

Ecological site R236XY153AK

Boreal Willow Silty Low Flood Plains

Last updated: 2/13/2024
Accessed: 10/05/2026

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 site is on lowland flood plain talfs. Site elevation ranges from 20 to 810 feet above sea level. Slopes are nearly level (0 – 3 percent). Soil and site hydrology and the effects of flooding and ponding shape the vegetation on this landform. Soils have little to no development. This site floods frequently and supports a water table at the start of the growing season, significantly restricting the vegetation supported here. The reference state supports three communities. The reference plant community is characterized as a closed tall scrubland (Viereck et al., 1992). It is composed of one or more willow species with an understory of hydrophytic graminoids and forbs. The other communities of this site can co-occur with the reference plant community. These communities are associated with wetter areas where vegetation is further restricted to facultative wet to obligate herbaceous species. The most heavily ponded areas typically only support emergent, herbaceous wetland species.

Associated sites

F236XY111AK	Boreal Forest Loamy Flood Plains F236XY111AK describes rarely flooded high flood plains that support a forest in the reference plant community. They are located higher on the flood plain than the flood plain described here. Differences in elevation, flooding disturbance, and soil characteristics result in different supported vegetation.
R236XY121AK	Boreal Tall Scrub Loamy Flood Plains Both sites are on flood plains and can be found in the same riverine system. R236XY121AK describes low flood plains that are well drained and occasionally flooded. Differences in soil characteristics and flooding disturbance results in different vegetation in the reference states.

Similar sites

R236XY121AK	Boreal Tall Scrub Loamy Flood Plains Both sites are on flood plains. R236XY121AK describes low flood plains that are well drained and occasionally flooded. This site frequently floods and supports a water table at the start of the growing season, significantly restricting the vegetation supported here.
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Salix alaxensis</i> (2) <i>Salix pulchra</i>
Herbaceous	(1) <i>Calamagrostis canadensis</i> (2) <i>Comarum palustre</i>

Physiographic features

This site is on flood plain talfs. Elevation ranges from 20 to 810 feet above sea level. Slopes are nearly level (0 – 3 percent). Flooding is frequent and brief. There is a water table between 9 and 45 inches throughout the growing season. The reference plant community does not pond. Ponding is restricted to lower-lying areas, where it is a brief (community 1.2) to long (community 1.3), occasional event. This site is found at all aspects.

Table 2. Representative physiographic features

Geomorphic position, flats	(1) Talf
Landforms	(1) Valley > Flood plain (2) Alluvial plain > Flood plain
Runoff class	Negligible to low
Flooding duration	Brief (2 to 7 days)
Flooding frequency	Frequent
Ponding duration	Not specified
Ponding frequency	None
Elevation	10 – 250 m
Slope	0 %

Water table depth	20 – 110 cm
Aspect	W, NW, N, NE, E, SE, S, SW

Table 3. Representative physiographic features (actual ranges)

Runoff class	Negligible to low
Flooding duration	Brief (2 to 7 days)
Flooding frequency	Frequent
Ponding duration	Brief (2 to 7 days) to long (7 to 30 days)
Ponding frequency	None to occasional
Elevation	0 – 510 m
Slope	0 %
Water table depth	0 – 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

This site is influenced by riparian water features. Precipitation and seasonal snow melt on the site and run off from nearby slopes are the main sources of water.

Soil features

Soils are Entisols with little to no development (Soil Survey Staff, 2013). They are very deep and moderately well drained. They support a cryic temperature regime. Parent material is comprised of alluvium.

Soil characteristics affecting vegetation?include soil hydrology and?development. Soil development is limited due to the frequent flooding of this site, causing deposition and erosion occur to quickly for soil horizons to develop (Soil Survey Staff, 2013). The condition of the soil at a particular site is reflected in the type, variety and amount of plant species found there. A water table is present at the beginning of the growing season. This restricts the vegetation that can grow here during the important early growing season months.

Correlated soil components in MLRA 236: Nunachuak; D36-Boreal scrub gravelly flood plains, low; D36-Boreal scrub loamy flood plains, wet; E36-Maritime scrub-gravelly low flood plains; E36-Maritime scrub-loamy low flood plains

Table 5. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Very fine sandy loam
Drainage class	Moderately well drained
Permeability class	Moderate to moderately rapid
Soil depth	150 cm
Surface fragment cover <=3"	10 %
Surface fragment cover >3"	Not specified
Available water capacity (0-25.4cm)	3.05 – 4.57 cm

Soil reaction (1:1 water) (0-25.4cm)	5.7 – 6.1
Subsurface fragment volume <=3" (Depth not specified)	10 – 60 %
Subsurface fragment volume >3" (Depth not specified)	Not specified

Table 6. Representative soil features (actual values)

Drainage class	Very poorly drained to moderately well drained
Permeability class	Slow to moderately rapid
Soil depth	150 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	0 – 10 %
Available water capacity (0-25.4cm)	1.27 – 9.65 cm
Soil reaction (1:1 water) (0-25.4cm)	4.6 – 7.6
Subsurface fragment volume <=3" (Depth not specified)	0 – 60 %
Subsurface fragment volume >3" (Depth not specified)	0 – 20 %

Ecological dynamics

This site is on lowland flood plain talfs. Local site factors, including microtopographic elevation, soil characteristics, and flooding and ponding effects support three vegetative communities. The reference plant community is a closed willow scrubland

Spatial and temporal patterns in soil and site hydrology create three flood plain communities. A shallow water table is present at the beginning of the growing season, restricting plants to facultative to obligate wetland species on these flood plains. Frequent flooding

deposits sediment which are reflected in the minimally developed soil horizons. In these wet, normal conditions, a scrubland of hydrophytic willows will develop. In wetter areas, vegetation is further restricted to facultative wet to obligate herbaceous species. These wetter areas coincide with areas supporting a shallow water table further through the growing season and with lower areas of the flood plain that occasionally pond.

Changes in hydrology can shift one community to the other. Increased flooding frequency may restrict slower growing shrubs from sustaining a community. Increased hydrological effects, such as a raised water table due to increased system precipitation, can also shift vegetation away from a shrubland and towards a grassland or meadow.

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 09AO12101 09SS11804 09SS15009 10TD11201 Modal points for community 1.2 08MM13206 08LL09604 Modal points for community 1.3 08MM10402 08LL07407

References

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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	10/05/2026
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:
