Ecological site F237XY216AK
Boreal Woodland Loamy Flood Plains

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 F237XY216AK is on mid to high flood plains of the Izavieknik River valley. The climate, landform, and location create a unique ecological site along this river. The river valley is in the eastern part of the Ahklun Mountains area, and it is prone to the pressure of tree propagule from neighboring MLRA 236. Poplar trees, more common in areas of milder climates to the east, are now a keystone plant species in this river valley. The reference state supports one documented community phase.

The reference plant community is an open broadleaf forest (Viereck et al., 1992) of balsam poplar (Populus balsamifera) and an understory of shrubs, graminoids, and forbs. Understory plants include willow (Salix spp.), squashberry (Viburnum edule), bluejoint (Calamagrostis canadensis), field horsetail (Equisetum arvense), and a mix of less prevalent graminoids and forbs.

Associated sites

R237XY210AK	**Western Alaska Maritime Scrubland Gravelly Flood Plains** Ecological site F237XY216AK is differentiated from the associated ecological sites based on position on the landscape, landform, disturbance regime, and vegetative communities. Ecotonal plant communities that have characteristics of more than one ecological site are in areas where these sites abut.
R237XY211AK	**Western Alaska Maritime Scrubland Loamy Flood Plains** Ecological site F237XY216AK is differentiated from the associated ecological sites based on position on the landscape, landform, disturbance regime, and vegetative communities. Ecotonal plant communities that have characteristics of more than one ecological site are in areas where these sites abut.
R237XY222AK	**Western Alaska Maritime Scrubland Loamy Hummocks** Ecological site F237XY216AK is differentiated from the associated ecological sites based on position on the landscape, landform, disturbance regime, and vegetative communities. Ecotonal plant communities that have characteristics of more than one ecological site are in areas where these sites abut.

Similar sites

F237XY239AK	**Boreal Forest Loamy Slopes** Four ecological sites are on major flood plains in the Ahklun Mountains area. Three of these sites are throughout the area. Site F237XY216AK, however, is restricted to the valley carved by the Izavieknik River (fig. 1). Location, flooding characteristics, and soil features create a unique vegetative community in this ecological site. Site F237XY239AK is a balsam poplar community, but it is associated with discharge slopes, such as fans or seeps, that behave differently than flood plains. The understory vegetation of site F237XY216AK is different from that of site F237XY216AK.

Figure 1. Mid to high flood plains along the Izavieknik River support open balsam poplar forests.

Table 1. Dominant plant species

Tree	(1) *Populus balsamifera*
Shrub	(1) *Viburnum edule*
Herbaceous	(1) *Equisetum arvense* (2) *Athyrium filix-femina*

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).

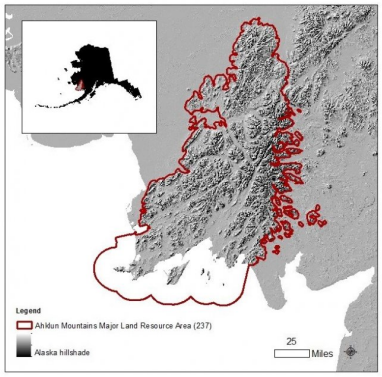

Figure 2. The Ahklun Mountains area (MLRA 237) is in western Alaska.

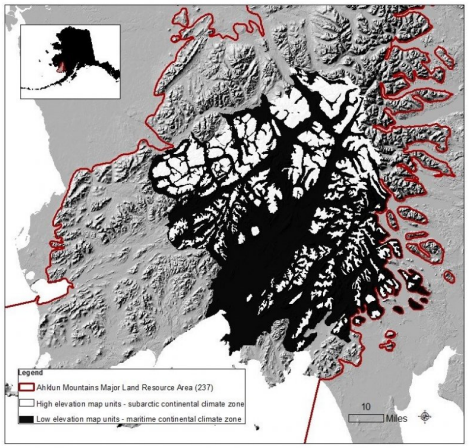

Figure 3. High-elevation and low-elevation map units in the area, which illustrate the primary climatic influence.

Table 2. Representative physiographic features

Slope shape across	(1) Convex (2) Linear
Slope shape up-down	(1) Linear
Geomorphic position, flats	(1) Talf
Landforms	(1) River valley > Flood plain
Flooding frequency	Rare

Ponding frequency	None
Elevation	210–560 ft
Slope	0–3%
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). Strong winds are common throughout the year.

Table 3. Representative climatic features

Frost-free period (characteristic range)	80-135 days
Freeze-free period (characteristic range)	
Precipitation total (characteristic range)	

Influencing water features

Soil features

This ecological site is correlated to Typic Cryofluvents, rarely flooded. These soils are well drained. The saturated hydraulic conductivity of the soils is moderately low or moderately high to a depth of 20 inches and very high below that depth.

