

Ecological site F236XY157AK

Boreal Woodland Moist Loamy Plains

Last updated: 2/13/2024
Accessed: 09/30/2026

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

The Bristol Bay-Northern Alaska Peninsula Lowland Major Land Resource Area (MLRA 236) is located in Western Alaska. This MLRA covers approximately 19,500 square miles and is defined by an expanse of nearly level to rolling lowlands, uplands and low to moderate hills bordered by long, mountain footslopes. Major rivers include the Egegik, Mulchatna, Naknek, Nushagak, and Wood River. MLRA 236 is in the zone of discontinuous permafrost. It is primarily in areas with finer textured soils on terraces, rolling uplands and footslopes. This MLRA was glaciated during the early to middle Pleistocene. Moraine and glaciofluvial deposits cover around sixty percent of the MLRA. Alluvium and coastal deposits make up a large portion of the remaining area (Kautz et al., 2012; USDA, 2006). Climate patterns across this MLRA shift as one moves away from the coast. A maritime climate is prominent along the coast, while continental weather, commonly associated with Interior Alaska, is more influential inland. Across the MLRA, summers are general short and warm while winters are long and cold. Mean annual precipitation is 13 to 50 inches, with increased precipitation at higher elevations and areas away from the coast. Mean annual temperatures is between 30 and 36 degrees F (USDA, 2006). The Bristol Bay-Northern Alaska Peninsula MLRA is principally undeveloped wilderness. Federally managed land includes parts of the Katmai and Aniakchak National Parks, and the Alaska Peninsula, Becharof, Togiak and Alaska Maritime National Wildlife Refuges. The MLRA is sparsely populated. Principal communities include Dillingham, Naknek, and King Salmon. Commercial fishing in Bristol Bay and the Bering Sea comprises a major part of economic activity in the MLRA. Other land uses include subsistence activities (fishing, hunting, and gathering) and sport hunting and fishing (USDA, 2006).

Ecological site concept

This boreal ecological site is on convex to linear slopes on drift plain talfs, comprised of mineral materials transported by glacier. Site elevation is 20 to 920 feet above sea level. Slopes are nearly level to gentle (0 – 5 percent). Soil hydrology, fertility, and a fire regime shape the vegetation on this site. A deep water table likely discourages recruitment of upland species. Soil development is weak, negatives affecting plant recruitment and growth. The reference state supports three communities. The reference plant community is characterized as a white spruce woodland (Viereck et al., 1992). It is composed of a white spruce canopy with an open understory of ericaceous shrubs, grasses, mosses and lichens. Two early communities are the result of a fire cycle comprised of often low-intensity burns.

Associated sites

R236XY109AK	Subarctic Low Scrub Peat Drainages R236XY109AK described organic depressions on drift plains. These are features on the plains described by this site.
F236XY115AK	Boreal Forest Loamy Moist Slopes F236XY115AK describes rises on drift plains. Rises have soils that do not support a water table, have aquic soil conditions or undergo cryoturbation. This differs from the soil associated with F236XY157AK and results in different vegetative communities.

Similar sites

F236XY115AK	Boreal Forest Loamy Moist Slopes Both sites are on drift plains. F236XY115AK is on rises, which are drier than the talf positions of this site. Site and soil conditions create a woodland in this site and a forest on F236XY115AK.
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Table 1. Dominant plant species

Tree	(1) <i>Picea glauca</i>
Shrub	(1) <i>Betula nana</i> (2) <i>Empetrum nigrum</i>
Herbaceous	Not specified

Physiographic features

This site is on linear to convex slopes of drift plain talfs. Elevation ranges from 20 to 920 feet above sea level. Slopes are nearly level to gentle (0 – 5 percent). This site is found at all aspects. Ponding and flooding do not typically occur. A deep (39 – 59 inches) water table is present year-round.

