17220

Western North American Boreal Freshwater Emergent Marsh

BpS Model/Description Version: Nov. 202410/23/08 9/11/15

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| --- | --- | --- | --- |
| **Modelers** |  | **Reviewers** |  |
| Kori Blankenship | kblankenship@tnc.org | Jeff Williams | Jeff\_Williams@fws.gov |
| Keith Boggs | ankwb@uaa.alaska.edu | None | None |
| None | None | None | None |

Reviewer: Robin Innes

Vegetation Type

Herbaceous Wetland

Map Zones

68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78

Model Splits or Lumps

North American Boreal and Arctic Freshwater Aquatic Bed (BpS 1627) is lumped with this Biophysical Setting (BpS).

Geographic Range

This BpS occurs throughout the boreal region of North America. In Alaska it occurs across the interior boreal region and on the Alaska Peninsula, Aleutian Islands, and Kodiak Island.

Biophysical Site Description

This BpS occurs on the margins of ponds, lakes, and riparian systems, and on inland deltas where rivers drain into large lakes. Inland marshes are mostly small patch, confined to limited areas in suitable floodplain or basin topography. They are typically semi-permanently flooded, but some marshes have seasonal flooding. Water is at or above the surface for most of the growing season (typically 10 cm above the surface). Soils are muck or mineral, and water is nutrient-rich. Adjacent deeper water support aquatic beds.

Vegetation Description

These marshes are characterized by having >10% cover of emergent herbaceous vegetation. These systems are highly productive and have high rates of decomposition. Freshwater marsh vegetation is dominated by emergent vegetation such as *Carex aquatilis, Carex utriculata, Comarum palustre, Schoenoplectus tabernaemontani, Typha latifolia, Menyanthes trifoliata*, *Equisetum fluviatile, Equisetum palustre,* and *Hippuris* spp. *Arctophila fulva* becomes more common in the northern portions of boreal Alaska. Species of *Eriophorum* do not commonly occur in this system. Species diversity is often low. Adjacent aquatic beds would support submerged vegetation.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| CAAQ | *Carex aquatilis* | Water sedge |
| CAUT | *Carex utriculata* | Northwest territory sedge |
| METR3 | *Menyanthes trifoliata* | Buckbean |
| COPA28 | *Comarum palustre* | Purple marshlocks |
| HIPPU | *Hippuris spp.* | Mare's-tail |
| EQFL | *Equisetum fluviatile* | Water horsetail |

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

Disturbance Description

This system is highly productive and has high rates of decomposition (National Wetlands Working Group 1997). This system requires a source of freshwater. Seasonal flooding is characteristic of inland deltas. Marsh zonation is related to water depth and duration of flooding. A typical sequence progresses from open water to emergent deep marsh to shallow marsh to wet meadow or fen. Floating marsh mats may be seral to fens.

In 2015, an extensive literature search was done by Fire Effects Information System staff to locate information for a synthesis on fire regimes of Alaskan wet and mesic herbaceous systems (Innes 2015). At that time there was little published information on fire regimes of freshwater marshes in AK, but anecdotal information suggests that they can occasionally burn (Innes 2015).

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement |  |  |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| All Fires |  |  |  |  |

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

Generally small patch to large patch but could also be linear.

Adjacency or Identification Concerns

This system may be found adjacent to other wetlands on the edges of ponds and lakes.

Issues or Problems

Native Uncharacteristic Conditions

Aside from circumstances where natural hydrology has been substantially altered, this BpS is not generally found to be departed from its “Reference Condition.”

Comments

In 2021 NatureServe merged Aleutian Freshwater Marsh (BpS 1722) and Western North American Boreal Freshwater Emergent Marsh (BpS 1625) into one Ecological System: Western North American Boreal Freshwater Emergent Marsh. Kori Blankenship worked with NatureServe staff to update the BpS description to reflect the new Ecological System concept. BpS 1625 was previously lumped into another system so the state-and-transition model for BpS 1722 was chosen to represent the new BpS concept.

During LANDFIRE National the 1722 BpS model was created by Kori Blankenship and Keith Boggs based on information from the draft Aleutians Ecological Systems description.

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 | A | A | A | A | A | A | A | A | A | A |
| Herb | >1.0 | A | A | A | A | A | A | A | A | A | A |
| Shrub | 0-0.5 | A | A | UN | UN | UN | UN | UN | UN | UN | UN |
| Shrub | 0.5-1.0 | A | A | UN | UN | UN | UN | UN | UN | UN | UN |
| Shrub | 1.0-3.0 | A | A | UN | UN | UN | UN | UN | UN | UN | UN |
| Shrub | >3.0 | A | A | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 0-5 | A | A | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 5-10 | A | A | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 10-25 | A | A | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 25-50 | A | A | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | >50 | A | A | 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 100 Mid Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| CAAQ | *Carex aquatilis* | Water sedge | Upper |
| CAUT | *Carex utriculata* | Northwest territory sedge | Upper |
| METR3 | *Menyanthes trifoliata* | Buckbean | Upper |
| COPA28 | *Comarum palustre* | Purple marshlocks | Upper |

Description

This class represents the Freshwater Marsh system. *Hippuris* spp. and *Equisetum fluviatile* are also important indicator species.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Mid1:ALL | 0 | Mid1:ALL | 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** |

References

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