USDA Natural Resources Conservation Service

Ecological site R236XY204AK
Subarctic Low Scrub Loamy Glaciated Hill Depressions

Last updated: 2/13/2024
Accessed: 05/16/2024

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).

Classification relationships

Alaska Vegetation Classification:
Open low scrubland (II.C.2 - level III) / Open low sweetgale-graminoid bog (II.C.2.j - level IV)
(Viereck et al., 1992)

Circumboreal Vegetation Map – Alaska-Yukon Region:
Southern Alaska Alder-Willow-Dwarf Birch Scrub
(Jorgensen and Meidinger, 2015)

BioPhysical Settings: 7617230 – Aleutian Wet Meadow and Herbaceous Peatland - Complex
(LANDFIRE, 2009)

Ecological site concept

This ecological site is in glaciated hill and plain depressions. Site elevation is typically between 200 and 700 feet above sea level. Slopes are gentle (2 - 8 percent). Soil hydrology is the major factor shaping the vegetation in this

landform. Soils are young and very poorly drained, with a water table throughout the growing season that selects for facultative wet to obligate wetland species.

The reference state supports one community. The reference plant community is characterized as an open low scrubland (Viereck et al., 1992). It is composed of a facultative to obligate wetland shrubs, graminoids and forbs atop groundcover of mosses and surface water.

Associated sites

R236XY124AK	**Subarctic Tall Scrub Loamy Convex Hillslopes** R236XY124AK describes tall scrubland communities on well drained plains and hill backslopes. It can be found surrounding the ecological site described by R236XY204AK, which is in plain and hill depressions.
R236XY131AK	**Subarctic Tussock-Scrub Frozen Plains** R236XY131AK describes a low scrubland on glaciated plains. The plain depressions described by R236XY204AK are found across glaciated plains.

Similar sites

R236XY129AK	**Subarctic Low Scrub Peat Coastal Plains** Both are depression sites supporting facultative to obligate wetland shrubs and graminoids. R236XY129 is restricted to coastal plain depressions. The influence of coastal spray and coastal storm surges create a unique reference plant community. These influences are not found in R236XY204AK.
R236XY144AK	**Subarctic Scrub Peat Terraces** R236XY144AK describes terraces and depressions on terraces. There is some overlap in vegetation between that site and R236XY204AK. R236XY144AK describes two communities distinguished by ponding frequency and length. Ponding does not occur in R236XY204AK and the reference plant community is stable.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Myrica gale* (2) *Andromeda polifolia*
Herbaceous	(1) *Carex* (2) *Calamagrostis canadensis*

Physiographic features

This site is in depressions on glaciated hills and plains. Elevation ranges from 200 to 700 feet above sea level. Slopes are nearly level to gentle (2 – 8 percent). This site is found at all aspects. A water table is present at the soil surface in May, June, and September.

Table 2. Representative physiographic features

Landforms	(1) Hills > Depression (2) Plains > Depression
Runoff class	Low to medium
Flooding frequency	None
Ponding frequency	None
Elevation	61–213 m
Slope	2–8%
Water table depth	0–152 cm
Aspect	W, NW, N, NE, E, SE, S, SW

Table 3. Representative physiographic features (actual ranges)

Runoff class	Low to medium
Flooding frequency	None
Ponding frequency	None
Elevation	6–796 m
Slope	2–10%
Water table depth	0–152 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)	75-100 days
Freeze-free period (characteristic range)	65-90 days
Precipitation total (characteristic range)	533-864 mm
Frost-free period (actual range)	75-100 days
Freeze-free period (actual range)	65-90 days
Precipitation total (actual range)	381-1,041 mm
Frost-free period (average)	90 days
Freeze-free period (average)	75 days
Precipitation total (average)	737 mm

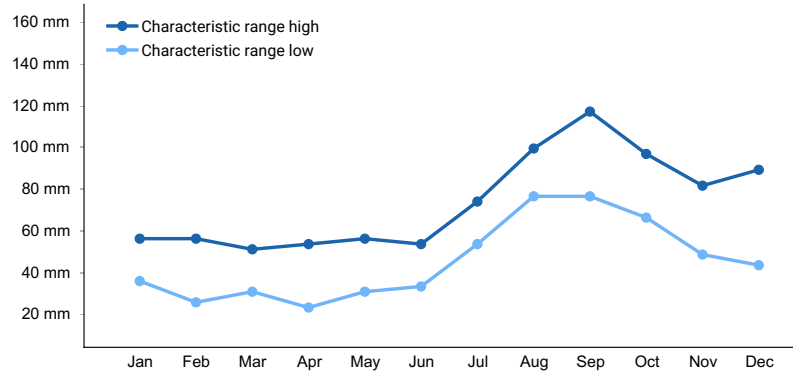


Figure 1. Monthly precipitation range

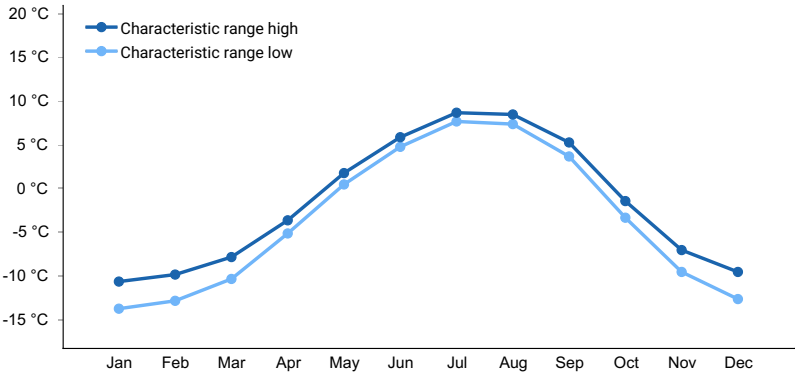


Figure 2. Monthly minimum temperature range

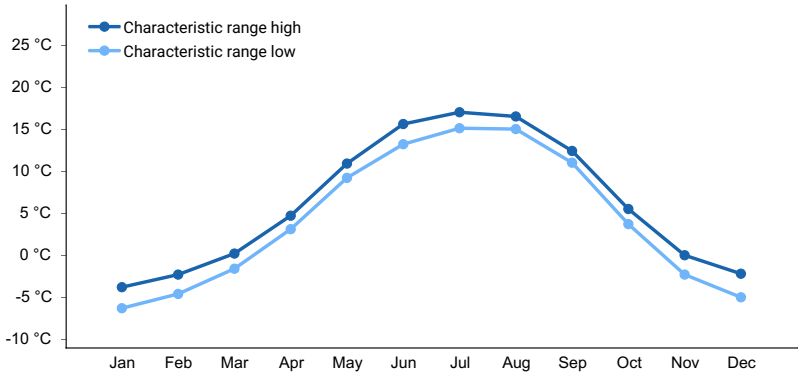


Figure 3. Monthly maximum temperature range

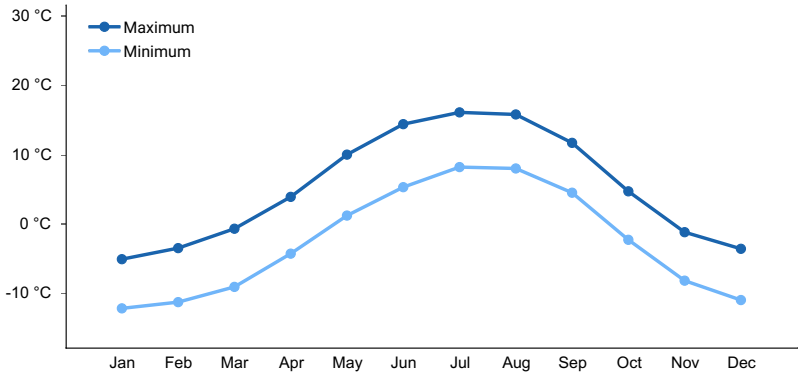


Figure 4. Monthly average minimum and maximum temperature

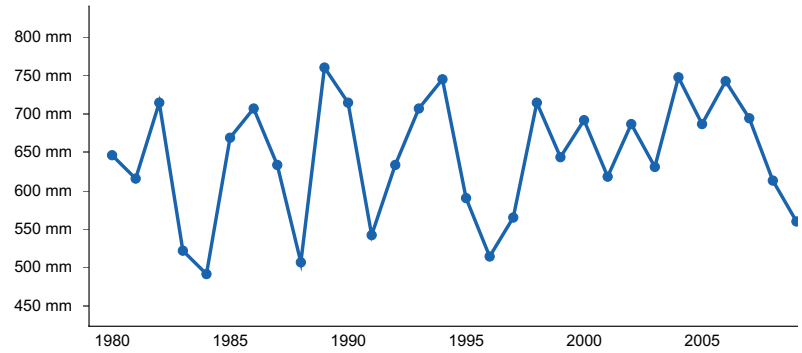


Figure 5. Annual precipitation pattern

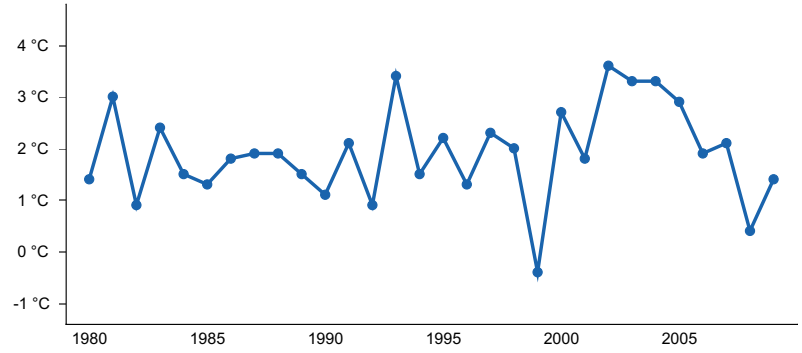


Figure 6. Annual average temperature pattern

Influencing water features

This ecological site is wet and supports a community of facultative to obligate wetland species. Emergent vegetation may be present in the wettest areas of depressions.

Soil features

Soils are Andisols, which are relatively young soils of volcanic origin (Soil Survey Staff, 2013). Soils are very deep and very poorly drained. They support a cryic temperature regime. Parent material is organic material over loamy volcanic ash over gravelly drift.

Soil hydrology is a major factor influencing vegetation. A water table is present at the soil surface in May, June, and September. Available water capacity is 10.6 in the top 40 inches of the soil. These characteristics affect vegetation by restricting the vegetation to primarily facultative wet to obligate species that can grow and reproduce in wet conditions.

Correlated soil components in the Nulato Hills area, Alaska (AK630): E36-Maritime scrub-ashy wet till slopes

Table 5. Representative soil features

Parent material	(1) Drift
Surface texture	(1) Silt loam
Drainage class	Very poorly drained
Permeability class	Moderate
Soil depth	152 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-25.4cm)	8.64 cm
Soil reaction (1:1 water) (0-25.4cm)	4.5–6
Subsurface fragment volume <=3" (Depth not specified)	4%
Subsurface fragment volume >3" (Depth not specified)	6%

Table 6. Representative soil features (actual values)

Drainage class	Very poorly drained
Permeability class	Moderate
Soil depth	152 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-25.4cm)	8.64 cm
Soil reaction (1:1 water) (0-25.4cm)	4.5–6
Subsurface fragment volume <=3" (Depth not specified)	4%
Subsurface fragment volume >3" (Depth not specified)	6%

Ecological dynamics

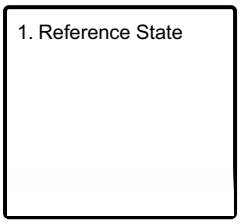
This site is in large depressions on glaciated hills and plains. Site elevation is between 200 and 700 feet above sea level. Slopes are gentle (2 - 8 percent). Soil hydrology is the major factor shaping the vegetation and is responsible for a reference plant community scrubland comprised of hydrophytic species.

Soils are very poorly drained. A water table is present at the soil surface in May, June, and September. Available water capacity is 10.6 in the top 40 inches of the soil. Soil wetness during the growing season restricts the vegetation to primarily facultative wet to obligate species. This community is stable and no known disturbance occurs that results in a distinctly different community.

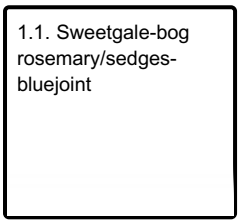
The information in this Ecological Dynamics section, including the state-and-transition model (STM), was developed based on current field data, professional experience, and a review of the scientific literature. As a result, all possible scenarios or plant species may not be included. Key indicator plant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

State and transition model

Ecosystem states



State 1 submodel, plant communities



State 1
Reference State

The reference state supports one stable community phase. The reference plant community is characterized by an open low scrubland comprised of hydrophytic shrubs and sometimes dense patches of facultative to obligate wetland graminoids and forbs. All community phases in this report are characterized using the Alaska vegetation classification system (Viereck et al., 1992)

Dominant plant species

- sweetgale (*Myrica gale*), shrub
- bog rosemary (*Andromeda polifolia*), shrub
- sedge (*Carex*), grass
- bluejoint (*Calamagrostis canadensis*), grass
- purple marshlocks (*Comarum palustre*), other herbaceous

Community 1.1
Sweetgale-bog rosemary/sedges-bluejoint

The reference plant community is an open low scrubland (Viereck et al., 1992). The major plant groups are low shrubs, medium graminoids, dwarf shrubs and medium forbs. This community is comprised of a mix of facultative to obligate wetland species. Community composition varies between and within locations depending on site characteristics including hydrology and depression size.

Dominant plant species

- sweetgale (*Myrica gale*), shrub
- bog rosemary (*Andromeda polifolia*), shrub
- sedge (*Carex*), grass
- bluejoint (*Calamagrostis canadensis*), grass

- purple marshlocks (*Comarum palustre*), other herbaceous

Additional community tables

Inventory data references

Vegetative communities and transitions are described using existing models and expert knowledge. There are no vegetation inventory data points in NASIS associated with this ecological site.

External data sources:
The Alaska Vegetation Classification (Viereck et al., 1992)
The Alaska-Yukon Region of the Circumboreal Vegetation Map (CBVM) (Jorgensen and Meidinger, 2015)
LANDFIRE Biophysical Settings Models (LANDFIRE, 2009)

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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

Jorgensen, T., and D. Meidinger. 2015. The Alaska Yukon Region of the Circumboreal Vegetation Map (CBVM). CAFF Strategies Series Report. Conservation of Arctic Flora and Fauna, Akureyri, Iceland. ISBN: 978-9935-431-48-6.

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).

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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	05/16/2024
Approved by	Kirt Walstad
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):**

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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:**