

Ecological site F237XY263AK Boreal Woodland Mountain Drainageway

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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 site concept is correlated to the STATSGO soil component E37-Boreal scrub-silty frozen drainageways. Site F237XY263AK is the basis for the ecological site group ESG24X2237X00X. 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 proposed reference plant community for this ecological site is a mixed open forest or woodland comprised of one or more tree species, including white spruce, black spruce, paper birch, Kenai birch, and quaking aspen. The understory likely consists of facultative or obligate wetland shrubs, forbs, and graminoids.

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

*Similar ecological site in AK637 (Togiak National Wildlife Refuge): None

*LANDFIRE Biophysical Settings: Western NA Boreal Mesic Scrub Birch-Willow Shrubland-Boreal (best fit, but not ideal) (USDA et al., 2007)

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

*Circumboreal Vegetation Mapping (CBVM) Project: Southern Alaska Spruce-Birch-Herb Forests (Jorgensen and Meidinger, 2015)

*Alaska Arctic Tundra Vegetation: None (Raynolds et al., 2006)

*U.S. National Vegetation Classification Database 2.03: G546–Alaskan-Yukon Boreal Black Spruce Wet Forest Group (best fit) (USNVC, 2019)

Table 1. Dominant plant species

Tree	(1) <i>Picea glauca</i> (2) <i>Betula</i>
Shrub	(1) <i>Salix</i>
Herbaceous	(1) <i>Calamagrostis canadensis</i>

Physiographic features

This proposed ecological site is in drainageways of boreal mountains.

Table 2. Representative physiographic features

Landforms	(1) Mountains > Drainageway
Elevation	61–701 m
Slope	0–2%
Aspect	W, NW, N, NE, E, SE, S, SW

Climatic features

Influencing water features

Soil features

This proposed ecological site is associated with very poorly drained soils. Permafrost typically is at a depth of 40 to 60 inches. The potential for frost action is high. Flooding and ponding is thought to occur throughout the growing season (May through September). Frequent, long periods of flooding and ponding occur in May and June, and frequent, brief periods occur in July through September. Rare periods of flooding occur in October through April.

Table 3. Representative soil features

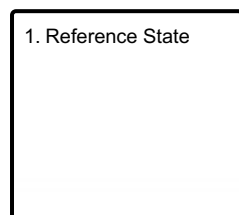
Drainage class	Very poorly drained
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Ecological dynamics

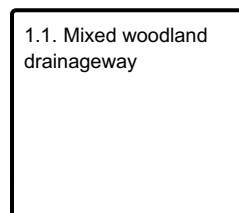
The plant community is influenced by factors such as slope, elevation, aspect, and soil characteristics. Trees likely are present, possibly including a mix of deciduous and coniferous species. The understory probably consists of species common in drainageways, including willow, alder, ferns, graminoids, and forbs.

State and transition model

Ecosystem states



State 1 submodel, plant communities



State 1 Reference State

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

Community 1.1 Mixed woodland drainageway

The community in the boreal drainageways likely depends on local environmental factors. This woodland community may support a single tree species, but it more likely supports a mix of spruce and one or more hardwood species. The understory likely is dominantly medium to tall shrubs, commonly willow, and low, dense graminoids and forbs.

Dominant plant species

- black spruce (*Picea mariana*), tree
- white spruce (*Picea glauca*), tree
- paper birch (*Betula papyrifera*), tree
- Kenai birch (*Betula papyrifera* var. *kenaica*), tree
- willow (*Salix*), shrub
- alder (*Alnus*), shrub
- bluejoint (*Calamagrostis canadensis*), grass
- sedge (*Carex*), grass
- spreading woodfern (*Dryopteris expansa*), other herbaceous
- horsetail (*Equisetum*), other herbaceous
- woolly geranium (*Geranium erianthum*), other herbaceous
- arctic sweet coltsfoot (*Petasites frigidus*), other herbaceous
- claspleaf twistedstalk (*Streptopus amplexifolius*), 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:**
