

Ecological site R237XY270AK

Boreal Alpine Dwarf Scrub Mountain Summits and Shoulders, Convex

Last updated: 4/13/2021
Accessed: 05/11/2025

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): 237X—Ahklun Mountains

The Ahklun Mountains Major Land Resource Area (MLRA 237) is in western Alaska. 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. 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 whom 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

This proposed ecological concept is correlated to the STATSGO soil component E37-Boreal alpine dwarf scrub-gravelly colluvial slopes. Site R237XY270AK is the basis for the ecological site group ESG19X2237X00X. This ecological site description (ESD) will be revised when field data are collected that can be used to confirm or update the following information.

Hypothesized Reference Plant Community

The reference plant community likely is comprised of dwarf alpine shrubs. A high diversity of graminoid and forb species that have low individual cover also is likely.

Classification Crosswalk (community descriptions of similar landscapes and landforms in other vegetation classification systems)

*LANDFIRE Biophysical Settings: Alaska Arctic Lichen Tundra (7616870) [Alaska Arctic Acidic Sparse Tundra] (USDA et al., 2007)

*Alaska Vegetation Classification system: III.C.2.a (Vioreck et al., 1992)

*Circumboreal Vegetation Mapping (CBVM) Project: South Alaska-Yukon Alpine Dwarf Scrub and Meadows (Jorgensen and Meidinger, 2015)

*Alaska Arctic Tundra Vegetation: B3e.3–Acid Mountain Complex (Raynolds et al., 2006)

*U.S. National Vegetation Classification Database 2.03: G613–Western Boreal Alpine Dwarf-Shrubland Group (USNVC, 2019)

Similar sites

R237XY217AK	Western Alaska Maritime Dwarf Scrubland Gravelly Slopes, High Elevation Sites R237XY217AK and R237XY270AK are on similar landforms in areas of MLRA 237 that have a maritime climate. Field data are required to determine whether these sites have the same communities and natural processes and may be correlated into a single site.
R237XY219AK	Western Alaska Maritime Dwarf Scrubland Gravelly Slopes, Very Steep Sites R237XY219AK and R237XY270AK are on similar landforms in areas of MLRA 237 that have a maritime climate. Field data are required to determine whether these sites have the same communities and natural processes and may be correlated into a single site.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Dryas octopetala</i> (2) <i>Empetrum nigrum</i>
Herbaceous	(1) <i>Anthoxanthum monticola</i> ssp. <i>alpinum</i> (2) <i>Polygonum viviparum</i>

Physiographic features

This ecological site is on high-elevation summits and shoulders of rugged, boreal mountains.

Table 2. Representative physiographic features

Geomorphic position, mountains	(1) Mountaintop
Hillslope profile	(1) Summit (2) Shoulder
Landforms	(1) Mountains > Mountain slope (2) Mountains > Mountain slope
Flooding frequency	None
Ponding frequency	None

Elevation	200–2,300 ft
Slope	25–55%
Aspect	W, NW, N, NE, E, SE, S, SW

Climatic features

Influencing water features

Soil features

This proposed ecological site is correlated to well drained soils. A paralithic contact typically is within a depth of 60 inches.

Table 3. Representative soil features

Drainage class	Well drained
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Ecological dynamics

The reference plant community likely is shrubland comprised of prostrate, dwarf shrubs. Sporadic forbs and graminoids are likely. Factors such as elevation, temperature, soil characteristics, slope, microtopography, and aspect influence the community.

State and transition model

Ecosystem states

1. Reference State

State 1 submodel, plant communities

1.1. Alpine dwarf scrubland

State 1
Reference State

The reference state supports all the communities that are a result of natural disturbances on this landform.

Community 1.1
Alpine dwarf scrubland

This community is influenced by the convex alpine summits and shoulders at high elevations. Extant shrubs likely are prostrate. Small quantities of sporadic graminoids and forbs typically are present.

Resilience management. This community is in a harsh environment. The constant stressors of the disturbances likely result in an early successional sere.

Dominant plant species

- eightpetal mountain-avens (*Dryas octopetala*), shrub
- black crowberry (*Empetrum nigrum*), shrub
- arctic willow (*Salix arctica*), shrub
- skeletonleaf willow (*Salix phlebophylla*), shrub
- draba (*Draba*), shrub
- alpine sweetgrass (*Anthoxanthum monticola* ssp. *alpinum*), grass
- sedge (*Carex*), grass
- fescue (*Festuca*), grass
- arctic lupine (*Lupinus arcticus*), other herbaceous
- saxifrage (*Saxifraga*), other herbaceous
- anemone (*Anemone*), other herbaceous
- alpine bistort (*Polygonum viviparum*), other herbaceous

Additional community tables

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.

Jorgensen, T., and D. Meidinger. 2015. The Alaska-Yukon Region of the circumboreal vegetation map (CBVM). CAFF Strategies Series Report. Conservation of Arctic Flora and Fauna, Akureyri, Iceland. ISBN: 978-9935-431-48-6.

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.

Raynolds, M.K., D.A. Walker, and H.A. Maier. 2006. Alaska arctic tundra vegetation map. Scale 1:4,000,000. Conservation of Arctic Flora and Fauna (CAFF) Map No. 2. U.S. Fish and Wildlife Service, Anchorage, Alaska.

U.S. Census Bureau. 2016. Vintage 2016 population estimates: Population estimates. <https://www.census.gov>. Accessed August 14, 2017.

U.S. Department of Agriculture, Forest Service; U.S. Department of the Interior, Geological Survey; and the Nature Conservancy. LANDFIRE national vegetation dynamics models. January 2007 (last update). <http://landfire.gov>. Accessed December 16, 2019.

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.

U.S. Department of the Interior, Geological Survey. LANDFIRE biophysical settings layer. 2014 (last update). <http://landfire.cr.usgs.gov/viewer>. Accessed December 8, 2019.

U.S. National Vegetation Classification (USNVC). 2019. The U.S. national vegetation classification database, V2.03. Federal Geographic Data Committee, Vegetation Subcommittee, Washington DC. <http://usnvc.org>. Accessed

December 16, 2019.

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

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Approval

Curtis Talbot, 4/13/2021

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	05/11/2025
Approved by	Curtis Talbot
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:**
