

Ecological site R237XY208AK

Western Alaska Maritime Scrubland Peat Depressions

Last updated: 7/23/2020
Accessed: 04/22/2026

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 R237XY208AK is in organic depressions of flood plains, plains, mountain valleys, and shore complexes throughout the Ahklun Mountains area. Landform, soil characteristics, and hydrology influence the existing plants and create a unique ecological site. This site is correlated to four distinct, very poorly drained soils. The reference state supports the reference plant community and an early community phase caused by ponding. The reference plant community is an open low scrubland (Viereck et al., 1992). Facultative and obligate wetland plants are dominant in this community. Common plants include dwarf birch (*Betula nana*), bog blueberry (*Vaccinium uliginosum*), black crowberry (*Empetrum nigrum*), cloudberry (*Rubus chamaemorus*), sweetgale (*Myrica gale*), water sedge (*Carex aquatilis*), and tufted bulrush (*Trichophorum cespitosum*).

Associated sites

<p>R237XY226AK</p>	<p>Western Alaska Maritime Grassland Peat Flood Plains, Depression</p> <p>Ecological site R237XY208AK is in organic depressions of plains, mountain valleys, flood plains, and shore complexes. Dominant ecological sites associated with this site include R237XY201AK, R237XY205AK, R237XY215AK, R237XY220AK, R237XY222AK, R237XY223AK, R237XY226AK, and R237XY236AK. These sites typically are differentiated by one or more criteria, including landform, landform position, associated soils, associated disturbance regimes, and the type and amount of plants. Ecotonal plant communities that have characteristics from more than one ecological site are in areas where these sites abut. This is especially noticeable in smaller depressions where species from surrounding sites extend farther into the depressional area.</p>
<p>R237XY220AK</p>	<p>Western Alaska Maritime Mosaic Loamy Hummocks</p> <p>Ecological site R237XY208AK is in organic depressions of plains, mountain valleys, flood plains, and shore complexes. Dominant ecological sites associated with this site include R237XY201AK, R237XY205AK, R237XY215AK, R237XY220AK, R237XY222AK, R237XY223AK, R237XY226AK, and R237XY236AK. These sites typically are differentiated by one or more criteria, including landform, landform position, associated soils, associated disturbance regimes, and the type and amount of plants. Ecotonal plant communities that have characteristics from more than one ecological site are in areas where these sites abut. This is especially noticeable in smaller depressions where species from surrounding sites extend farther into the depressional area.</p>
<p>R237XY222AK</p>	<p>Western Alaska Maritime Scrubland Loamy Hummocks</p> <p>Ecological site R237XY208AK is in organic depressions of plains, mountain valleys, flood plains, and shore complexes. Dominant ecological sites associated with this site include R237XY201AK, R237XY205AK, R237XY215AK, R237XY220AK, R237XY222AK, R237XY223AK, R237XY226AK, and R237XY236AK. These sites typically are differentiated by one or more criteria, including landform, landform position, associated soils, associated disturbance regimes, and the type and amount of plants. Ecotonal plant communities that have characteristics from more than one ecological site are in areas where these sites abut. This is especially noticeable in smaller depressions where species from surrounding sites extend farther into the depressional area.</p>
<p>R237XY223AK</p>	<p>Western Alaska Maritime Graminoid Gravelly Plains, Berms</p> <p>Ecological site R237XY208AK is in organic depressions of plains, mountain valleys, flood plains, and shore complexes. Dominant ecological sites associated with this site include R237XY201AK, R237XY205AK, R237XY215AK, R237XY220AK, R237XY222AK, R237XY223AK, R237XY226AK, and R237XY236AK. These sites typically are differentiated by one or more criteria, including landform, landform position, associated soils, associated disturbance regimes, and the type and amount of plants. Ecotonal plant communities that have characteristics from more than one ecological site are in areas where these sites abut. This is especially noticeable in smaller depressions where species from surrounding sites extend farther into the depressional area.</p>
<p>R237XY201AK</p>	<p>Western Alaska Maritime Scrubland Gravelly Slopes</p> <p>Ecological site R237XY208AK is in organic depressions of plains, mountain valleys, flood plains, and shore complexes. Dominant ecological sites associated with this site include R237XY201AK, R237XY205AK, R237XY215AK, R237XY220AK, R237XY222AK, R237XY223AK, R237XY226AK, and R237XY236AK. These sites typically are differentiated by one or more criteria, including landform, landform position, associated soils, associated disturbance regimes, and the type and amount of plants. Ecotonal plant communities that have characteristics from more than one ecological site are in areas where these sites abut. This is especially noticeable in smaller depressions where species from surrounding sites extend farther into the depressional area.</p>