Table 4. Representative soil features

Drainage class	Well drained

Ecological dynamics

Overview

Site F237XY216AK is on mid and high flood plains in the Izavieknik River valley. The ideal sandy or gravelly soils preferred by poplar commonly are on flood plains and in river valleys (Viereck and Little, 2007). The Izavieknik River is near the eastern edge of MLRA 237, where it abuts MLRA 236 (Bristol Bay—Northern Alaska Peninsula Lowlands). This

area was carved by glaciers during the Pleistocene, creating mountain valleys along an east/west trajectory. The valleys create the winding, interlocking border between the MLRAs (figs. 2 and 3). It is believed that these valley corridors allowed for the western movement of balsam poplar to MLRA 237 via windblown seed.

F237XY216AK supports a forest community along the Izavieknik River. It currently is unknown if other flood plains in this MLRA support the ideal climate, landform, and soils to support this ecological site. If the ideal conditions are elsewhere, increased propagule pressure generated by this ecological site likely will be a major factor in the spread of balsam poplar to new areas.

Disturbance Dynamics

Disturbances resulting in community phases or state transitions were not observed. The limited data collected for this ecological site did not include any from areas that had undergone a recent disturbance. Further data collection is needed to determine the presence of a post-disturbance community sere.

Flooding

Flooding is the primary disturbance on this ecological site. Flooding can create barren, moist areas ideal for colonization. Floods also bury organic layers, add nutrients to the soils, deposit seed banks, and decrease competition for light and space (Rood et al., 2007; Yarie et al., 1998). Typically, the intensity and frequency of flooding affects the distribution and abundance of vegetation in Alaska riverine systems (Wohl, 2007). The average frequency of flooding on this ecological site is rare (1 to 5 times in 100 years). No evidence indicates that this disturbance creates an early community phase on these flood plains.

Other Observations

Terraces that intersect these flood plains typically support a dense willow community. An ecotonal community of dense willow and medium and regenerating balsam poplar is in areas where these landforms abut.

Browsing by moose on willow has been documented in the reference plant community. Moose also likely browse the early sere, although it was not observed in situ. Browsing in the reference plant community typically is slight. No early browse sere is required for this ecological site.

No alternative states are associated with this ecological site.

