USDA Natural Resources Conservation Service

Ecological site R237XY251AK
Western Alaska Alpine Dwarf Scrubland, Unsorted Circles

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

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 ecological site is correlated to the STATSGO component E-37 maritime scrub-gravelly frozen circles. Site R237XY251AK is the basis for the ecological site group ESG01X2237X00X. 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

Dwarf and low scrub (mix of alpine and low-elevation species) and sedges are throughout. Fruticose and crustose lichen may be prevalent on the unsorted rock. The ground cover is dominantly rock fragments.

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

*LANDFIRE Biophysical Settings: None (USDA et al., 2007)

*Alaska Vegetation Classification System: II.D.2.c (Viereck et al., 1992)

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

*Alaska Arctic Tundra Vegetation: S1.4–Erect dwarf-shrub, lichen communities (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) *Empetrum nigrum* (2) *Dryas integrifolia*
Herbaceous	(1) *Carex*

Physiographic features

This ecological site is defined by unsorted circular microfeatures on some summits and shoulders at high elevations of mountains.

Table 2. Representative physiographic features

Landforms	(1) Mountains > Mountain > Circle
Flooding frequency	None
Ponding frequency	None

Climatic features

Influencing water features

Soil features

The soils associated with this site are gravelly. A seasonal freeze-thaw cycle occurs, which creates unsorted circular microfeatures.

Ecological dynamics

Extant species may include alpine and maritime species. The plants commonly grow prostrate. This community is influenced by environmental stressors such as wind exposure, a short growing season, gravelly soils, and a seasonal freeze-thaw cycle. These stressors do not result in a post-disturbance community distinct from the reference plant community.

State and transition model

Ecosystem states

1. Reference State

State 1 submodel, plant communities

1.1. Alpine and maritime low and dwarf shrubs, sedges, and forbs

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 and maritime low and dwarf shrubs, sedges, and forbs

Unsorted circular microfeatures typically are in cold, high-elevation areas. The vegetation is hypothesized to include a mix of alpine and maritime shrubs, graminoids, and forbs. Plants common in these areas include eightpetal mountain-avens, alpine azalea, black crowberry, sedges, lupine, and anemones.

Resilience management. This community is subject to natural stressors such as a short growing season, gravelly soils, cold temperatures, and exposure to wind. The freeze-thaw processes that create unsorted circular microfeatures also affect the location of individual plants in the community. No early disturbance sere is associated with this ecological site.

Dominant plant species

- eightpetal mountain-avens (*Dryas octopetala*), shrub
- alpine azalea (*Loiseleuria procumbens*), shrub
- black crowberry (*Empetrum nigrum*), shrub
- alpine bearberry (*Arctostaphylos alpina*), shrub
- sedge (*Carex*), grass
- Altai fescue (*Festuca altaica*), grass
- alpine sweetgrass (*Anthoxanthum monticola ssp. alpinum*), grass
- anemone (*Anemone*), other herbaceous
- arctic lupine (*Lupinus arcticus*), other herbaceous

Additional community tables

Other references

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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	05/13/2025
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:**