Ecological site R237XY230AK
Western Alaska Maritime Scrubland Silty Plains and Mountain Slopes, Lower

Last updated: 7/23/2020
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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 (fig. 2). 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 (fig. 3). 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 which 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

Ecological site R237XY230AK is on lower mountain slopes and talfs of plains. The soils associated with this site are moderately well drained. Landform, location, slope shape, and soil characteristics differentiate this ecological site. The reference state supports one plant community, which is the reference plant community. No alternate states are in this ecological site.

The reference plant community is a closed tall scrubland (Viereck et al., 1992). This community consists dominantly of Sitka alder (*Alnus viridis* ssp. sinuata). The understory consists of shade-tolerant forbs and graminoids, including ferns and bluejoint (*Calamagrostis canadensis*).

Associated sites

R237XY202AK	**Western Alaska Maritime Mosaic Gravelly Slopes**
R237XY204AK	**Western Alaska Maritime Scrubland Loamy Slopes**
R237XY208AK	**Western Alaska Maritime Scrubland Peat Depressions**
R237XY211AK	**Western Alaska Maritime Scrubland Loamy Flood Plains**
R237XY217AK	**Western Alaska Maritime Dwarf Scrubland Gravelly Slopes, High Elevation**
R237XY201AK	**Western Alaska Maritime Scrubland Gravelly Slopes** Site R237XY230AK is on lower mountain slopes and plains. The most common associated ecological sites on or adjacent to these landforms are R237XY201AK, R237XY202AK, R237XY204AK, R237XY208AK, R237XY211AK, and R237XY217AK. These ecological sites typically are differentiated by one or more criteria, including landform, landform position, associated soils, associated disturbance regimes, and the type and amount of plants. Ecotonal plant communities that have characteristics from more than one ecological site are in areas where these sites abut.

Similar sites

R237XY202AK	**Western Alaska Maritime Mosaic Gravelly Slopes** Site R237XY202AK supports a reference community of alder, ferns, and bluejoint similar to that of site R237XY230AK. However, site R237XY202AK is associated with well drained soils, is on backslopes of mountains, and supports a unique mosaic of two communities. These differences require the use of separate ecological sites.
R237XY203AK	**Western Alaska Maritime Scrubland Gravelly Drainage, Escarpment** The reference plant community of site R237XY230AK is similar to that of site R237XY203AK; however, these sites are on different landforms, support different overstory and understory vegetation, and are associated with different soils. These differences require the use of separate ecological sites.

Figure 1. Alders are dominant in the plant community. Shade-tolerant forbs and graminoids typically are in the dense understory.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Alnus viridis subsp. sinuata*
Herbaceous	(1) *Dryopteris expansa* (2) *Calamagrostis canadensis*

Physiographic features

Site characteristics specifically relate to the reference plant community phase. Each ecological site has a specific set of site characteristics and disturbance dynamics that results in a unique plant community composition, structure, and function. Site characteristics (climate, geology, topography, and soil characteristics) are dynamic across a landscape. Subtle changes in site characteristics can result in a different plant community phase or ecological site. Definitions of site characteristics are provided in the United States Department of Agriculture Handbook 296 (USDA-NRCS, 2006), Geomorphic Description System (Schoeneberger and Wysocki, 2012), Field Book for Describing and Sampling Soils (Schoeneberger et al., 2012), and Soil Survey Manual (Soil Science Division Staff, 2017).

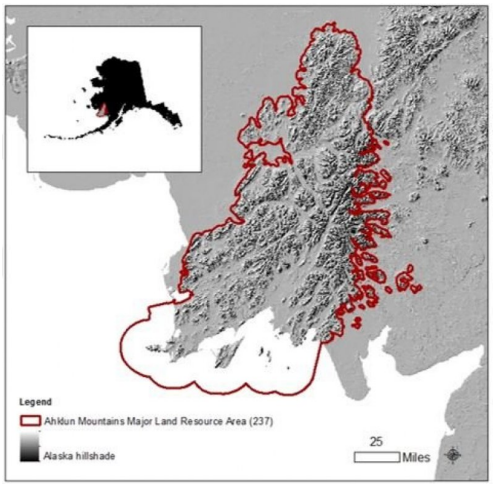

Figure 2. The Ahklun Mountains area (MLRA 237) is in western Alaska.

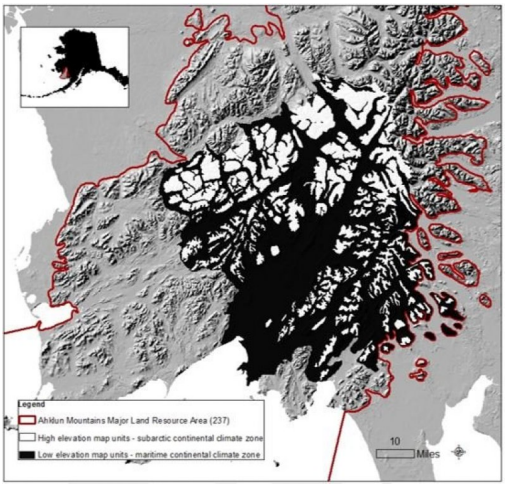

Figure 3. High-elevation and low-elevation map units in the area, which illustrate the primary climatic influence.

Table 2. Representative physiographic features

Geomorphic position, mountains	(1) Lower third of mountainflank
Geomorphic position, flats	(1) Talf
Slope shape across	(1) Linear
Slope shape up-down	(1) Concave (2) Linear
Landforms	(1) Mountains > Mountain slope (2) Plains > Plain
Flooding frequency	None
Ponding frequency	None
Elevation	30–1,000 ft

Slope	9–30%
Water table depth	2–28 in
Aspect	W, NW, N, NE, E, SE, S, SW

Climatic features

Climate of land resource region (LLR): Maritime continental (Western Regional Climate Center, 2017); short, warm summers and long, cold winters (USDA-NRCS, 2006)

Climate of major land resource area (MLRA): Maritime continental in the lowlands and subarctic continental at higher elevations. The mean annual precipitation is 20 to 30 inches in the lowlands, and it increases to more than 45 inches at the higher elevations. The mean annual air temperature along the coast is about 34 degrees F (1 degree C) (PRISM, 2014). Strong winds are common throughout the year.

Table 3. Representative climatic features

Frost-free period (characteristic range)	80-140 days
Freeze-free period (characteristic range)	
Precipitation total (characteristic range)	

Influencing water features

Hydrological Influences

Precipitation and snowmelt in these concave areas can result in runoff and a shallow water table, particularly during snowmelt in spring. The reference plant community is tolerant of these conditions, and no evidence exists that these disturbances surpass the resilience threshold required to create a distinct early community phase. The slope gradient prevents ponding.

Soil features

The moderately well drained Mitlak soil is correlated to this ecological site. The saturated hydraulic conductivity of the soil is moderately high or high throughout. Variations in pH throughout the profile correspond to differences in parent material and organic matter content. The glacial underlying material has little, if any, organic material and is moderately acid to neutral. The cambic horizon formed by podzolization is very strongly acid to moderately acid, and the upper part of the soil generally is extremely acid. Organic acids produced by the litter of alder leaves mobilize iron and aluminum released during the weathering of minerals.

Table 4. Representative soil features

Drainage class	Moderately well drained

Ecological dynamics

Overview

Site R237XY230AK is on lower mountain slopes and talfs of plains adjacent to rises. This ecological site was identified primarily in the southeastern part of the Ahklun Mountains area. No known major disturbance occurs in this site. The slopes generally are not steep enough to be subject to landslides.

Alder is suspected to be the community driver on these landforms (figs. 1 and 5). Alder is an important colonizer in Alaska (Talbot et al., 2005). It thrives in nutrient-poor soils, fixes nitrogen, and is supported by a shallow root system. These factors make it an excellent competitor for space and light. The soil correlated to this ecological site is moderately well drained, and the upper part is extremely acid, which is typical under alder vegetation (Miles, 1985) and affects the plants in the understory.

Disturbance Dynamics

No known disturbance regime in this ecological site results in an early community phase. Anthropogenic disturbances that remove vegetation, such as construction of trails, may promote disturbances such as erosion that can alter the reference plant community and result in a unique plant community. Natural variations in plant richness and cover have been observed among areas of this ecological site.

Hydrological Influences
Precipitation and snowmelt in these concave areas can result in runoff and a shallow water table, particularly during snowmelt in spring. The reference plant community is tolerant of these conditions, and no evidence exists that these disturbances surpass the resilience threshold required to create a distinct early community phase. The slope gradient prevents ponding.

Fire
No incidence or evidence of fire was recorded in situ for this ecological site; however, previous wildfires have been mapped in areas of the site. Historically, the major causes of wildfires in the Ahklun Mountains area are lightning strikes and human activity (AICC, 2017).

Other Observations
Browsing or grazing was not observed in this ecological site.

No alternate states are in this ecological site.

State and transition model

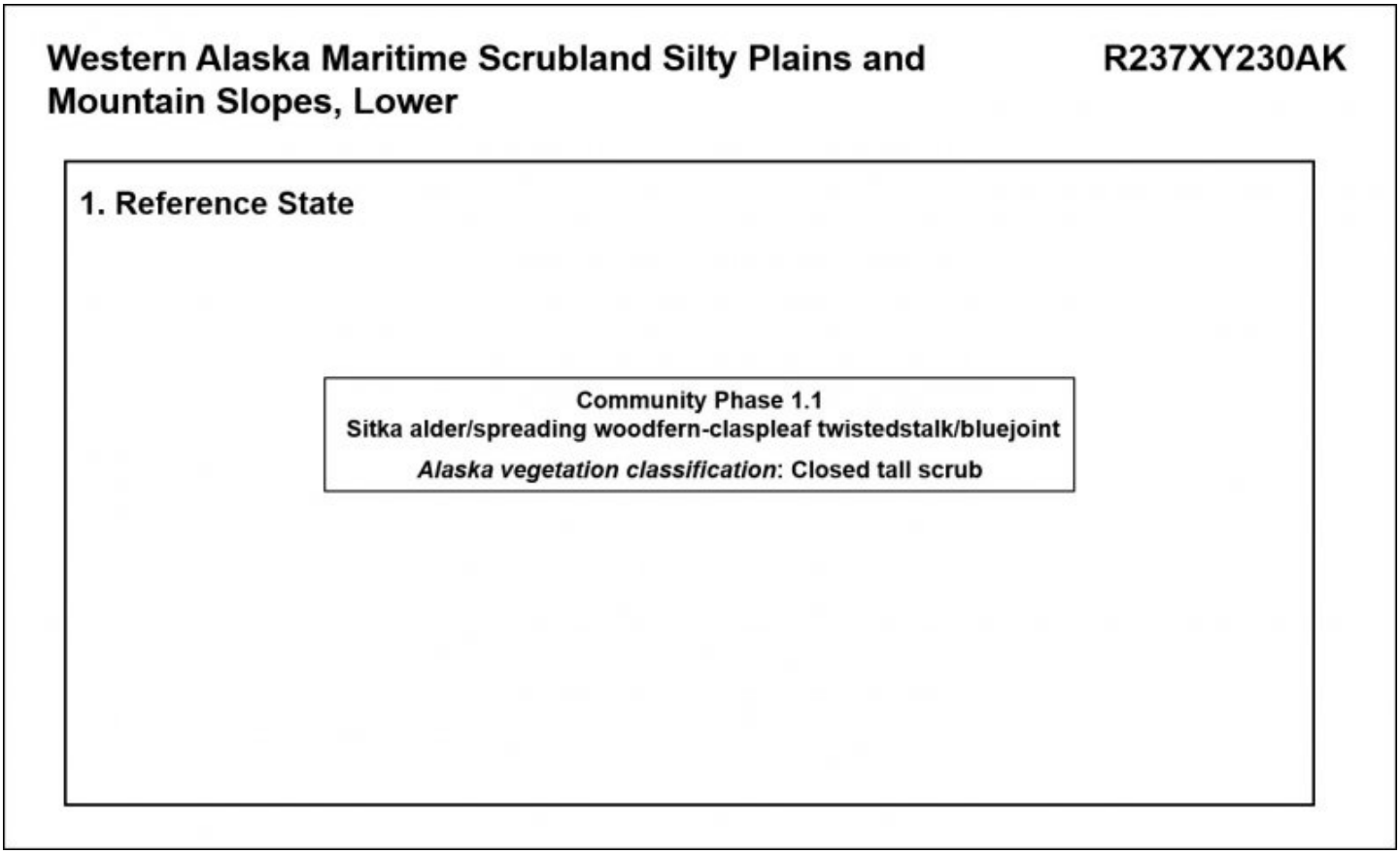

Figure 4. State-and-transition model.

State 1
Reference State

The reference state supports one community phase that is distinguished by the developed structure and dominance of the vegetation and the ecological function and stability of the community (fig. 4). The reference community phase

is a tall closed scrubland. Shade-tolerant forbs and graminoids are in the understory. This report provides baseline vegetation inventory data. Future data collection is needed to provide further information about existing plant communities. Common and scientific names are from the USDA PLANTS database. All community phases are characterized by the Alaska Vegetation Classification System (Viereck et al., 1992).

Community 1.1
Sitka alder/spreading woodfern-claspleaf twistedstalk/bluejoint (Alnus viridis ssp. sinuata/Dryopteris expansa-Streptopus amplexifolius/Calamagrostis canadensis)

Figure 5. Typical area of the reference plant community.

Community Phase 1.1 Canopy Cover Table

Vegetation data are aggregated across modal sample plots for this community phase and are provided as a frequency (percent) and mean canopy cover (percent) of the dominant and most ecologically relevant species. Canopy cover is represented as a mean with the range in parentheses.

Plant group	Common name	Scientific name	USDA plant code	Frequency (percent)	Mean canopy cover (percent)
S	Sitka alder	*Alnus viridis* ssp. *sinuata*	ALVIS	100	80 (75-85)
G	Bluejoint	*Calamagrostis canadensis*	CACA4	100	30 (4-60)
F	Spreading woodfern	*Dryopteris expansa*	DREX2	100	60 (35-90)
F	Claspleaf twistedstalk	*Streptopus amplexifolius*	STAM2	100	1 (0.1-2)
F	Green false hellebore	*Veratrum viride*	VEVI	67	1 (0-1)
F	Common ladyfern	*Athyrium filix-femina*	ATFI	33	2 (0-5)

This dataset includes data from three sample plots. The plots are distributed across the Ahklun Mountains area and are independent of one another. Due to the limited data available for this plant community phase, personal field observations were used to aid in describing the community.

Plant functional group classifications—T = trees, S = shrubs, G = graminoids, F = forbs, B = bryophytes, L = lichens

Canopy cover data are based on ocular estimates and rounded, except trace (0.1 percent) cover. Data ranging from 1 to 9 percent cover are rounded to the nearest integer. Data ranging from 10 to 100 percent cover are rounded to the nearest factor of 5.

Figure 6. Canopy cover and frequency of species in community 1.1.

The reference plant community is characterized as closed tall scrub (fig. 5) (Viereck et al., 1992). The major vegetative strata are tall forbs (more than 2 feet in height), tall graminoids (more than 2 feet), and tall shrubs (more than 10 feet) (fig. 6). The plant community typically consists of dense Sitka alder and an understory of spreading woodfern (*Dryopteris expansa*), claspleaf twistedstalk (*Streptopus amplexifolius*), and bluejoint. Other shade-tolerant forbs and graminoids may be present, including common ladyfern (*Athyrium filix-femina*), green false hellebore (*Veratrum viride*), and arctic starflower (*Trientalis europaea*). The ground cover commonly is herbaceous and woody litter and moss.

Additional community tables

Other references

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Approval

Michael Margo, 7/23/2020

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	05/10/2025
Approved by	Michael Margo
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):

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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:**