Table 2. Representative physiographic features

Geomorphic position, flats	(1) Talf
Landforms	(1) Plains > Plain
Runoff class	Negligible to low
Flooding frequency	None
Ponding duration	Very brief (4 to 48 hours)
Ponding frequency	None
Elevation	10 – 280 m
Slope	0 – 10 %
Water table depth	100 – 150 cm
Aspect	W, NW, N, NE, E, SE, S, SW

Table 3. Representative physiographic features (actual ranges)

Runoff class	Negligible to low
Flooding frequency	None
Ponding duration	Very brief (4 to 48 hours)
Ponding frequency	None to rare
Elevation	0 – 300 m
Slope	0 – 10 %
Water table depth	30 – 150 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 northern 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 and through flow are the main sources of water on this site.

Soil features

Soils are young and weakly developed Inceptisols (Soil Survey Staff, 2013). They are very deep and well drained. They support a cryic temperature regime and an udic moisture regime. Parent material is volcanic ash over loess and/or drift.

Soil characteristics affecting vegetation?include hydrology, development and fertility. A deep water table is present between 39 and 59 inches throughout the year. This is too deep to favor obligate wetland species, but likely discourages recruitment of upland species. Soil development affects plant recruitment and growth. Recruitment and growth are likely slow on weakly developed soils like this one, evidenced by an ochric epipedon and a cambic horizon. However, the presence of volcanic ash and andic soil properties likely increase soil fertility, increasing growth rates and recruitment possibilities. Further information is needed to determine the roles that soil development and fertility play on the vegetation on this site.

Correlated soil components in MLRA 236: D36-Boreal woodland loamy eolian slopes, moist; Okstukuk

Table 5. Representative soil features

Parent material	(1) Loess (2) Drift
Surface texture	(1) Silt loam (2) Highly organic silt loam
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)	4.06 – 6.35 cm
Soil reaction (1:1 water) (0-25.4cm)	3.6 – 5.7
Subsurface fragment volume <=3" (Depth not specified)	Not specified

Subsurface fragment volume >3" (Depth not specified)	Not specified
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Table 6. Representative soil features (actual values)

Drainage class	Moderately well drained to 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)	4.06 – 6.35 cm
Soil reaction (1:1 water) (0-25.4cm)	3.6 – 5.7
Subsurface fragment volume <=3" (Depth not specified)	0 %
Subsurface fragment volume >3" (Depth not specified)	0 %

Ecological dynamics

This site is on linear to convex slopes of drift plain talfs. Local site factors such as hydrology, soil factors and fire support three communities on this site. The reference plant community is a white spruce woodland.

Vegetation reflects the underlying soil. A deep water table and aquic soil conditions are present throughout the year. This is too deep to favor obligate wetland species, but likely discourages recruitment of upland species. It also likely limits the growth of white spruce, preventing a forest from developing. Wet soils also can mitigate the effects of fire. Volcanic ash and andic soil properties likely increase soil fertility beyond typical weakly developed soils with an ochric epipedon and a cambic horizon.

Fire is the major documented disturbance regime on this site. Fire is natural and typically is unmanaged. High-intensity and low-intensity fires affect the recovery of vegetation differently. The severity of a burn generally refers to the proportion of the surface organic mat and tree canopy consumed during a fire (Chapin et al., 2006). Fires in cooler and moister habitats tend to result in low-intensity burns, which is typical for this ecological site. A low intensity burn will result in a community similar to that of the reference plant community (1.1). High intensity burns occur less frequently. These fires burn the organic layer and kill most of the plant life. The post-fire community after an intense fire is very different from the reference plant community. The fire cycle is expected to be around 100 years on this site, based on tree ages and depth to charcoal in the soil.

Windthrow may contribute to keeping the forest canopy open and promoting plant diversity in the understory. Willows are slightly to moderately browsed by moose. This does not appear to affect the ecological processes of the site.

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 (%)
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Table 8. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 1.3 plant community composition

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

Modal points for Community 1.1 07AO00402 07AO02202 10TD14102 10TD11501 10TD11502 07SS03603 Modal points for community 1.2 10TD11503 Modal points for community 1.3 07AO002501 07AO002502

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Approval

Kirt Walstad, 2/13/2024

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	09/30/2026
Approved by	
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:
