USDA Natural Resources Conservation Service

Ecological site F237XY265AK
Boreal Subalpine Woodland on Slopes of Rugged Mountains

Last updated: 4/13/2021
Accessed: 05/09/2024

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 component E37-Boreal subalpine woodland-loamy colluvial slopes. Site F237XY265AK is part of the basis for the ecological site group ESG18X2237X00X. 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 white spruce woodland that has open areas of low and dwarf scrub species such as crowberry, marsh Labrador tea, and bog blueberry. The trees may be krummholz. Alpine species, such as eightpetal mountain avens and alpine azalea, likely are present. Highly diverse, sporadic forbs and graminoids that have low cover likely are present.

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

*Similar ecological sites in AK637 (Togiak National WIldlife Refuge): None. No white spruce woodland is mapped in the AK637 project. This ecological site may be correlated to a boreal ecological site from a neighboring MLRA, such as 230 or 238.

*LANDFIRE Biophysical Settings: Western NA Boreal Treeline White Spruce Woodland–Sub-boreal (7616001) (USDA et al., 2007)

*Alaska Vegetation Classification System: I.A.3.c (Viereck et al., 1992)

*Circumboreal Vegetation Mapping (CBVM) Project: South Alaska Subalpine Spruce Woodlands & Scrub (Jorgensen and Meidinger, 2015)

*Alaska Arctic Tundra Vegetation: No Arctic AK Geobotany community fits (Raynolds et al., 2006)

*U.S. National Vegetation Classification Database 2.03: G579–Central Alaskan-Yukon Boreal Mesic Forest Group (USNVC, 2019)

Similar sites

F237XY259AK	**Boreal Subalpine Woodland on Slopes of Rounded Mountains** Ecological sites F237XY259AK and F237XY265AK are correlated to the ecological site group ESG18X2237X00X. Field documentation is required to determine if these sites should remain separate or be correlated into a single site.

Table 1. Dominant plant species

Tree	(1) *Picea glauca*
Shrub	(1) *Betula nana* (2) *Vaccinium vitis-idaea*
Herbaceous	Not specified

Physiographic features

This ecological site is on linear to concave backslopes and footslopes of rugged mountains.

Table 2. Representative physiographic features

Hillslope profile	(1) Footslope (2) Backslope
Landforms	(1) Mountains > Mountain slope

Climatic features

Influencing water features

Soil features

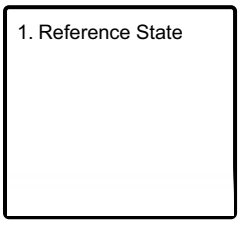
The soils typically are derived from loamy colluvium.

Ecological dynamics

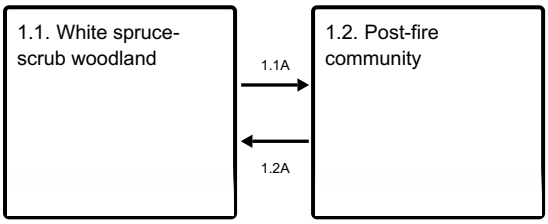
These subalpine mountain slopes support white spruce woodland that has low and dwarf shrubs in the understory. Local abiotic factors, such as elevation, slope, and aspect, influence the community. Fire is expected to occur on this site, but the low fuel load at the higher elevations may result in low-severity fires and a long interval between fires (USDA et al., 2007).

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 white spruce woodland on the loamy colluvial slopes in subalpine boreal areas. The reference state supports all the communities that are a result of natural disturbances on the landform.

Characteristics and indicators. The characteristics of the reference state community are influenced by the short growing season, cold climate, and exposure to wind.

Community 1.1
White spruce-scrub woodland

This community is dominantly white spruce woodland, but it may be an open forest in more protected areas. The white spruce trees in exposed areas probably are krummholz. The understory likely is a mix of boreal and subalpine low and dwarf shrubs and a low cover of highly diverse forbs and graminoids.

Dominant plant species

- white spruce (*Picea glauca*), tree
- black crowberry (*Empetrum nigrum*), shrub
- dwarf birch (*Betula nana*), shrub
- marsh Labrador tea (*Ledum palustre ssp. decumbens*), shrub
- lingonberry (*Vaccinium vitis-idaea*), shrub
- eightpetal mountain-avens (*Dryas octopetala*), shrub

- sedge (*Carex*), grass
- reedgrass (*Calamagrostis*), grass

Community 1.2
Post-fire community

The post-fire community depends on the severity of fires. Due to the relatively low fuel load, low-severity burns are likely. These burns normally leave pockets of unburned vegetation that provide the seed source for post-disturbance vegetation. The post-fire community likely includes a mix of extant shrubs and fast-growing forbs and graminoids.

Dominant plant species

- marsh Labrador tea (*Ledum palustre ssp. decumbens*), shrub
- black crowberry (*Empetrum nigrum*), shrub
- dwarf birch (*Betula nana*), shrub
- lingonberry (*Vaccinium vitis-idaea*), shrub
- reedgrass (*Calamagrostis*), grass
- fescue (*Festuca*), 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

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	05/09/2024
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:**

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3. **Number and height of erosional pedestals or terracettes:**

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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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):**

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:**