State and transition model

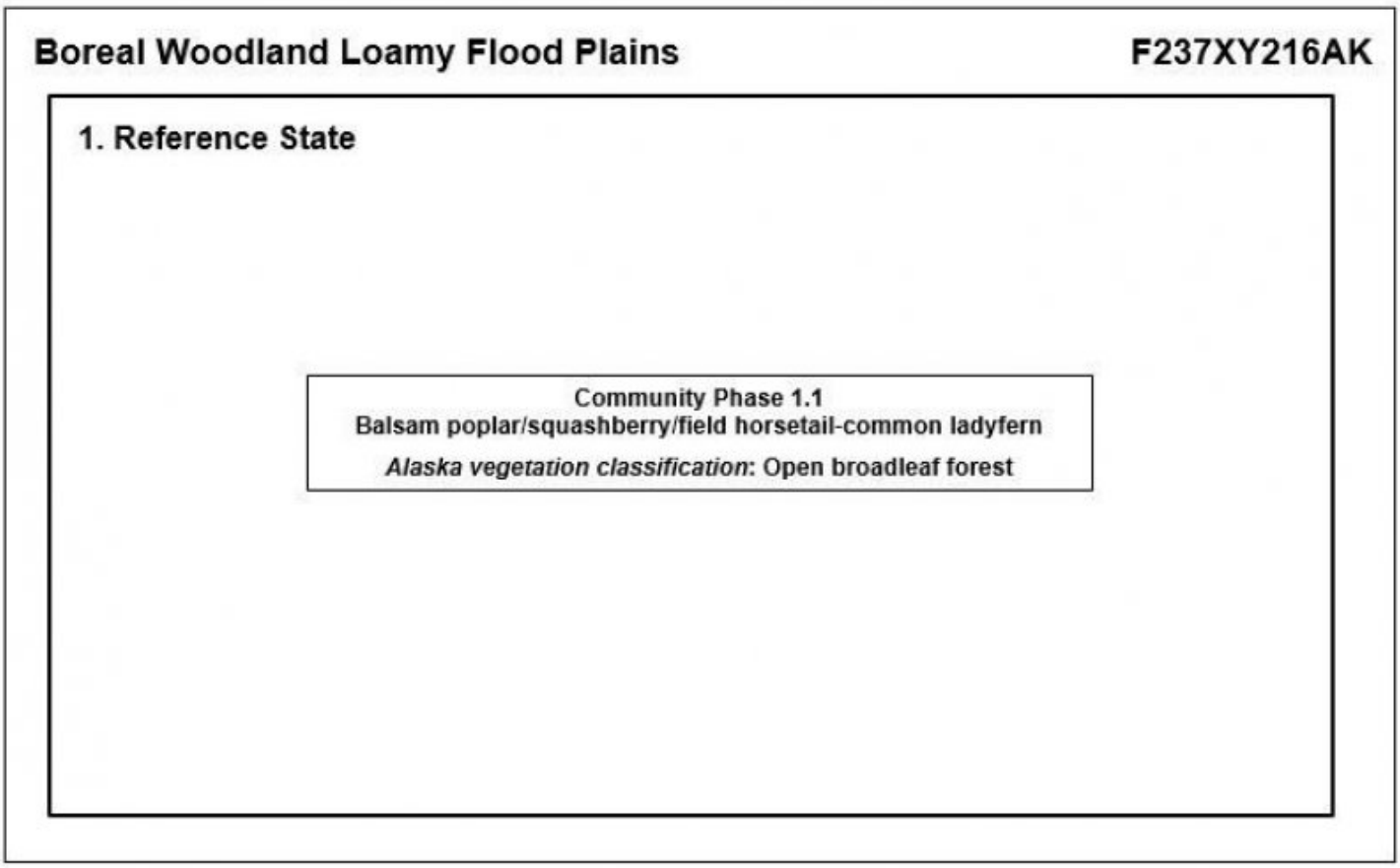

Figure 4. State-and-transition model.

State 1
Reference State

The reference state supports one community phase that is distinguished by developed structure and dominance of the vegetation and the ecological function and stability of the community (fig. 4). The reference community phase consists of an overstory of deciduous trees and an understory of shrubs, forbs, and graminoids. This report provides baseline data for vegetation inventory. Future data collection is needed to provide further information about the existing plant community and the potential for disturbances to create early community phases. Common and scientific names are from the USDA PLANTS database. Community phases are characterized by the Alaska Vegetation Classification System (Viereck et al., 1992).

Community 1.1
Balsam poplar/squashberry/field horsetail-common ladyfern

Figure 5. Typical area of plant community 1.1.

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)
T	Balsam poplar	*Populus balsamifera*	POBA2	100	35 (20-55)
S	Squashberry	*Viburnum edule*	VIED	100	25 (10-50)
S	Willow^	*Salix spp.*	SALIX	75	6 (0-20)
G	Bluejoint	*Calamagrostis canadensis*	CACA4	100	25 (2-45)
F	Field horsetail	*Equisetum arvense*	EQAR	100	20 (5-65)
F	Common ladyfern	*Athyrium filix-femina*	ATFI	75	10 (0.1-25)
F	Fireweed	*Chamerion angustifolium*	CHAN9	75	6 (0-20)
F	Common cowparsnip	*Heracleum maximum*	HEMA80	75	4 (0-10)
F	Liverleaf wintergreen	*Pyrola asarifolia*	PYAS	75	3 (0-10)
F	Claspleaf twistedstalk	*Streptopus amplexifolius*	STAM2	75	3 (0-7)
F	Spreading woodfern	*Dryopteris expansa*	DREX2	50	3 (0-8)
F	Fewflower meadow-rue	*Thalictrum sparsiflorum*	THSP	50	2 (0-8)

^Willow (*Salix spp.*) includes all willow species.

This dataset includes data from four sample plots. The sample plots are distributed across the Ahklun Mountains area and are independent of one another.

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.

Values for tall, medium, and stunted tree strata are used to calculate mean canopy cover and range. Regenerative trees are not included in the calculations.

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

The reference plant community is characterized as an open broadleaf forest (Viereck et al., 1992) that has an understory of shrubs, forbs, and graminoids (fig. 5). Medium forbs (4 to 24 inches in height), tall trees (more than 40 feet), tall forbs (more than 24 inches), and tall shrubs (more than 10 feet) are the main vegetative strata. The canopy is comprised of balsam poplar (fig. 6). Understory species commonly include squashberry, one or more species of willow, field horsetail, common ladyfern (*Athyrium filix-femina*), and bluejoint. The ground cover typically includes herbaceous and woody litter and ground mosses. Some areas are bare soil.

Additional community tables

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Contributors

Sue Tester
Kendra Moseley
Michael Margo
Stephanie Schmit
Charlotte Crowder

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	05/21/2025
Approved by	Michael Margo
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

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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):**

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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:**
