

Ecological site R236XY128AK

Western Alaska Maritime Dwarf Scrub Loamy Slopes, Steep

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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.

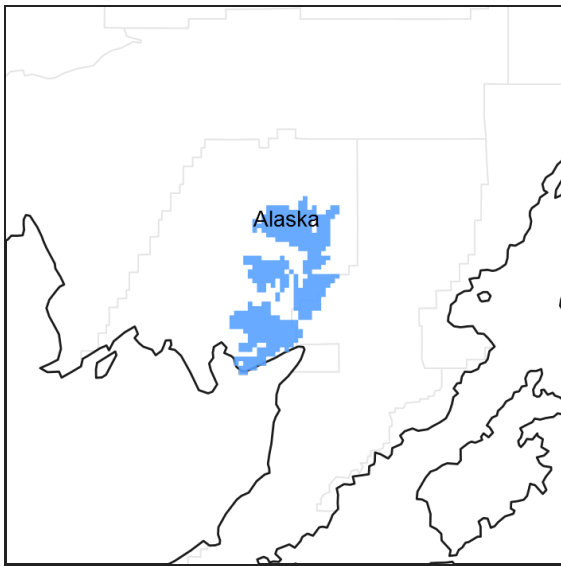


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

MLRA notes

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

MLRA 236 is in the western region of Alaska. It covers approximately 19,575 square miles and extends inland from Bristol Bay. It is defined by an expanse of nearly level to rolling lowlands, uplands, and low to moderate hills bordered by long footslopes of mountains. The climate near the coast is dominantly maritime, but the weather systems of Interior Alaska may have a strong influence on inland areas. The entire MLRA was covered by glacial ice during the early to middle Pleistocene. MLRA 236 is dominantly sparsely populated, undeveloped wildland. The communities of Dillingham and King Salmon and other villages are in the MLRA.

Ecological site concept

Information about the ecological site concept is in the "Ecological Dynamics" section.

This report provides baseline inventory data for the vegetation in 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.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Vaccinium uliginosum</i> (2) <i>Empetrum nigrum</i>
Herbaceous	(1) <i>Calamagrostis canadensis</i> (2) <i>Chamerion angustifolium</i>

Physiographic features

Information about the physiographic features is in the "Ecological Dynamics" section.

Table 2. Representative physiographic features

Landforms	(1) Rise (2) Terrace
Elevation	3–293 m
Slope	6–40%
Aspect	Aspect is not a significant factor

Climatic features

Influencing water features

Information about the water features is in the "Ecological Dynamics" section.

Soil features

Information about the soil features is in the "Ecological Dynamics" section. More in-depth soils information is in the soil survey reports.

Ecological dynamics

This maritime ecological site is on steep, short (less than 10 feet) risers of eolian terraces on upland plains and hills in western Alaska. Elevation typically ranges from 10 to 960 feet above sea level, and slopes are 6 to 40 percent. This site is on all aspects; therefore, aspect does not appear to influence the plant community dynamics.

This site is correlated to D36-Western maritime scrub eolian terraces. This soil has a cryic temperature regime and a udic moisture regime. The saturated hydraulic conductivity is moderately low to a depth of 40 inches. The upper layer is extremely acid to strongly acid (pH 3.9 to 5.5), and it has an organic matter content of 15 to 33 percent. The annual precipitation is 21 to 49 inches, and the annual frost-free period is 80 to 140 days. The parent material is coarse-loamy cryoturbate over coarse-loamy eolian deposits.

The reference community phase is typified by low and dwarf scrubland that has pockets of graminoids and forbs. As compared to other maritime ecological sites on upland hills and plains, this site is unique because it is on short, steep slopes. The other ecological sites are in depressions, on earth hummocks, and along lake margins. These sites are associated with different soils and have different disturbance regimes from those of this site. These differences and the dissimilarities in reference states and community phases make the use of unique ecological sites necessary.

Erosion from animal movement or nearby frost heave that is exacerbated by wind, rain, or landslides is the hypothesized disturbance regime for this ecological site. This disturbance regime results in two distinct community phases. The steep, short slopes may be subject to erosion if the plant cover is removed. Slight or moderate browsing of the reference community phase has been observed, which suggests that animal movement may not have to be severe to facilitate a change in the plant community. After the vegetation is removed, wind, rain, or

landslides may increase the impact of the disturbance. Further research and onsite investigation are needed to determine the full impact of erosion.

State and transition model

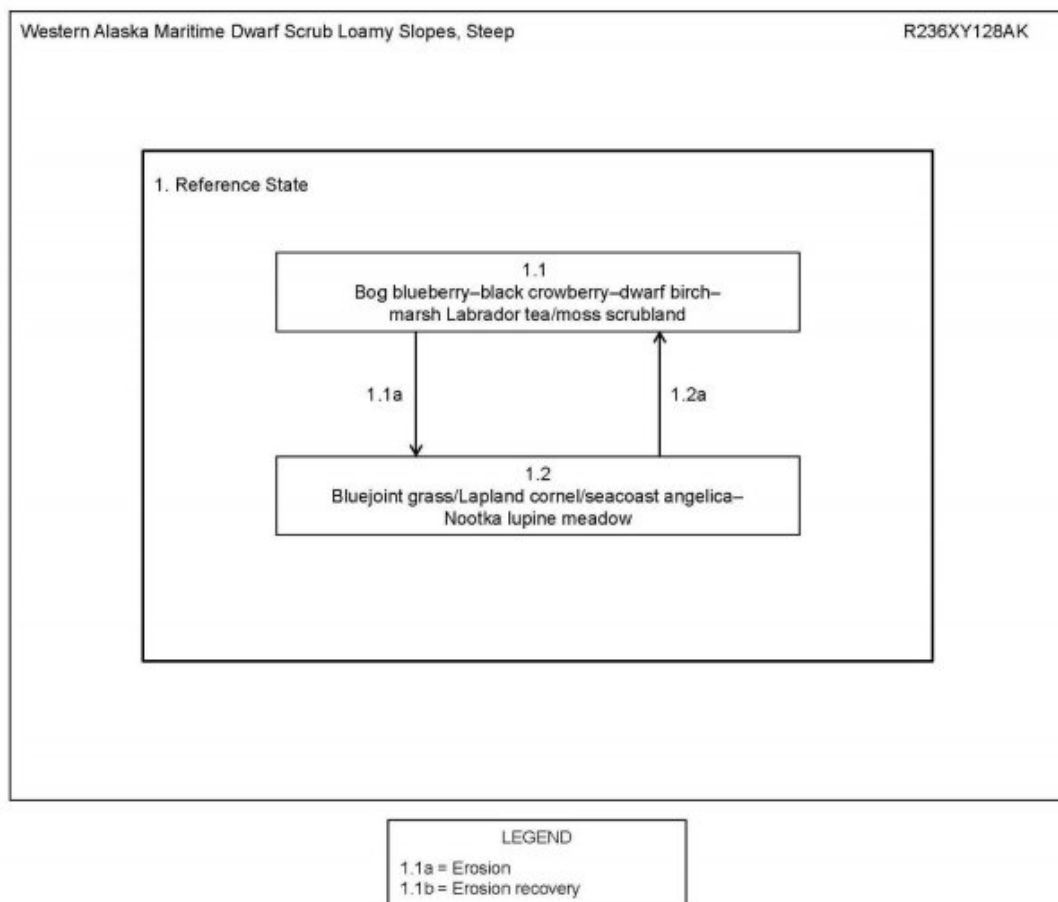


Figure 2. State-and-transition model.

State 1 Reference State

The reference state supports two community phases, which are grouped by the structure and dominance of the vegetation (e.g., shrubs, graminoids, and forbs) and by their ecological function and stability. The presence of these two communities is dictated temporally by erosion. The reference community phase is characterized by dense scrubland consisting of low and dwarf shrubs. No alternate states have been observed.

Community 1.1 Bog blueberry-black crowberry-dwarf birch-marsh Labrador tea/moss scrubland



Figure 3. Community 1.1

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	Bog blueberry	<i>Vaccinium uliginosum</i>	VAUL	100	30
S	Black crowberry	<i>Empetrum nigrum</i>	EMNI	100	20
S	Dwarf birch	<i>Betula nana</i>	BENA	100	10
S	Marsh Labrador tea	<i>Ledum palustre</i> ssp. <i>decumbens</i>	LEPAD	100	8
S	Beauverd spirea	<i>Spiraea stevenii</i>	SPST3	100	6
G	Bluejoint grass	<i>Calamagrostis canadensis</i>	CACA4	100	2

Figure 4. Constancy and canopy cover of plants in community 1.1.

