

Ecological Site Description ID:	R236XY129AK—Western Alaska Maritime Scrub Peat Plains, Coastal
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Ecological Dynamics of the Site:

This western Alaska maritime ecological site is located on lowland coastal plains in areas where water is on the surface. These areas are typically found at elevations between sea level and 120 feet with slopes of 0 to 3 percent. Slope aspect does not appear to influence the plant community dynamics of this site as it is found on all aspects.

This ecological site is correlated to D36-Western maritime sedge organic coastal plains and Sheepisland soils. Soil characteristics that are likely to influence plant community dynamics include a cryic soil temperature regime, an aquic moisture regime with moderate to rapid soil permeability to a depth of 40 inches and a neutral to strongly acidic (pH 7.2 to 5.1) surface layer. These soils are very poorly drained with negligible runoff potential. Organic material content is commonly 85 to 95 percent in the surface layer. Annual precipitation is commonly between 21 and 28 inches, and the annual frost-free period ranges from 85 to 140 days. Parent material consists of mossy organic material over loamy or silty marine deposits.

The reference community phase is typified by scrubland consisting of hydrophilic shrubs and graminoids with medium forbs and sphagnum moss. When compared to other ecological sites that are on lowland coastal plains in the survey area, including R236XY133AK (Western Alaska Maritime Graminoid Loamy Plains, Coastal), R236XY135AK (Western Alaska Maritime Scrub Loamy Plains, Coastal), and R236XY170AK (Western Alaska Maritime Graminoid Gravelly Plains, Coastal), this ecological site is distinguished by the presence of surface water, which is indicative of saturated soils that support a hydrophilic plant community. This ecological site is subject to frequent, very long periods of ponding. Ponding is more common and persistent on this ecological site than on the others listed. Differences in soils and disturbance regimes along with ensuing dissimilarities in reference states and community phases make the use of separate ecological sites necessary.

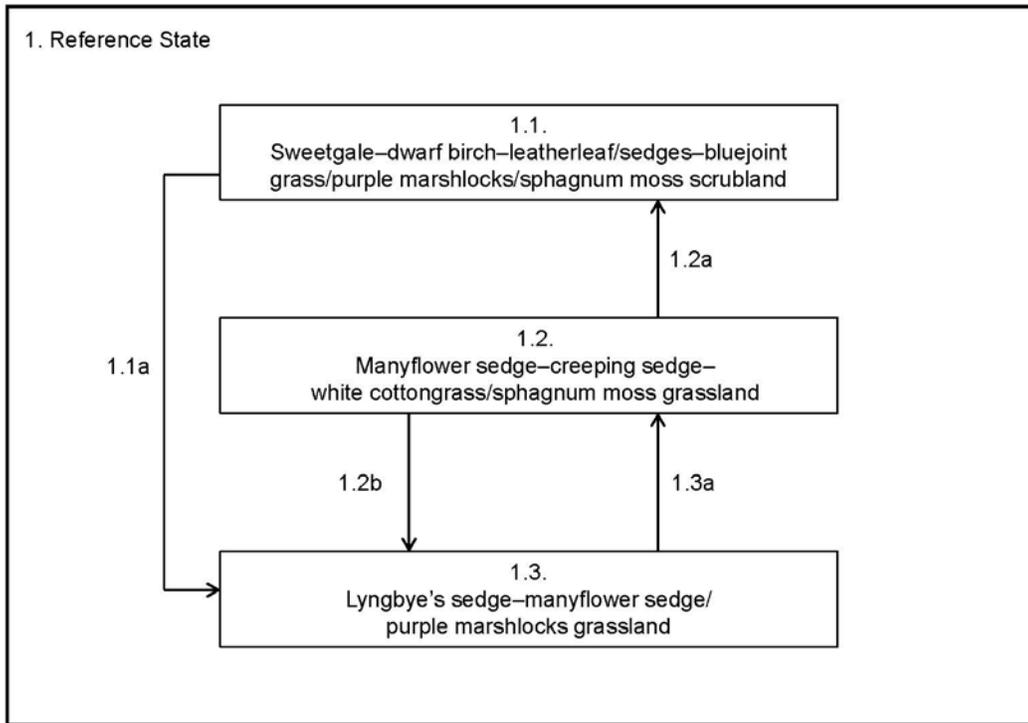
Ponding is the documented disturbance regime for this ecological site, and it is considered to be a natural event that is typically unmanaged. This disturbance regime results in three distinct community phases. The soils on the low coastal plains are very poorly drained soils with a negligible runoff potential, and they are susceptible to very long, frequent periods of ponding from April through October. A year-round water table is present at or just below the surface. The available background information suggests that ponding commonly inhibits access of oxygen to susceptible plants (Hook and Crawford, 1978; Jackson *et al.*, 1991). Hypoxic or anoxic conditions are a major abiotic stress that helps to determine the presence or absence of vascular plants (Vartapetian and Jackson, 1996). The period of ponding that affects plants varies, as temporal tolerance of plants to oxygen deprivation differs among species and may range from many hours to several weeks (Vartapetian and Jackson, 1996). The coastal plains typically are at the upper reaches of tidal activity; therefore, large storm surges may influence the plant composition.

Slight to severe browsing by moose on non-willow shrubs is also possible on this ecological site, but it does not appear to affect the ecological processes significantly enough to alter the communities.

State and Transition Diagram:

Western Alaska Maritime Scrub Peat Plains, Coastal

R236XY129AK



LEGEND
 1.1a, 1.2b = Ponding
 1.2a, 1.3a = Ponding recovery

State ID Number:	1	State Name:	Reference State
State Narrative:	<p>The reference state supports three community phases, grouped by structure and dominance of the vegetation (e.g., shrubs, graminoids, and forbs) and their ecological function and stability. The plant communities are temporally dictated by a ponding regime. The reference community phase is represented by hydrophilic scrubland with water-tolerant graminoids and forbs throughout. No alternative states have been observed.</p> <p>This report provides baseline vegetation inventory data for this ecological site. Future data collection is needed to provide further information about existing plant communities and the disturbance regimes that would result in transitions from one community to another.</p>		

Phase 1.1



Community Phase Number:

1.1

Community Phase Name:

Sweetgale-dwarf birch-leatherleaf/ sedges-bluejoint grass/purple marshlocks/sphagnum moss scrubland

Community Phase Narrative:

The reference community phase for this ecological site is characterized by wet scrubland with water-tolerant forbs and graminoids throughout. Annual plant production is visually estimated to be highest among shrubs followed by graminoids and forbs. Typically, this community consists of a mix of sweetgale (*Myrica gale*), dwarf birch (*Betula nana*), leatherleaf (*Chamaedaphne calyculata*), Alaska bog willow (*Salix fuscescens*), Lyngbye's sedge (*Carex lyngbyei*), bluejoint grass (*Calamagrostis canadensis*), and purple marshlocks (*Comarum palustre*). Other common species include manyflower sedge (*Carex pluriflora*), mud sedge (*Carex limosa*), horsetails (*Equisetum spp.*), and others. Mosses, particularly sphagnum mosses (*Sphagnum spp.*), are common in the ground cover (total mean cover ~44 percent). Other ground cover generally includes herbaceous litter (~46 percent cover). About 9 percent of the surface is covered with water.

Community Phase Canopy Cover

(Vegetation data in the table are provided as constancy (percent) and average canopy cover (percent) of the most dominant and ecologically relevant species for this community phase.)

