

Ecological site R237XY256AK

Western Alaska Maritime Tussock-Scrub Mountain Slopes, Hummocked

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 concept is correlated to the STATSGO soil component E37-Maritime tussock-scrub-silty frozen slopes. Site R237XY256AK is the basis for the ecological site group ESG09X2237X00X. 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 a tussock-scrub tundra that has the microfeature of earth hummocks. Facultative or obligate wetland species probably make up a majority of plant cover.

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

*LANDFIRE Biophysical Settings: Western North American Boreal Tussock Tundra (USDA et al., 2007)

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

*Circumboreal Vegetation Mapping (CBVM) Project: Central-Northern Alaska-Yukon Alpine D Scrub and Meadows (not best fit) (Jorgensen and Meidinger, 2015)

*Alaska Arctic Tundra Vegetation: G4.1–Graminoid tundra (Raynolds et al., 2006)

*U.S. National Vegetation Classification Database 2.03: G617–North American Arctic Wet Meadow Group (USNVC, 2019)

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Vaccinium</i> (2) <i>Ledum palustre</i> ssp. <i>decumbens</i>
Herbaceous	(1) <i>Eriophorum vaginatum</i> (2) <i>Carex bigelowii</i>

Physiographic features

This ecological site is on slopes of rounded mountains that have a microfeature of earth hummocks.

Table 2. Representative physiographic features

Landforms	(1) Mountains > Mountain slope > Earth hummock
Ponding duration	Long (7 to 30 days)
Ponding frequency	Frequent
Elevation	15–1,128 m
Slope	0–12%
Aspect	W, NW, N, NE, E, SE, S, SW

Climatic features

Influencing water features

Soil features

This ecological site is associated with very poorly drained soils that are highly susceptible to frost heave. Permafrost typically is at a depth of 24 inches. Frequent (more than 50 times in 100 years), long (7 to less than 30 days) periods of ponding are thought to occur in May and June.

Table 3. Representative soil features

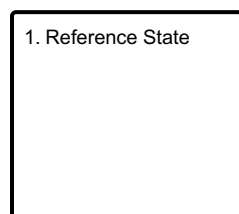
Drainage class	Very poorly drained
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Ecological dynamics

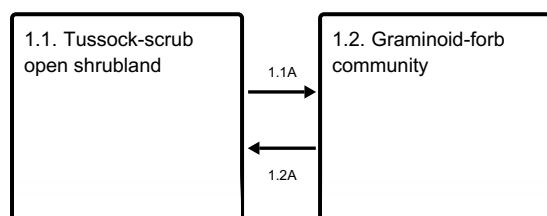
Hydrology, seasonal frost, permafrost, and frost heave are major drivers of the vegetation in this site. Hydrophytic vegetation, including tussocked graminoids and other facultative or obligate wetland species, normally are present.

State and transition model

Ecosystem states



State 1 submodel, plant communities



1.1A - Fire.

1.2A - Fire recovery.

State 1 Reference State

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

Community 1.1 Tussock-scrub open shrubland

This community likely is a mix of tussock-forming graminoids and shrubs. Areas between the tussocks may be wet throughout the growing season. It is unknown if the earth hummocks result in different communities in the microhigh and microlow positions.

Dominant plant species

- marsh Labrador tea (*Ledum palustre* ssp. *decumbens*), shrub
- dwarf birch (*Betula nana*), shrub
- bog blueberry (*Vaccinium uliginosum*), shrub
- cottongrass (*Eriophorum*), grass
- sedge (*Carex*), grass

Community 1.2 Graminoid-forb community

The composition of the post-fire community depends on a variety of factors, including the intensity and patchiness of fire, available seed sources, and survival rate of extant species. Intense fires may lower or remove permafrost from the soil, which could drastically change the vegetative community. The post-fire community commonly supports a variety of fast-growing graminoids and forbs.

Dominant plant species

- cottongrass (*Eriophorum*), grass
- sedge (*Carex*), grass
- fireweed (*Chamerion angustifolium*), other herbaceous

Pathway 1.1A

Community 1.1 to 1.2

Fire.

Pathway 1.2A

Community 1.2 to 1.1

Fire recovery.

Additional community tables

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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:**