R237XY205AK	<p>Western Alaska Maritime Scrubland Loamy Swales</p> <p>Ecological site R237XY208AK is in organic depressions of plains, mountain valleys, flood plains, and shore complexes. Dominant ecological sites associated with this site include R237XY201AK, R237XY205AK, R237XY215AK, R237XY220AK, R237XY222AK, R237XY223AK, R237XY226AK, and R237XY236AK. These sites typically are differentiated by one or more criteria, including landform, landform position, associated soils, associated disturbance regimes, and the type and amount of plants. Ecotonal plant communities that have characteristics from more than one ecological site are in areas where these sites abut. This is especially noticeable in smaller depressions where species from surrounding sites extend farther into the depressional area.</p>
R237XY215AK	<p>Western Alaska Maritime Scrubland Loamy Plains</p> <p>Ecological site R237XY208AK is in organic depressions of plains, mountain valleys, flood plains, and shore complexes. Dominant ecological sites associated with this site include R237XY201AK, R237XY205AK, R237XY215AK, R237XY220AK, R237XY222AK, R237XY223AK, R237XY226AK, and R237XY236AK. These sites typically are differentiated by one or more criteria, including landform, landform position, associated soils, associated disturbance regimes, and the type and amount of plants. Ecotonal plant communities that have characteristics from more than one ecological site are in areas where these sites abut. This is especially noticeable in smaller depressions where species from surrounding sites extend farther into the depressional area.</p>
R237XY236AK	<p>Western Alaska Maritime Graminoid Peat Plains</p> <p>Ecological site R237XY208AK is in organic depressions of plains, mountain valleys, flood plains, and shore complexes. Dominant ecological sites associated with this site include R237XY201AK, R237XY205AK, R237XY215AK, R237XY220AK, R237XY222AK, R237XY223AK, R237XY226AK, and R237XY236AK. These sites typically are differentiated by one or more criteria, including landform, landform position, associated soils, associated disturbance regimes, and the type and amount of plants. Ecotonal plant communities that have characteristics from more than one ecological site are in areas where these sites abut. This is especially noticeable in smaller depressions where species from surrounding sites extend farther into the depressional area.</p>

Similar sites

R237XY204AK	<p>Western Alaska Maritime Scrubland Loamy Slopes</p> <p>Ecological site R237XY208AK is unique. Sites R237XY204AK and R237XY224AK also support low and dwarf shrubs and have some plant species that are in site R237XY208AK; however, site R237XY208AK does not support the large communities of lichen common in the reference plant community of sites R237XY204AK and R237XY224AK.</p>
R237XY224AK	<p>Western Alaska Maritime Scrubland Gravelly Plains, Berms</p> <p>Ecological site R237XY208AK is unique. Sites R237XY204AK and R237XY224AK also support low and dwarf shrubs and have some plant species that are in site R237XY208AK; however, site R237XY208AK does not support the large communities of lichen common in the reference plant community of sites R237XY204AK and R237XY224AK.</p>
R237XY226AK	<p>Western Alaska Maritime Grassland Peat Flood Plains, Depression</p> <p>Ecological site R237XY208AK is on landforms similar to those of site R237XY226AK, which is associated with mineral depressions. These ecological sites are differentiated by the shrubs (ericaceous versus willow), graminoids (cottongrasses and bulrushes versus bluejoint), and soils (organic versus mineral).</p>

Figure 1. Some areas of ecological site R237XY208AK are associated with ponds or lakes.

Figure 2. The early ponding community consists dominantly of graminoids.

Table 3. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Vaccinium uliginosum</i> (2) <i>Andromeda polifolia</i>
Herbaceous	(1) <i>Trichophorum</i> (2) <i>Carex</i>

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).

Landform: Flood plains, plains, mountain valleys, shore complexes

Landform position: Depressions

Elevation: 0 to 2,700 feet

Slope: 0 to 3 percent

Slope shape: Concave to linear

Aspect: All aspects

Drainage class: Very poorly drained

Ponding: Mosquitopoint, occasional ponding, and Snakeriver, occasional ponding—occasional, brief; Snakeriver, rare flooding—frequent, long; Ekiligamut—none

Depth to water table: Ekiligamut; Mosquitopoint, occasional ponding; Snakeriver, rare flooding; and Snakeriver, occasional ponding—at the surface in April through September

Flooding: Ekiligamut—very frequent, extremely brief; Snakeriver, rare flooding—rare

Frost-free period: 75 to 140 days

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
Slope shape up-down	(1) Concave (2) Linear

Landforms	(1) Plains > Depression (2) Coastal plain > Depression (3) Mountain valleys or canyons > Depression (4) Plains > Flood plain
Flooding duration	Extremely brief (0.1 to 4 hours)
Flooding frequency	None to very frequent
Ponding duration	Brief (2 to 7 days) to long (7 to 30 days)
Ponding frequency	None to frequent
Elevation	0 – 820 m
Slope	0 %
Aspect	W, NW, N, NE, E, SE, S, SW

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.

Table 5 Representative climatic features

Frost-free period (characteristic range)	80-140 days
Freeze-free period (characteristic range)	
Precipitation total (characteristic range)	

Influencing water features

Soil features

The Ekiligamut soils; Mosquitopoint soils, occasional ponding; Snakeriver soils, rare flooding; and Snakeriver soils, occasional ponding, are correlated to this ecological site. The saturated hydraulic conductivity is high in the organic layer of the soils, and it is moderately high or high in the mineral layer of the Mosquitopoint and Snakeriver soils and moderately high in the marine layer of the Ekiligamut soil. The

upper part of the soils is very strongly acid to slightly acid. The wide range in reaction is a result of the tidal influences on the Ekiligamut soils.

Table 6. Representative soil features

Drainage class	Very poorly drained
----------------	---------------------

Ecological dynamics

Plains, flood plains, mountain valleys, and shore complexes are throughout the Ahklun Mountains area. These landforms support myriad ecological sites distinguished by differences in landform, disturbance regime, soil characteristics, and vegetative communities.

Site R237XY208AK is in organic depressions of flood plains, plains, mountain valleys, and shore complexes. Landform features, soil characteristics, and disturbance regimes create this unique ecological site. The soils are very poorly drained and are suited to obligate and facultative wetland species.

Disturbance Dynamics

Hydrological influences

A seasonal water table resulting from flooding, ponding, and tides is the major influence on the vegetation in this ecological site. Ponding commonly inhibits oxygen to plants (Hook and Crawford, 1978; Jackson et al., 1991). Hypoxic and anoxic conditions are major abiotic stresses that partially determine the presence or absence of vascular plants. Temporal tolerance of oxygen deprivation differs among plant species, so the length of ponding that affects plants ranges from many hours to several weeks (Vartapetian and Jackson, 1996).