Plant group	Common name	Scientific name	USDA plant code	Constancy (percent)	Average canopy cover (percent)
S	Sweetgale	<i>Myrica gale</i>	MYGA	100.0	26.8
S	Dwarf birch	<i>Betula nana</i>	BENA	80.0	9.4
S	Alaska bog willow	<i>Salix fuscescens</i>	SAFU	80.0	2.5
S	Leatherleaf	<i>Chamaedaphne calyculata</i>	CHCA2	70.0	5.7
G	Bluejoint grass	<i>Calamagrostis canadensis</i>	CACA4	70.0	13.9
G	Lyngbye's sedge	<i>Carex lyngbyei</i>	CALY3	50.0	22.2
F	Purple marshlocks	<i>Comarum palustre</i>	COPA28	80.0	17.4
M	Sphagnum moss	<i>Sphagnum spp.</i>	SPHAG2#	90.0	42.2

Sphagnum mosses are identified to the genus level.

Community Pathways

Pathway Number	Pathway Name & Description
1.1a	<p>Ponding.</p> <p>It is likely that ponding of the reference community phase will drown many of the plant species. This may then allow pioneer facultative wetland and obligate wetland species to colonize. Some individual forbs, graminoids, and shrubs may persist after ponding.</p> <p>Frequent, very long periods ponding <i>in situ</i> occur from April through October. This combination of frequency and duration appears to be the disturbance pattern regime necessary to drown the facultative to obligate wetland species of the reference community phase, though the transitional timeframe has not been confirmed in the field.</p>
Phase 1.2	

Community Phase Number:	1.2	Community Phase Name:	Manyflower sedge-creeping sedge-white cottongrass/sphagnum moss grassland
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Community Phase Narrative:

This is the late ponding community phase. It is characterized by hydrophilic grassland with sporadic shrubs and forbs throughout. Annual plant productivity is visually estimated to be highest in the graminoid plant group. Overall plant productivity is hypothesized to be less than that of the reference community phase due to less shrub cover, though the opposite may be true in areas of dense graminoids. Typically, this community consists of manyflower sedge (*Carex pluriflora*), creeping sedge (*Carex chordorrhiza*), white cottongrass (*Eriophorum scheuchzeri*), and purple marshlocks (*Comarum palustre*). Also common are Lyngbye's sedge (*Carex lyngbyei*), water sedge (*Carex aquatilis*), Alaska bog willow (*Salix fuscescens*), and sweetgale (*Myrica gale*). The moss cover is generally high (total mean cover ~59 percent), and it typically includes sphagnum mosses (*Sphagnum spp.*). Other ground cover commonly includes herbaceous litter (~63 percent cover). About 3 percent of the surface is covered with water.

Community Phase Canopy Cover

(Vegetation data in the table are provided as constancy (percent) and average canopy cover (percent) of the most dominant and ecologically relevant species for this community phase.)

Plant group	Common name	Scientific name	USDA plant code	Constancy (percent)	Average canopy cover (percent)
S	Alaska bog willow	<i>Salix fuscescens</i>	SAFU	100.0	Trace
S	Sweetgale	<i>Myrica gale</i>	MYGA	75.0	3.0
G	White cottongrass	<i>Eriophorum scheuchzeri</i>	ERSC2	75.0	10.0
G	Manyflower sedge	<i>Carex pluriflora</i>	CAPL6	75.0	20.3
G	Water sedge	<i>Carex aquatilis</i>	CAAQ	50.0	3.5
G	Creeping sedge	<i>Carex chordorrhiza</i>	CACH5	50.0	22.5
F	Purple marshlocks	<i>Comarum palustre</i>	COPA28	100.0	3.5
M	Sphagnum moss	<i>Sphagnum spp.</i>	SPHAG2#	75.0	67.7

Sphagnum mosses are identified to the genus level.

Note: The vegetation and soils for this community were sampled at three separate locations. Due to the limited data available for this community phase, personal field observations were used to aid in describing this plant community.

Community Pathways

Pathway Number	Pathway Name & Description
1.2a	<p>Natural succession: Normal time and growth without disruptive ponding.</p> <p>It is probable that as time passes, extant graminoid and shrub populations will continue to spread. The graminoids and shrubs also will likely increase in species richness as more niches are created and more species are recruited. The time needed for this transition to occur is currently unknown. The reference community phase is comprised of many water-tolerant species, suggesting that the transition time is at least partially limited by the recruitment and growth rate of graminoids and shrubs.</p>

1.2b	<p>Ponding.</p> <p>It is likely that ponding in this community will drown susceptible shrub species. This can create space and decrease the competition for light, allowing less competitive forbs and graminoids to colonize or spread. The ponding duration required to initiate this transition is unknown, but it is hypothesized to be very long because many of the plants in the late ponding community phase are facultative to obligate wetland species, which can survive brief to long periods of ponding.</p>		
Phase 1.3			
Community Phase Number:	1.3	Community Phase Name:	Lyngbye's sedge-manyflower sedge/purple marshlocks grassland
Community Phase Narrative:			
<p>This early ponding community phase is characterized by wet grassland. Annual plant production is visually estimated to be highest among graminoids. Overall plant production is hypothesized to be less than that of the reference community phase due to fewer shrubs and the generally poorer growing conditions, though dense graminoids may make up for any loss in shrub production. Typically, this community consists of various obligate wetland graminoids and forbs, particularly Lyngbye's sedge (<i>Carex lyngbyei</i>), manyflower sedge (<i>Carex pluriflora</i>), purple marshlocks (<i>Comarum palustre</i>), and marsh willowherb (<i>Epilobium palustre</i>). Other species extant in this community include bluejoint grass (<i>Calamagrostis canadensis</i>), tall cottongrass (<i>Eriophorum angustifolium</i>), red cottongrass (<i>Eriophorum russeolum</i>), and water horsetail (<i>Equisetum fluviatile</i>). Mosses are a major component of the ground cover (total mean cover ~41 percent) and generally include sphagnum mosses (<i>Sphagnum spp.</i>). Other ground cover commonly includes herbaceous litter (~69 percent). About 13 percent of the surface is covered with water.</p>			

Community Phase Canopy Cover

(Vegetation data in the table are provided as constancy (percent) and average canopy cover (percent) of the most dominant and ecologically relevant species for this community phase.)

Plant group	Common name	Scientific name	USDA plant code	Constancy (percent)	Average canopy cover (percent)
G	Lyngbye's sedge	<i>Carex lyngbyei</i>	CALY3	100.0	30.4
G	Manyflower sedge	<i>Carex pluriflora</i>	CAPL6	100.0	15.6
G	Bluejoint grass	<i>Calamagrostis canadensis</i>	CACA4	80.0	1.3
G	Tall cottongrass	<i>Eriophorum angustifolium</i>	ERAN6	60.0	1.0
F	Purple marshlocks	<i>Comarum palustre</i>	COPA28	100.0	9.8
F	Marsh willowherb	<i>Epilobium palustre</i>	EPPA	80.0	Trace
M	Sphagnum moss	<i>Sphagnum spp.</i>	SPHAG2 [#]	60.0	32.7

Sphagnum mosses are identified to the genus level.

Community Pathways

Pathway Number	Pathway Name & Description
1.3a	<p>Natural succession: Normal time and growth without disruptive ponding.</p> <p>It is probable that as time progresses, more competitive, water-tolerant species may colonize the early ponding community phase. Forb and graminoid richness may increase as new niches are created and exploited. The time needed for this transition to occur is unknown; however, it is likely to begin once active ponding ceases, as many of the species in the late ponding community phase are facultative to obligate wetland species and do not require a dry soil to grow and reproduce.</p>

Bibliography

- Hook, D. and R.M.M. Crawford. 1978. Plant life in anaerobic environments. Ann Arbor Science Publishers, Inc.
- Jackson M.B., D.D. Davies, and H. Lambers, editors. 1991. Plant life under oxygen deprivation: Ecology, physiology, and biochemistry. The Hague: SPB Academic.
- Vartapetian, Boris B., and Michael B. Jackson. 1996. Plant adaptations to anaerobic stress. Annals of Botany. Volume 79 (Supplement A): 3-20.

This report is interim and subject to change.