Ecological site R237XY206AK
Western Alaska Maritime Dwarf Scrubland Loamy Drainage, High Elevation

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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.

MLRA notes

Major Land Resource Area (MLRA): 237X–Ahklun Mountains

The Ahklun Mountains Major Land Resource Area (MLRA 237) is in western Alaska (fig. 3). This MLRA covers approximately 14,555 square miles, and it includes the mountains, hills, and valleys of the Kilbuck Mountains in the north and the Ahklun Mountains in the south. Except for the Kilbuck Mountains and the highest ridges of the Ahklun Mountains, the MLRA was extensively glaciated during the Pleistocene (Kautz et al., 2004). Today, a few small glaciers persist in mountainous cirques (Gallant et al., 1995). The present-day landscape and landforms reflect this glacial history; glacial moraines and glacial drift cover much of the area (USDA-NRCS, 2006). The landscape of the MLRA is primarily defined by low, steep, rugged mountains cut by narrow-to-broad valleys. Flood plains and terraces of varying sizes are common at the lower elevations in the valley bottoms. Glacially carved valleys host many lakes. Togiak Lake is one of the largest lakes in the region. It is 13 miles long and about 9,500 acres in size. Major rivers include the Goodnews, Togiak, Kanektok, Osviak, Eek, and Arolik Rivers. Where the Goodnews and Togiak Rivers reach the coast, the nearly level to rolling deltas support numerous small lakes. This MLRA has two distinct climatic zones: subarctic continental and maritime continental (fig. 4). The high-elevation areas are in the subarctic continental zone. The mean annual precipitation is more than 75 inches, and the mean annual air temperature is below about 27 degrees F (-3 degrees C) in extreme locations. The warmer, drier areas at the lower elevations are in the maritime continental zone. The mean annual precipitation is 20 to 50 inches, and the mean annual air temperature is about 30 to 32 degrees F (-0.2 to 1.2 degrees C) (PRISM). This climatic zone is influenced by both maritime and continental factors. The temperatures in summer are moderated by the open waters of the Bering Sea, and the temperatures in winter are more continental due to the presence of ice in the sea (Western Regional Climate Center, 2017). The seasonal ice reaches its southernmost extent off the coast of Alaska in Bristol Bay (Alaska Climate Research Center, 2017). The western coast of Alaska is also influenced by high winds from strong storms and airmasses in the Interior Region of Alaska (Hartmann, 2002). The Ahklun Mountains MLRA is principally undeveloped wilderness. Federally managed lands include the Togiak and Alaska Maritime National Wildlife Refuges. The MLRA is sparsely populated, but it has several communities, including Togiak, Manokotak, Twin Hills, and Goodnews Bay. Togiak is the largest village. It has a population of approximately 855, most of which are Yup'ik Alaska Natives (U.S. Census Bureau, 2016). Major land uses include subsistence activities (fishing, hunting, and gathering) and wildlife recreation (USDA-NRCS, 2006; Kautz et al., 2004).

Ecological site concept

Ecological site R237XY206AK is in drainageways of mountainous alpine areas. The soils associated with the site are somewhat poorly drained or poorly drained, and they have an aquic moisture regime. The reference state has two distinct community phases that are dictated spatially by snowpack and seepage--the reference plant community and an early seepage community phase. No alternate state was recorded for this ecological site. The reference plant community is a willow dwarf scrubland (Viereck et al., 1992). Willows may include netleaf willow (Salix reticulata), arctic willow (S. arctica), and sprouting leaf willow (S. stolonifera). Other plants include Canadian burnet (Sanguisorba canadensis), Rocky Mountain goldenrod (Solidago multiradiata), Alaska bellheather (Harrimanella stelleriana), shrubby cinquefoil (Dasiphora fruticosa), and tufted hairgrass (Deschampsia cespitosa).

Associated sites

R237XY217AK	**Western Alaska Maritime Dwarf Scrubland Gravelly Slopes, High Elevation** Ecological site R237XY206AK is in alpine drainageways that may dissect other alpine sites. Common associated sites are R237XY217AK on alpine summits and R237XY218AK on backslopes. They typically are differentiated by one or more criteria, including landform, landform position, associated soils, associated disturbance regimes, and the type and amount of plants. Other ecological sites that may be associated with site R237XY206AK include R237XY202AK, R237XY204AK, and R237XY205AK. Ecotonal plant communities that have characteristics of more than one ecological site are in areas where these sites abut.
R237XY218AK	**Western Alaska Maritime Dwarf Scrubland Gravelly Slopes, Concave** Ecological site R237XY206AK is in alpine drainageways that may dissect other alpine sites. Common associated sites are R237XY217AK on alpine summits and R237XY218AK on backslopes. They typically are differentiated by one or more criteria, including landform, landform position, associated soils, associated disturbance regimes, and the type and amount of plants. Other ecological sites that may be associated with site R237XY206AK include R237XY202AK, R237XY204AK, and R237XY205AK. Ecotonal plant communities that have characteristics of more than one ecological site are in areas where these sites abut.

Similar sites

R237XY205AK	**Western Alaska Maritime Scrubland Loamy Swales** Ecological site R237XY205AK is in concave areas of plains, and it supports a reference plant community similar to that of site R237XY206AK. Both sites support a community of willow and hydrophilic forbs and graminoids, but site R237XY205AK supports dense stands of medium to tall willow species. Site R237XY206AK is in alpine areas where the willow commonly is dwarf species. Both sites are affected by hydrophilic disturbances and the length and intensity of disturbances. Differences in landform, plant communities, and disturbance regimes require the use of separate ecological sites.

Figure 1. This ecological site typically is in defined alpine drainageways. Seepage occurs when the drainageway cannot remove soil moisture quickly enough.

Figure 2. Snowpack can remain in the drainageways into the growing season, which affects plant growth.

Table 3. Dominant plant species

Tree	Not specified
Shrub	(1) *Salix* (2) *Harrimanella stelleriana*
Herbaceous	(1) *Sanguisorba canadensis* (2) *Deschampsia caespitosa*

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).

Figure 1. The Ahklun Mountains area (MLRA 237) is in western Alaska.

Figure 2. High-elevation and low-elevation map units in the area, which illustrate the primary climatic influence.

Table 4. Representative physiographic features

Slope shape across	(1) Concave
Geomorphic position, mountains	(1) Mountainflank
Slope shape up-down	(1) Linear
Landforms	(1) Mountains > Drainageway
Flooding frequency	None
Ponding frequency	None
Elevation	200 – 1,250 m
Slope	10 – 40 %
Water table depth	0 – 50 cm
Aspect	W, NW, N, NE, E

Climatic features

Climate of land resource region (LLR): 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 continental in the lowlands and subarctic continental at higher elevations. The mean annual precipitation is 20 to 30 inches in the lowlands, and it increases to more than 45 inches at the higher elevations. The mean annual air temperature along the coast is about 34 degrees F (1 degree C) (PRISM, 2014). Strong winds are common throughout the year.

Climatic influences play a role in determining the composition of plants in the reference state. Extended periods of snowpack in the north-facing drainageways limit the growing season. Plants must be adapted to cool temperatures and wet soil conditions, which are partially dictated by the alpine climate. It is suspected that changes in the local climate will result in changes in the reference state communities. Warmer temperatures may allow for colonization of species more common at lower elevations, such as alder (Alnus spp.). Further research is needed to model shifts in the communities due to climate change.

Table 5 Representative climatic features

Frost-free period (characteristic range)	60-140 days
Freeze-free period (characteristic range)	

Precipitation total (characteristic range)	

Influencing water features

Soil features

Cryaquepts, cool, are correlated to this ecological site. These soils are somewhat poorly drained or poorly drained and have an aquic moisture regime. The saturated hydraulic conductivity of the soils is high or very high throughout. The soils are moderately acid to neutral.

Table 6. Representative soil features

Drainage class	Poorly drained to somewhat poorly drained

Ecological dynamics

Alpine mountain zones support several ecological sites that are not in any other area. Site R237XY217AK is on summits that support one community. Sites R237XY218AK and R237XY219AK are on backslopes and are differentiated by slope. Site R237XY205AK is in swales of lower backslopes and plains, and site R237XY206AK is in drainageways.

Site R237XY206AK is in concave drainageways on upper mountain slopes throughout the Ahklun Mountains area (figs. 1 and 6). Aspect, elevation, alpine climate, landform, and soil characteristics create a unique ecological site that supports two plant communities. The wet soils restrict the species that can grow in this site. The site is primarily on northerly aspects of 270 to 90 degrees, which restricts the growing season. The concave slopes protect the site from wind. Snowpack lasts into the growing season, which influences the plants in the reference plant community and contributes to the disturbance that results in the early community phase.

Disturbance Dynamics

Seepage
Seepage due to seasonal snowmelt and precipitation is the primary disturbance in these drainageways. Precipitation and snowmelt can inundate the drainageways with water more quickly than the soils can remove it (figs. 2 and 8). Areas adjacent to the surface drainage are wetter and are subject to longer periods of seepage. These areas correspond to community phase 1.2. Areas farther from the surface drainage typically are subject to less intense, shorter periods of seepage and support the reference plant community (1.1).

Other Observations
Browsing by moose and caribou on willow and forbs is documented in the reference plant community. The browsing does not disturb the plant community enough to require an early browse phase or an alternate state.

No alternate states were observed for this ecological site.

State and transition model

Figure 3. State-and-transition model.

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 8. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Other references

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Approval

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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	09/23/2026
Approved by	
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:

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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:**
