Ecological site R237XY260AK
Boreal Alpine Tussock Mountain Summits and Shoulders, Linear

Last updated: 4/13/2021
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. 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 tussock-silty frozen slopes. Site R237XY260AK is the basis for the ecological site group ESG20X2237X00X. 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 This community is tussock scrub. Graminoids include cottongrasses (Eriophorum spp.) and sedges (Carex spp.). Shrub species are in the low and dwarf strata and may be a mix of alpine and nonalpine species. A short growing season, wind exposure, and depth to a root-limiting layer are major vegetative drivers. ----- Classification Crosswalk (community descriptions of similar landscapes and landforms in other vegetation classification systems) *LANDFIRE Biophysical Settings: Western NA Boreal Tussock Tundra (7616290) (USDA et al., 2007) *Alaska Vegetation Classification System: III.A.2.d (Viereck et al., 1992) *Circumboreal Vegetation Mapping (CBVM) Project: South Alaska-Yukon Alpine Dwarf Scrub and Meadows (Jorgensen and Meidinger, 2015) *Alaska Arctic Tundra Vegetation: G4.1–Graminoid tundra (Raynolds et al., 2006) *U.S. National Vegetation Classification Database 2.03: G613–Western Boreal Alpine Dwarf-Shrubland Group (USNVC, 2019)

Table 1. Dominant plant species

Tree	Not specified

Shrub	(1) *Betula nana* (2) *Ledum palustre ssp. decumbens*
Herbaceous	(1) *Eriophorum vaginatum* (2) *Carex bigelowii*

Physiographic features

This ecological site is on linear alpine summits and shoulders of rugged, boreal mountains.

Table 2. Representative physiographic features

Landforms	(1) Mountains > Mountain slope (2) Mountains > Mountain slope
Flooding frequency	None
Ponding duration	Long (7 to 30 days)
Ponding frequency	Frequent
Elevation	60 – 700 m
Slope	0 %
Aspect	W, NW, N, NE, E, SE, S, SW

Climatic features

Influencing water features

Soil features

The soils associated with this site are cold and commonly are subject to shallow seasonal frost late into summer. Permafrost typically is at a depth of 20 to 32 inches. The soils are very poorly drained. Frequent (more than 50 times in 100 years), long (7 to less than 30 days) periods of ponding are thought to occur during the growing season (May and June).

Table 3. Representative soil features

Drainage class	Very poorly drained

Ecological dynamics

The vegetation is influenced by elevation, soil temperature, and soil moisture. This community supports tussock cottongrass with alpine and nonalpine shrubs, forbs, and other graminoids throughout. The areas between the tussocks trap water, which keeps the soils moist and holds water in the system.

The available fuel for fires may be high, but the abiotic factors likely regulate the frequency and severity of fires. Similar communities outside of MLRA 237 do not exhibit a separate post-disturbance community.

State and transition model

Additional community tables

Table 4. Community 1.1 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.l., 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.

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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	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):**

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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:**
