

Ecological site R236XY175AK

Subarctic Scrub Loamy Steep Coastal Bluffs

Last updated: 2/13/2024
Accessed: 11/01/2026

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 ecological site is on coastal bluffs. Site elevation is between 10 and 150 feet above sea level. Slopes are steep to very steep (40 – 70 percent). Soil hydrology and lack of development, slope gradient and a erosion disturbance regime shape the vegetation on this landform. The reference state supports two communities. The reference plant community is characterized as a closed, tall scrubland (Vioreck et al., 1992). It is composed of a mix of alder and willow in the overstory with bluejoint and fern in the understory. Landslides and slope sloughing result in bare ground. Fast growing graminoid and herbaceous species colonize these sites and create a mixed meadow (community 1.2)

Associated sites

R236XY124AK	Subarctic Tall Scrub Loamy Convex Hillslopes R236XY124AK describes convex slopes on coastal hills and plains. These landforms are terminated along the coast by the bluffs described by R236XY175AK.
R236XY136AK	Subarctic Low Scrub Loamy Plain Drainages F236XY136AK described drainageways on coastal plains. These drainageways bisects the bluffs described by R1236XY175AK.

Similar sites

R236XY174AK	<p>Subarctic Mosaic Loamy Steep Bluffs</p> <p>Both sites describe steep landforms subject to erosion. R236XY174AK is found in drainages and along river escarpments. Site characteristics, including climate and erosional pressures, are different between those locations and the coastal bluffs described by R236XY175AK.</p>
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Table 1. Dominant plant species

Tree	Not specified
Shrub	<p>(1) <i>Alnus viridis subsp. sinuata</i></p> <p>(2) <i>Salix pulchra</i></p>
Herbaceous	<p>(1) <i>Dryopteris expansa</i></p> <p>(2) <i>Calamagrostis canadensis</i></p>

Physiographic features

This site is on coastal bluffs. Elevation ranges from 10 to 150 feet above sea level. Slopes are steep to very steep (40 to 70 percent). This site is found at all aspects. Flooding and ponding do not occur. A shallow water table (8 to 17 inches) is present in June.

Table 2. Representative physiographic features

Slope shape up-down	<p>(1) Linear</p> <p>(2) Convex</p>
Slope shape across	(1) Linear
Landforms	(1) Lowland > Bluff
Runoff class	High
Flooding frequency	None
Ponding frequency	None
Elevation	0 – 50 m
Slope	40 – 70 %
Water table depth	20 – 40 cm
Aspect	W, NW, N, NE, E, SE, S, SW

Table 3. Representative physiographic features (actual ranges)

Runoff class	High
Flooding frequency	None
Ponding frequency	None
Elevation	0 – 50 m
Slope	40 – 70 %
Water table depth	20 – 40 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 run off are the main sources of water.

Soil features

Soils are young and weakly developed Inceptisols (Soil Survey Staff, 2013). Soils are very deep and poorly drained. They support a cryic temperature regime and an aquic moisture regime. Parent material is organic material over coarse-silty colluvium over gravelly till.

Soil characteristics affecting vegetation include soil hydrology and lack of development. This poorly drained soil supports a water table in June and aquic conditions between 8 and 72 inches. Soil wetness is reflected in the plant community, which is comprised of facultative and facultative wet wetland species. Only the steep slopes (40 – 70 percent) prevent this soil from supporting obligate wetland species. The steep slope, subject to erosion, combined with weakly developed soil, as evidenced by an ochric epipedon, are the ideal site conditions for an alder community.

Correlated soil components in MLRA 236: Flounder

Table 5. Representative soil features

Parent material	(1) Till
Surface texture	(1) Highly organic silt loam
Drainage class	Poorly 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)	5.59 – 6.6 cm
Soil reaction (1:1 water) (0-25.4cm)	4.1 – 5.1
Subsurface fragment volume <=3" (Depth not specified)	30 %
Subsurface fragment volume >3" (Depth not specified)	Not specified

Table 6. Representative soil features (actual values)

Drainage class	Poorly drained
Permeability class	Moderate
Soil depth	150 cm
Surface fragment cover <=3"	0 %
Surface fragment cover >3"	0 %
Available water capacity (0-25.4cm)	5.59 – 6.6 cm
Soil reaction (1:1 water) (0-25.4cm)	4.1 – 5.1
Subsurface fragment volume <=3" (Depth not specified)	30 %
Subsurface fragment volume >3" (Depth not specified)	0 %

Ecological dynamics

This site is on coastal escarpments. Local site factors, including slope steepness, minimally developed, aquic soil and an erosion disturbance support two communities on this site. The reference plant community is a tall, closed scrubland (Viereck et al., 1992). The mix of weakly developed, rocky soil along with aquic soil conditions results in a mixed canopy of alder and willow.

Erosion is responsible for a unique post-disturbance community. Landslides and slope sloughing result in bare ground. Fast growing graminoid and herbaceous species colonize these sites and create a mixed meadow.

Willows are slightly browsed by moose. This does not 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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Inventory data references

Modal points for Community 1.1 07CS15705 07CS16203 07CS17107 Modal points for community 1.2 10SS02007

References

Viereck, L.A., C. T. Dyrness, A. R. Batten, and K. J. Wenzlick. 1992. The Alaska vegetation classification. U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station General Technical Report PNW-GTR-286..

Other references

Kautz, D.R., P. Taber, and S. Nield, editors. 2012. Land Resource Regions and Major Land Resource Areas of Alaska. United States Department of Agriculture, Natural Resources Conservation Service (USDA–NRCS).

PRISM Climate Group. (PRISM) Oregon State University. <https://prism.oregonstate.edu>. Date created October 2018. Accessed 3 Mar 2023.

Scenarios Network for Alaska and Arctic Planning (SNAP).? Historical Monthly Temperature – 1km, 1901-2009. <http://ckan.snap.uaf.edu/dataset/>. Accessed 20 Mar 2023.

Scenarios Network for Alaska and Arctic Planning (SNAP).? Historical monthly and derived precipitation products downscaled from CRU TS data via the delta methods – 2km, 1901-2009.? <http://ckan.snap.uaf.edu/dataset/>. Accessed 20 Mar 2023.

Soil Survey Staff. 2013. Simplified Guide to Soil Taxonomy. USDA-Natural Resources Conservation Service, National Soil Survey Center, Lincoln, NE.

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.

US Environmental Protection Agency (EPA). Level III Ecoregions of the Conterminous United States. UP ESP Office of Research and Development. Corvallis, OR. <http://edg.epa.gov/>. Created 16 Apr 2013. Accessed 20 Mar 2023.

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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)	
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Contact for lead author	
Date	11/01/2026
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:
