USDA Natural Resources Conservation Service

Ecological site R236XY135AK
Western Alaska Maritime Scrub Loamy Plains, Coastal

Last updated: 2/13/2024
Accessed: 05/13/2025

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

MLRA notes

Major Land Resource Area (MLRA): 236X–Bristol Bay-Northern Alaska Peninsula Lowlands

The Bristol Bay-Northern Alaska Peninsula Lowlands Major Land Resource Area (MLRA 236) is in southwest Alaska. It covers 19,575 square miles (USDA–NRCS, 2006) and extends inland from Bristol Bay. It is composed primarily of level to rolling plains and low to moderate hills bordered by long footslopes of mountains (Kautz et al., 2012). The flood plains and terraces along the major rivers and lakes are characterized by depressions and small basins. Mountains form the eastern and western borders of the MLRA, and glacially formed lakes are behind terminal moraines (Kautz et al., 2012). The entire MLRA was covered by glacial ice during the early to middle Pleistocene (USDA–NRCS, 2006).

The climate near the coast is dominantly maritime, and the climate farther inland is continental and is influenced by weather systems of Interior Alaska (Kautz et al., 2012). Summers typically are warm and short, and winters are long and cold. The average annual precipitation is 13 to 50 inches, and the average annual air temperature is 30 to 36 degrees F (Kautz et al., 2012). The freeze-free period normally is 70 to 125 days. Aspect and elevation, which ranges from sea level to about 2,500 feet above sea level (USDA–NRCS, 2006), influence the climate and weather patterns.

This MLRA is sparsely populated. The major communities include Dillingham, Naknek, and King Salmon. Federally managed land in the MLRA includes parts of Katmai National Park and Preserve and the Aniakchak National Monument and Preserve as well as Togiak and Alaska Peninsula National Wildlife Refuges (Kautz et al., 2012; USDA–NRCS, 2006).

Ecological site concept

Site R236XY135AK is along tidal gluts of coastal plains. The unique hydrologic processes, including ponding, flooding, and a high water table, produce a unique combination of soils and vegetation. The reference plant community is closed low scrubland (Viereck et al., 1992) that consists of willow, bluejoint, and various forbs.

Associated sites

R236XY129AK	**Subarctic Low Scrub Peat Coastal Plains** Several other ecological sites are also on the lowland coastal plains in MLRA 236, including site R236XY129AK (Western Alaska Maritime Scrub Peat Plains, Coastal). Site R236XY135AK is the only one adjacent to tidal guts and it does not have silt, gravel, or water on the surface; therefore, unique ecological sites are needed.
R236XY133AK	**Subarctic Graminoid Loamy Tidal Coastal Plains** Several other ecological sites are also on the lowland coastal plains in MLRA 236, including site R236XY133AK (Western Alaska Maritime Graminoid Loamy Plains, Coastal). Site R236XY135AK is the only one adjacent to tidal guts and it does not have silt, gravel, or water on the surface; therefore, unique ecological sites are needed.

R236XY170AK	**Subarctic Graminoid Loamy Coastal Plain Rises** Several other ecological sites are also on the lowland coastal plains in MLRA 236, including site R236XY170AK (Western Alaska Maritime Graminoid Gravelly Plains, Coastal). Site R236XY135AK is the only one adjacent to tidal guts. Sites R236XY135AK and R236XY170AK do not have silt, gravel, or water on the surface. Site R236XY135AK is at lower elevations and the soil is less easily drained; therefore, it is wetter than site R236XY170AK and supports facultative or obligate wetland plants that are not in site R236XY170AK. Unique ecological sites are needed.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Salix pulchra* (2) *Salix barclayi*
Herbaceous	(1) *Calamagrostis canadensis* (2) *Comarum palustre*

Physiographic features

Site characteristics specifically relate to the reference plant community phase. Each ecological site has a specific set of site characteristics and disturbance dynamics that results in a unique plant community composition, structure, and function. Site characteristics (climate, geology, topography, and soil characteristics) are dynamic across a landscape. Subtle changes in site characteristics can result in a different plant community phase or ecological site. Definitions of site characteristics are provided in the United States Department of Agriculture Handbook 296 (USDA-NRCS, 2006), Geomorphic Description System (Schoeneberger and Wysocki, 2012), Field Book for Describing and Sampling Soils (Schoeneberger et al., 2012), and Soil Survey Manual (Soil Science Division Staff, 2017).

Table 2. Representative physiographic features

Landforms	(1) Coastal plain > Tidal inlet
Flooding duration	Extremely brief (0.1 to 4 hours)
Flooding frequency	None to frequent
Ponding duration	Brief (2 to 7 days)
Ponding frequency	Occasional
Elevation	0–6 m
Slope	0%
Aspect	W, NW, N, NE, E, SE, S, SW

Climatic features

Climate of land resource region (LRR): Maritime continental (Western Regional Climate Center, 2017); short, warm summers and long, cold winters (USDA–NRCS, 2006).

Climate of major land resource area (MLRA): Maritime by the coast; continental inland and at higher elevations (influenced by Interior Alaska weather systems). The average annual precipitation is 13 to 50 inches, and the average annual air temperature is 30 to 36 degrees F (USDA–NRCS, 2006).

Influencing water features

Soil features

This ecological site is correlated to D36-Western maritime scrub silty coastal plains and Typic Cryaquents. These soils have a cryic temperature regime and an aquic moisture regime. The saturated hydraulic conductivity is moderately low to a depth of 40 inches. The upper layer is very strongly acid to moderately acid (pH 5.0 to 6.0), and

it has an organic matter content of 50 to 80 percent. The soils are poorly drained. The parent material is a thin layer of grassy organic material over silty marine deposits.

Table 3. Representative soil features

Parent material	(1) Marine deposits
Drainage class	Poorly drained

Ecological dynamics

Overview

Site R236XY135AK is along tidal gluts of coastal plains. The biotic and abiotic characteristics associated with tidal gluts create an ecological site distinct from the other sites on the coastal plains. The other sites are identified by the presence of surface water (R236XY129AK), surface silt (R236XY133AK), and gravelly soil (R236XY170AK). Areas along tidal gluts do not have these surface characteristics. Hydrologic processes, including ponding, flooding, and a high water table, create a unique combination of soils and vegetation in site R236XY135AK.

Two communities are in the reference state. The reference plant community is closed low scrubland (Viereck et al., 1992) that consists of willow, bluejoint, and various forbs. The lower lying areas likely hold water and support community 1.2.

Disturbance Dynamics

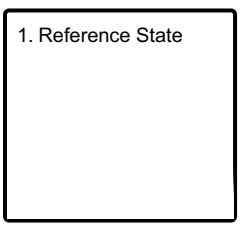
Flooding, ponding, and water table influences
This site is susceptible to hydrologic processes, including ponding, flooding, and a shallow water table, because of the low elevation, minimal slope, poorly drained soils, and proximity to the coast . Tidal gluts are subject to occasional, brief periods of ponding during the growing season (April through October), which may affect the composition of the plant community. The hypoxic or anoxic condition is a major abiotic stress that affects the presence or absence of vascular plants (Vartapetian and Jackson, 1996). The very shallow water table in April and May compounds the effects of ponding. Periods of flooding are extremely brief, but they provide water that may pond. Coastal flooding in Alaska can influence the distribution and abundance of plant species in disturbed areas (Pollock et al., 1998; Pennings and Callaway, 1992).

Other Observations

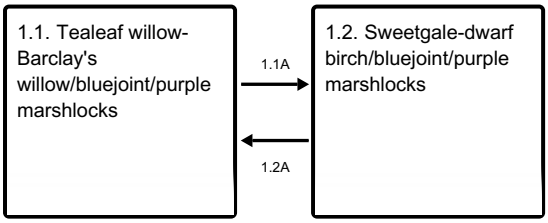
Moderate browsing of willow by moose may occur on this ecological site, but it does not appear to affect the ecological processes significantly enough to alter the communities.

State and transition model

Ecosystem states



State 1 submodel, plant communities



1.1A - Increased hydrological pressures.

1.2A - Decreased hydrological influences.

State 1
Reference State

The reference state supports two community phases, which distinguished by developed structure and dominance of the vegetation and by their ecological function and stability. The reference community phase is dense scrubland. The presence of each community is dictated temporally by the frequent periods of flooding. This report provides baseline inventory data for the vegetation in the ecological site. Future data collection is needed to provide further information about existing plant communities and the disturbance regime that results in transitions from one community to another. Common and scientific names are from the USDA PLANTS database. Community phases are characterized by the Alaska Vegetation Classification System (Viereck et al., 1992).

Community 1.1
Tealeaf willow-Barclay's willow/bluejoint/purple marshlocks

Community Phase 1.1 Canopy Cover Table

Vegetation data is aggregated across modal sample plots for this community phase and is provided as frequency (percent) and mean canopy cover (percent) of the most dominant and ecologically relevant species. Canopy cover is represented as a mean with the range in parentheses.

Plant group	Common name	Scientific name	USDA plant code	Frequency (percent)	Mean canopy cover (percent)
S	Tealeaf willow	*Salix pulchra*	SAPU15	100	60
S	Barclay's willow	*Salix barclayi*	SABA3	100	20
G	Bluejoint grass	*Calamagrostis canadensis*	CACA4	100	50
F	Purple marshlocks	*Comarum palustre*	COPA28	100	15
F	Western water hemlock	*Cicuta douglasii*	CIDO	100	Trace

This dataset includes data from 1 sample plot. The sample plots are distributed across the survey area and are independent of one another. Due to the limited data available for this community phase, personal field observations were also used to aid in describing the vegetative community.

Plant functional group classifications—T = trees, S = shrubs, G = graminoids, F = forbs, B = bryophytes, L = lichens

Canopy cover data is rounded, except trace (0.1 percent) cover. Data ranging from 1 to 9 percent cover is rounded to the nearest integer. Data ranging from 10 to 100 percent cover is rounded to the nearest factor of 5.

Figure 1. Frequency and canopy cover of plants in community 1.1.

The reference plant community is closed low scrubland (Viereck et al., 1992) that consists of tealeaf willow (*Salix pulchra*) and Barclay's willow (*Salix barclayi*) in the medium stratum (3 to 10 feet tall) and an understory of bluejoint (*Calamagrostis canadensis*) and purple marshlocks (*Comarum palustre*). Other hydrophilic species may include field horsetail (*Equisetum arvense*), tall Jacob's-ladder (*Polemonium acutiflorum*), seacoast angelica (*Angelica lucida*), marsh pea (*Lathyrus palustris*), and western water hemlock (*Cicuta douglasii*). Concentrations of mosses are low, and concentrations of lichens are negligible. The ground cover consists of herbaceous litter, woody litter, and water.

Dominant plant species

- tealeaf willow (*Salix pulchra*), shrub
- Barclay's willow (*Salix barclayi*), shrub
- bluejoint (*Calamagrostis canadensis*), grass
- purple marshlocks (*Comarum palustre*), other herbaceous
- western water hemlock (*Cicuta douglasii*), other herbaceous

Community 1.2
Sweetgale-dwarf birch/bluejoint/purple marshlocks

Figure 2. Typical area of community 1.2.

Community Phase 1.2 Canopy Cover Table

Vegetation data is aggregated across modal sample plots for this community phase and is provided as frequency (percent) and mean canopy cover (percent) of the most dominant and ecologically relevant species. Canopy cover is represented as a mean with the range in parentheses.

Plant group	Common name	Scientific name	USDA plant code	Frequency (percent)	Mean canopy cover (percent)
S	Sweetgale	*Myrica gale*	MYGA	100	30
S	Dwarf birch	*Betula nana*	BENA	100	15
G	Bluejoint grass	*Calamagrostis canadensis*	CACA4	100	10
F	Purple marshlocks	*Comarum palustre*	COPA28	100	10

This dataset includes data from 1 sample plot. The sample plots are distributed across the survey area and are independent of one another. Due to the limited data available for this community phase, personal field observations were also used to aid in describing the vegetative community.

Plant functional group classifications—T = trees, S = shrubs, G = graminoids, F = forbs, B = bryophytes, L = lichens

Canopy cover data is rounded, except trace (0.1 percent) cover. Data ranging from 1 to 9 percent cover is rounded to the nearest integer. Data ranging from 10 to 100 percent cover is rounded to the nearest factor of 5.

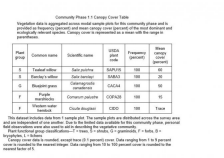
Figure 3. Frequency and canopy cover of plants in community 1.2.

This wetter community is open low scrubland (Viereck et al., 1992) that consists of various shrubs, including sweetgale (*Myrica gale*), dwarf birch (*Betula nana*), spirea (*Spiraea stevenii*), and willows. The most common and abundant understory species are bluejoint and purple marshlocks. Other species include Lyngbye's sedge (*Carex lyngbyei*), angelica, fragrant bedstraw (*Galium triflorum*), and tall Jacob's-ladder. The ground cover includes mosses and herbaceous litter.

Dominant plant species

- sweetgale (*Myrica gale*), shrub
- dwarf birch (*Betula nana*), shrub
- bluejoint (*Calamagrostis canadensis*), grass
- purple marshlocks (*Comarum palustre*), other herbaceous

Pathway 1.1A
Community 1.1 to 1.2



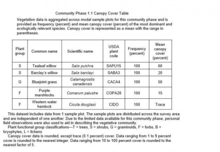
Tealeaf willow-Barclay's willow/bluejoint/purple marshlocks

Sweetgale-dwarf birch/bluejoint/purple marshlocks

Increased hydrological pressures. The lower lying areas likely are subject to more frequent or longer periods of ponding and are more acutely affected by flooding. Because of the increased amount of water, these areas dominantly support facultative wet and obligate wetland species.

Pathway 1.2A
Community 1.2 to 1.1

Sweetgale-dwarf birch/bluejoint/purple marshlocks



Community Phase 1.1 Canopy Cover Table

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S	Tealeaf willow	*Salix pulchra*	SAPU15	100	60
S	Barclay's willow	*Salix barclayi*	SABA3	100	20
G	Bluejoint grass	*Calamagrostis canadensis*	CACA4	100	50
F	Purple marshlocks	*Comarum palustre*	COPA28	100	15
F	Western water hemlock	*Cicuta douglasii*	CIDO	100	Trace

This dataset includes data from 1 sample plot. The sample plots are distributed across the survey area and are independent of one another. Due to the limited data available for this community phase, personal field observations were also used to aid in describing the vegetative community.
Plant functional group classifications—T = trees, S = shrubs, G = graminoids, F = forbs, B = bryophytes, L = lichens
Canopy cover data is rounded, except trace (0.1 percent) cover. Data ranging from 1 to 9 percent cover is rounded to the nearest integer. Data ranging from 10 to 100 percent cover is rounded to the nearest factor of 5.

Tealeaf willow-Barclay's willow/bluejoint/purple marshlocks

Decreased hydrological influences. Areas that have less water support slower growing, slightly less hydrophilic plants. The competitive advantage of facultative wet and obligate wetland species is reduced, which allows the populations of other plants to expand.

Additional community tables

Other references

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Approval

Kirt Walstad, 2/13/2024

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	05/13/2025
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

2. **Presence of water flow patterns:**

3. **Number and height of erosional pedestals or terracettes:**

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

5. **Number of gullies and erosion associated with gullies:**

6. **Extent of wind scoured, blowouts and/or depositional areas:**

7. **Amount of litter movement (describe size and distance expected to travel):**

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant:

    Sub-dominant:

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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14. **Average percent litter cover (%) and depth (in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**

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17. **Perennial plant reproductive capability:**
