

Ecological site R236XY124AK

Subarctic Tall Scrub Loamy Convex Hillslopes

Last updated: 2/13/2024
Accessed: 09/29/2026

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 linear and convex slopes of rolling plains and hill shoulders. Site elevation is between 70 and 1,980 feet above sea level. Slopes range from nearly level to very steep (0 – 42 percent). low soil fertility, soil acidity, and an erosional disturbance regime shape the vegetation in the reference state. The reference state supports two communities. The reference plant community is characterized as a closed tall scrubland (Viereck et al., 1992). It is composed of an alder canopy with bluejoint and spreading woodfern in the understory. There is an alternate state associated with human disturbance.

Associated sites

F236XY115AK	Boreal Forest Loamy Moist Slopes F236XY115AK describes mixed forests on rounded mountain backslopes. These areas are downslope of the alder-bearing hill shoulders described by this site.
F236XY171AK	Subarctic Woodland Loamy Slopes F236XY171AK describes forested plains. These areas are downslope of the hill shoulder positions described by this ecological site. Differences in soil characteristics and disturbance regimes are main drivers in shaping the vegetation on these sites.

R236XY132AK	Subarctic Dwarf Scrub Dry Loamy Slopes Both sites are found on hill shoulders. R236XY132AK describes low scrub communities that do not support the alder found in this site. Differences in exposure and soil properties, including cryoturbation in R236XY132AK, create separate reference plant communities.
R236XY130AK	Subarctic Scrub Scrub Tundra Loamy Plains and Hills R236XY130AK describes low scrub communities on hill toeslopes. These positions are downslope of areas described by R236XY124AK.

Similar sites

R236XY105AK	Subarctic Scrub Mosaic Gravelly Hillslopes Both sites support dense alder in the reference plant community. R236XY105AK supports a mosaic of alder and low shrub areas on hill backslopes. Those positions are downslope of the shoulder sites that support R236XY124AK.
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Table 1. Dominant plant species

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

Physiographic features

This site is on linear and convex shoulder slopes of hills and rolling plains. This is also a smaller site along lake margins. Elevation ranges from 70 to 1,980 feet above sea level. Slopes gradients vary from nearly level to very steep (0 – 42 percent, 60 percent max). This site is found at all aspects, though at smaller mapping scales (order 2), they may be restricted from north-facing slopes.

Table 2. Representative physiographic features

Landforms	(1) Plains > Plain (2) Hills > Hill
Runoff class	Medium to high
Flooding frequency	None
Ponding frequency	None
Elevation	30 – 590 m

Slope	0 – 40 %
Water table depth	Not specified
Aspect	W, NW, N, NE, E, SE, S, SW

Table 3. Representative physiographic features (actual ranges)

Runoff class	Low to high
Flooding frequency	None
Ponding frequency	None
Elevation	0 – 600 m
Slope	0 – 60 %
Water table depth	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 is the main source of water.

Soil features

Soils are primarily Spodosols (Soil Survey Staff, 2013). Spodic horizons and andic soil properties are a result of ash deposition. Soils are very deep and well drained. They support a cryic temperature regime and an udic moisture regime. Parent material is organic material over eolian deposits or loess.

Soil characteristics affecting vegetation include soil acidity and fertility. Low soil pH and low soil fertility are ideal conditions for alder colonization (Uchytel, 1989). Soil hydrology on these well drained soils does not appear to be a major driver of vegetation.

Correlated soil components in MLRA 236: Rolph; Clarkspoint; D36-Western maritime scrub loamy eolian slopes; E36-Maritime scrub-ashy till slopes; E36-Maritime scrub-gravelly till slopes; E36-Maritime scrub-meadow-silty till slopes

Table 5. Representative soil features

Parent material	(1) Eolian deposits (2) Loess
Surface texture	(1) Highly organic silt (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)	6.1 – 7.11 cm
Soil reaction (1:1 water) (0-25.4cm)	3.4 – 5.9

Subsurface fragment volume <=3" (Depth not specified)	Not specified
Subsurface fragment volume >3" (Depth not specified)	Not specified

Table 6. Representative soil features (actual values)

Drainage class	Somewhat poorly drained to well drained
Permeability class	Slow to moderate
Soil depth	150 cm
Surface fragment cover <=3"	0 %
Surface fragment cover >3"	0 %
Available water capacity (0-25.4cm)	6.1 – 7.87 cm
Soil reaction (1:1 water) (0-25.4cm)	3.4 – 5.9
Subsurface fragment volume <=3" (Depth not specified)	0 %
Subsurface fragment volume >3" (Depth not specified)	0 %

Ecological dynamics

This site is on upland linear to convex slopes of rolling plains and hill shoulders. It is also found along lake margins at a small scale. The reference plant community is a closed alder scrubland with an understory of low species richness.

Local site factors, including soil characteristics and erosion support two communities in the reference state. Soils are acidic Spodosols with low fertility (Soil Survey Staff, 2013). Alder seeds are excellent colonizers of bare soil after erosion events. Low soil pH and poor soil fertility are ideal conditions for alder colonization. Alder are nitrogen-fixing and are not restricted by a lack of this nutrient in disturbed areas (Uchytel, 1989). It is currently unknown what role the presence of andic soil properties plays on vegetation on this site. Slight browsing by moose on willow may occur on this site, but it does not appear to affect the ecological processes significantly enough to alter the communities.

This site has an alternate state develops after human activity, typically in and around towns and villages. In places where the shrub overstory is removed, trees such as balsam poplar (*Populus balsamifera*) may propagate. Under management, the lack of competition for space and light may allow regenerative trees to form a woodland community that has an understory of willow and bluejoint grass.

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 2.1 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 07CS01003 07DM00903 07MM21905 07MM01602 07CS17006 09AO03503 10SS02602 Modal points for community 1.2 07SS09601 07CS15604 10SS00203 Modal points for community 2.1 07CS16905

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	09/29/2026
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:
