of this type. Alternatively, a rare, extreme stand-replacing fire event (during a drought) would patchily kill rhizomes and, a few years later, creates a patchy expression of this type.

Class lasts for approximately 1yr. Replacement fire is less frequent than for the closed-canopy stands, but mixed fire is more frequent.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:CLS | 1 |
| Mid1:OPN | 2 | Mid1:CLS | 3 |
| Mid1:CLS | 2 | Mid1:CLS | 999 |

Probabilistic Transitions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Disturbance Type** | **Disturbance occurs In** | **Moves vegetation to** | **Disturbance Probability** | **Return Interval (yrs)** | **Reset Age to New Class Start Age After Disturbance?** | **Years Since Last Disturbance** |
| Alternative Succession | Early1:ALL | Mid1:OPN | 0.05 | 20 | Yes | 0 |
| Mixed Fire | Mid1:OPN | Mid1:OPN | 0.05 | 20 | No | 0 |
| Replacement Fire | Mid1:OPN | Early1:ALL | 0.05 | 20 | Yes | 0 |
| Mixed Fire | Mid1:CLS | Mid1:OPN | 0.03 | 33 | Yes | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.07 | 14 | Yes | 0 |

References

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