The reference community phase is characterized by a dense scrubland of low and dwarf shrubs. Typically, this community consists of bog blueberry (*Vaccinium uliginosum*), black crowberry (*Empetrum nigrum*), dwarf birch (*Betula nana*), marsh Labrador tea (*Ledum palustre* ssp. *decumbens*), spirea (*Spiraea stevenii*), and bluejoint grass (*Calamagrostis canadensis*). Other extant species may include fireweed (*Chamerion angustifolium*), twinflower (*Linnaea borealis*), arctic starflower (*Trientalis europaea*), low and dwarf willows (*Salix* spp.), and clubmosses (*Lycopodium* spp.). Individual white spruce (*Picea glauca*) and Kenai birch (*Betula papyrifera* var. *kenaica*) trees from adjacent areas may become colonized, but a sustainable population likely cannot establish. The ground cover generally consists of mosses (about 40 percent cover), lichens (about 10 percent), herbaceous litter (about 55 percent), and woody litter (about 3 percent). About 1 percent is bare soil.

Community 1.2

Bluejoint grass/Lapland cornel/seacoast angelica-Nootka lupine meadow



Figure 5. Typical area of community 1.2.

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	Lapland cornel	<i>Cornus suecica</i>	COU4	100	7
G	Bluejoint grass	<i>Calamagrostis canadensis</i>	CACA4	100	35
F	Seacoast angelica	<i>Angelica lucida</i>	ANLU	100	7
F	Nootka lupine	<i>Lupinus nootkatensis</i>	LUNO	100	7
F	Fireweed	<i>Chamerion angustifolium</i>	CHAN9	100	Trace

Figure 6. Constancy and canopy cover of plants in community 1.2.

This early erosional community phase is characterized by grassland that has forbs and some shrubs dispersed throughout. Typically, this community consists of bluejoint grass (*Calamagrostis canadensis*), Lapland cornel (*Cornus suecica*), seacoast angelica (*Angelica lucida*), and Nootka lupine (*Lupinus nootkatensis*). Other species may include tealeaf willow (*Salix pulchra*), arctic raspberry (*Rubus arcticus*), woolly geranium (*Geranium erianthum*), beachhead iris (*Iris setosa*), and fireweed (*Chamerion angustifolium*). The ground cover is dominantly herbaceous litter (about 95 percent total mean cover). Other species are mosses (about 5 percent) and woody litter (about 2 percent). Note: The vegetation and soils for this community were sampled at one location. Due to the limited data available, personal field observations were used to aid in describing the plant community.

**Pathway 1.1a
Community 1.1 to 1.2**



Bog blueberry-black
crowberry-dwarf birch-marsh
Labrador tea/moss scrubland



Bluejoint grass/Lapland
cornel/seacoast angelica-
Nootka lupine meadow

Erosion. This site may be subject to erosion by wind, rain, and landslides as a result of the loss of plant cover from browsing, animal movement, or nearby frost heave. Post-disturbance, unvegetated areas generally will be populated by fast-growing, pioneer species of graminoids and forbs. This transition is expected to begin immediately after major erosion.

**Pathway 1.2a
Community 1.2 to 1.1**



Bluejoint grass/Lapland
cornel/seacoast angelica-
Nootka lupine meadow



Bog blueberry-black
crowberry-dwarf birch-marsh
Labrador tea/moss scrubland

Natural succession: Normal time and growth without disruptive erosion. As this community develops, the landform likely will stabilize and organic matter from senescent pioneers will accumulate. Low and dwarf shrubs that can compete for light and space and withstand the abiotic conditions on the exposed, steep slopes likely will colonize and reproduce. The period needed for this transition is unknown. It likely depends at least partially on the rates of colonization, growth, and reproduction of shrubs.

Additional community tables

Contributors

Phil Barber
Steph Schmit
Michael Margo
Sue Tester
Kendra Moseley

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	07/17/2024
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):**
-
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**
-
11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**
-
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:
-
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**
-
14. **Average percent litter cover (%) and depth (in):**
-
15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**
-
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:**
-
17. **Perennial plant reproductive capability:**
-