The frequency and length of ponding in the depressions varies. Low areas of the depressions are wetter than are the high areas. The low areas typically support community 1.2, and the high areas commonly support community 1.1. Permanently ponded water is in the center of some depression (figs. 1 and 2). Community 1.2 commonly surrounds the water, and community 1.1 makes up an outer ring.

Flooding

Flooding contributes to ponding. The depressions of shore complexes and flood plains can be inundated by freshwater from river flooding and by saltwater from tides and storm surges.

Other Observations

Current data show that regardless of the surrounding landscape, most organic depressions support similar wetland species and communities. Future data may be used to discern and describe separate ecological sites for depressions of different landforms based on characteristics not yet recorded, such as production. In areas of this ecological site on tidal marshes, the addition of brackish floodwater and groundwater may alter the vegetative community. Further monitoring is needed to determine if a unique ecological site is required.

Slight browsing by moose on shrubs and graminoids has been recorded in the reference plant community. This level of browsing does not warrant an early browse sere or 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

- Alaska Climate Research Center. 2017. Climatological data–Bristol Bay. <http://oldclimate.gi.alaska.edu>. Accessed September 19, 2017.
- Gallant, A.I., E.F. Binnian, J.M. Omernik, and M.B. Shasby. 1995. Ecoregions of Alaska. U.S. Geological Survey Professional Paper 1567. Government Printing Office, Washington, D.C.
- Hartmann, B. 2002. Climate regions of Alaska. The Alaska Climate Research Center. <http://oldclimate.gi.alaska.edu/ClimTrends/30year/regions1.html>. Modified August 28, 2002. Accessed September 19, 2017.
- Hook, D., and R.M.M. Crawford. 1978. Plant life in anaerobic environments. Ann Arbor Science Publishers, Ann Arbor, MI.
- Jackson, M.B., D.D. Davies, and H. Lambers (editors). 1991. Plant life under oxygen deprivation: Ecology, physiology, and biochemistry. SPB Academic Publication, The Hague, Netherlands.
- Kautz, D.R., P. Taber, and S. Nield (editors). 2004. Land resource regions and major land resource areas of Alaska. U.S. Department of Agriculture, Natural Resources Conservation Service, Palmer, AK. Revised 2012.
- PRISM Climate Group. 2014. PRISM climate data. Oregon State University. <http://prism.oregonstate.edu>. Accessed March 27, 2018.
- Schoeneberger, P.J., and D.A. Wysocki. 2012. Geomorphic description system. Version 4.2. U.S. Department of Agriculture, Natural Resources Conservation Service, National Soil Survey Center, Lincoln, NE.
- Schoeneberger, P.J., D.A. Wysocki, E.C. Benham, and Soil Survey Staff. 2012. Field book for describing and sampling soils. Version 3.0. U.S. Department of Agriculture, Natural Resources Conservation Service, National Soil Survey Center, Lincoln, NE.
- Soil Science Division Staff. 2017. Soil survey manual. Ditzler, C., K. Scheffe, and H.C Monger, editors. U.S. Department of Agriculture Handbook 18. Government Printing Office, Washington, D.C.
- U.S. Census Bureau. 2016. Vintage 2016 population estimates: Population estimates. <https://www.census.gov>. Accessed August 14, 2017.
- U.S. Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.
- Vartapetian, B.B., and M.B. Jackson. 1996. Plant adaptations to anaerobic stress. *Annals of Botany* 79 (Supplement A): 3-20.
- Viereck, L.A., C.T. Dyrness, A.R. Batten, and K.J. Wezlick. 1992. The Alaska vegetation classification. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station General Technical Report PNW-GTR-286. Portland, OR.
- Western Regional Climate Center. 2017. Climate of Alaska. <http://wrcc.dri.edu>. Accessed September 19, 2017.

Contributors

Kendra Moseley
 Michael Margo
 Stephanie Schmit
 Sue Tester
 Charlotte Crowder

Approval

Michael Margo, 7/23/2020

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	04/22/2026
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:

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:
