Ecological site F236XY115AK
Boreal Forest Loamy Moist Slopes

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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): 236X–Bristol Bay-Northern Alaska Peninsula Lowlands

MLRA 236 is in southwest Alaska. It covers 19,575 square miles (USDA–NRCS, 2006) and extends inland from Bristol Bay. It is composed primarily of level to rolling plains and low to moderate hills bordered by long footslopes of mountains (Kautz et al., 2012). The flood plains and terraces along the major rivers and lakes are characterized by depressions and small basins. Mountains form the eastern and western borders of the MLRA, and glacially formed lakes are behind terminal moraines (Kautz et al., 2012). The entire MLRA was covered by glacial ice during the early to middle Pleistocene (USDA–NRCS, 2006). The climate near the coast is dominantly maritime, and the continental climate further inland is influenced by weather systems of Interior Alaska (Kautz et al., 2012). Summers typically are warm and short, and winters are long and cold. The average annual precipitation is 13 to 50 inches, and the average annual air temperature is 30 to 36 degrees F (Kautz et al., 2012). The freeze-free period normally is 70 to 125 days. Aspect and elevation, which ranges from sea level to about 2,500 feet above sea level (USDA–NRCS, 2006), influence the climate and weather patterns. This MLRA is sparsely populated. The major communities include Dillingham, Naknek, and King Salmon. Federally managed land in the MLRA includes parts of Katmai National Park and Preserve and the Aniakchak National Monument and Preserve as well as Togiak and Alaska Peninsula National Wildlife Refuges (Kautz et al., 2012; USDA–NRCS, 2006).

Ecological site concept

This ecological site is on upland plains and hills. Site elevation ranges sea level to 920 feet. Slopes are nearly level to gentle (0 – 8 percent). Vegetation is supported on weakly developed soils that have increased fertility due to volcanic ash. Fire and windthrow create different communities in the reference state. There are two human-caused alternate states. The reference state supports three communities. The reference plant community is characterized as a mixed open forest (Viereck et al., 1992). It is composed of a white spruce and paper birch in the canopy with an understory of shade-tolerant shrubs, forbs and graminoids.

Associated sites

F236XY157AK	**Boreal Woodland Moist Loamy Plains** These sites adjoin each other on the same slopes. Soils are poorly drained and cooler on the nearly level, less steep slopes of F236XY157AK. The vegetation is shaped by these soil conditions and differentiate the veg on those slopes compared to the ones described by F236XY115AK.
F236XY116AK	**Boreal Forest Loamy Wet Slopes** Both sites are on plains and hills. F236XY116AK describes similar sites that are adjacent to wetlands. Wetland hydrology influences the site characteristics, disturbances, and supported vegetation, creating an ecological site distinct from F236XY115AK.

Similar sites

F236XY157AK	**Boreal Woodland Moist Loamy Plains** Both sites support a forest community on plains and hillslopes. These sites can be differentiated by over and understory composition driven by differences in soil characteristics. F237XY157AK is associated with poorly drained and cooler soils.

Table 1. Dominant plant species

Tree	(1) *Picea glauca* (2) *Betula papyrifera*
Shrub	(1) *Spiraea stevenii* (2) *Rubus pedatus*
Herbaceous	(1) *Dryopteris expansa* (2) *Calamagrostis canadensis*

Physiographic features

This site is on linear slopes of plains and hill sideslopes. Elevation ranges from sea level to 920 feet. Slopes are primarily nearly level to gentle (0 – 8 percent), though they range up to 35 percent. Flooding and ponding are absent, and run-off is typically negligible to medium. This site is found at all aspects.

Table 2. Representative physiographic features

Geomorphic position, flats	(1) Talf (2) Rise
Geomorphic position, hills	(1) Side Slope
Landforms	(1) Plains > Plain (2) Hills > Hill (3) Plains > Rise
Runoff class	Negligible to medium
Flooding frequency	None
Ponding frequency	None
Elevation	0 − 280 m
Slope	0 − 10 %

Water table depth	Not specified
Aspect	W, NW, N, NE, E, SE, S, SW

Table 3. Representative physiographic features (actual ranges)

Runoff class	Negligible to high
Flooding frequency	None
Ponding frequency	None
Elevation	0 – 300 m
Slope	0 – 40 %
Water table depth	0 – 180 cm

Climatic features

The climate of this site reflects that of the MLRA, which is described as maritime polar (EPA, 2013). Temperatures are moderated by the nearby Bristol Bay and norther Pacific bodies of water. Annual precipitation ranges from 21 – 34 inches with approximately 40 percent occurring during the June-September growing season (PRISM, 2018).

Table 4 Representative climatic features

Frost-free period (characteristic range)	80-100 days
Freeze-free period (characteristic range)	70-90 days
Precipitation total (characteristic range)	530-860 mm
Frost-free period (actual range)	80-100 days
Freeze-free period (actual range)	70-90 days
Precipitation total (actual range)	380-1,040 mm
Frost-free period (average)	90 days
Freeze-free period (average)	80 days

Precipitation total (average)	740 mm

Influencing water features

Due to its landscape position, this site is not influenced by wetland or riparian water features. Precipitation is the main source of water.

Soil features

Soils are acidic Spodosols (Soil Survey Staff, 2013). They are very deep and well drained with moderate permeability. Soils support a cryic temperature regime and an udic moisture regime. Parent material is comprised of volcanic ash and/or loess.

Soil development and fertility affect vegetation on this site. Soil development is typically minimal, as evident by an ochric epipedon and cambic horizon. Vegetation on soils with these characteristics is typically restricted to fast-growing herbaceous species and nitrogen-fixing plants such as legumes and alder. On this site, the dense reference plant forest community may be the partial result of increased soil fertility due to volcanic ash in the soil resulting in andic soil properties in the rooting zone.

Correlated soil components in MLRA 236: Aleknagik, Ciimaq, Duney, Kanakanak, Typic Haplocryods, E36-Boreal forest and woodland-silty till slopes, E36-Boreal forest-gravelly colluvial slopes

Table 5. Representative soil features

Parent material	(1) Loess (2) Volcanic ash
Surface texture	(1) Highly organic silt loam (2) Medial silt loam (3) Highly organic silt
Drainage class	Well drained
Permeability class	Moderate
Soil depth	150 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-25.4cm)	3.81 – 6.35 cm
Soil reaction (1:1 water) (0-25.4cm)	3.4 – 10

Subsurface fragment volume <=3" (Depth not specified)	0 – 20 %
Subsurface fragment volume >3" (Depth not specified)	0 – 10 %

Table 6. Representative soil features (actual values)

Drainage class	Well drained
Permeability class	Moderate
Soil depth	150 cm
Surface fragment cover <=3"	0 %
Surface fragment cover >3"	0 %
Available water capacity (0-25.4cm)	3.81 – 7.87 cm
Soil reaction (1:1 water) (0-25.4cm)	3.4 – 10
Subsurface fragment volume <=3" (Depth not specified)	0 – 50 %
Subsurface fragment volume >3" (Depth not specified)	0 – 10 %

Ecological dynamics

This boreal site is on upland linear to convex plain and hill slopes. Local site factors, including soil characteristics and disturbances create three vegetative communities. The reference plant community is a mixed birch and white spruce forest. It is unlikely that this site experiences long periods without disturbance which would otherwise support a white spruce forest.

Fires are a documented disturbance on this site. Fire frequency and intensity are unknown for this site. It is suspected that fires transform the reference plant community to an open meadow, before transitioning to a shrubland and finally returning to a forest.. Fires are typically suppressed around human settlements, so this disturbance is more common in remote areas.

Windthrow occurs on this site. It opens up the canopy, creating open pockets in the forest where understory competition flourishes. These areas support a dense mix of herbaceous and shrub species until once again becoming overshadowed by trees. Willows are browsed by

moose. This does not appear to affect the ecological processes of the site.

Two human-created alternative states are present on this site. The first alternate state is in cleared areas in and around villages and towns experience a shift in the plant community. These areas may have been cleared for previous agricultural or cultural purposes, but are no longer managed. It is suspected that disturbances to the soil and existing seedbank create a unique post-disturbance phase. This evolves into a deciduous forest with lower abundances of vascular and non-vascular plants in the understory. A second alternate state is the result of forestry activities. Harvesting of trees for building material and fires results in different plant communities.

The information in this Ecological Dynamics section, including the state-and-transition model (STM), was developed based on current field data, professional experience, and a review of the scientific literature. As a result, all possible scenarios or plant species may not be included. Key indicator plant species, disturbances, and ecological processes are described to inform land management decisions.

State and transition model

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 8. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 9. Community 1.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 10. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 11. Community 2.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 12. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 13. Community 3.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Inventory data references

Modal points for Community 1.1 07SS11704 07SS12405 11SS02602 07CS12806 Modal points for community 1.2 07SS05306 07MM01102 Modal point for Community 1.3 None Modal point for Community 2.1 07DM21007 10SS00304 Modal point for Community 2.2 07CS18602 07SS11906 08SS15403 Modal point for Community 3.1 08LL10509 08SS16208 11SS00704 Modal point for Community 3.2 07MM21102 08SS14602 11SS00801

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Other references

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Approval

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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	09/23/2026
Approved by	
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:**
