

# Ecological site R236XY203AK

## Subarctic Tall Scrub Wet Loamy Mountain Slopes

Last updated: 2/13/2024  
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### 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 foothills. 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 foothills. 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 tall scrubland (II.B.2 - level III) / Open willow-alder scrubland (II.B.2.d - level IV)  
(Vioreck et al., 1992)

Circumboreal Vegetation Map – Alaska-Yukon Region:

Southern Alaska Alder-Willow-Dwarf Birch Scrub  
(Jorgensen and Meidinger, 2015)

BioPhysical Settings: 7616390 – Arctic Mesic-Wet Willow Shrubland  
(LANDFIRE, 2009)

### Ecological site concept

This ecological site is on mountain backslopes and foothills. It is associated with poorly drained soils. Site elevation is between 500 and 1,600 feet above sea level. Slope gradient is strong (5 – 15 percent). Soil hydrology

has a major influence on vegetation on this landform. Soils are poorly drained and weakly developed and a water table present during growing season are ideal for hydrophytic shrubs.

The reference state supports one community. The reference plant community is characterized as a tall open scrubland (Viereck et al., 1992). It is composed of a mix of willow and alder with various low shrubs, graminoids and forbs in the understory.

### Associated sites

R236XY104AK	<b>Alpine Dwarf Scrub Gravelly Slopes</b> R236XY104AK describes subalpine positions that support a mix of alpine and ericaceous shrubs. It is at higher elevations than R236XY203AK and does not support the willow and alder associated with poorly drained soils at lower elevations.
R236XY106AK	<b>Subarctic Dwarf Scrub Dry Loamy Slopes</b> R236XY106AK describes the low ericaceous shrubland found on well drained, convex mountain backslopes and shoulders. It is on steeper slopes than R236XY203AK and does not support tall shrubs.
R236XY107AK	<b>Western Alaska Maritime Scrub Gravelly Drainages</b> R236XY107AK describes drainages and swales on mountain backslopes and footslopes. These swales can be found on the same slopes described by R236XY203AK.

### Similar sites

F236XY116AK	<b>Boreal Forest Loamy Wet Slopes</b> R236XY203AK may be misidentified as a burn sere from a forest ecological site. Historic and current data should be reviewed to determine whether a willow-alder site is capable of supporting one or more tree species in the reference plant community.
R236XY107AK	<b>Western Alaska Maritime Scrub Gravelly Drainages</b> R236XY107AK describes willow swales and drainages. Vegetation is similar. However, these landforms can be susceptible to ponding, which typically excludes alder and other less hydrophytic species.
R236XY124AK	<b>Subarctic Tall Scrub Loamy Convex Hillslopes</b> Both sites support tall shrubs in the reference plant community. The soils in R236XY124AK are well drained and it is unlikely that the reference plant community will match one associated with poorly drained soil. Further data are required to fully differentiate these sites.

**Table 1. Dominant plant species**

Tree	Not specified
Shrub	(1) <i>Salix pulchra</i> (2) <i>Alnus</i>
Herbaceous	(1) <i>Carex</i>

### Physiographic features

This site is on backslopes and footslopes of glaciated mountains. Elevation ranges from 500 to 1,600 feet above sea level. Slopes are gently to strongly sloped (6 – 15 percent). This site is usually not found at northerly aspects. A water table is present at the beginning of the growing season in May and June.

**Table 2. Representative physiographic features**

Hillslope profile	(1) Backslope (2) Footslope
Landforms	(1) Mountains > Mountain slope
Runoff class	Medium to high
Flooding frequency	None
Ponding frequency	None

Elevation	152–488 m
Slope	6–15%
Water table depth	0–152 cm
Aspect	W, NW, E, SE, S, SW

**Table 3. Representative physiographic features (actual ranges)**

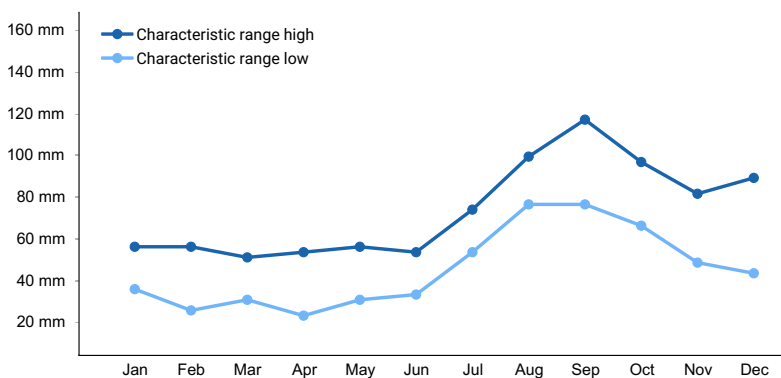
Runoff class	Low to high
Flooding frequency	None
Ponding frequency	None
Elevation	34–994 m
Slope	4–25%
Water table depth	0–152 cm

### Climatic features

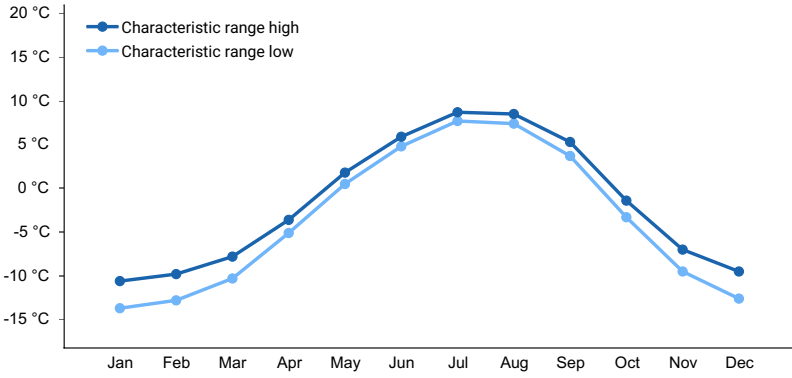
The climate of this site reflects that of the MLRA, which is described as maritime polar (EPA, 2013). Temperatures are moderated by the nearby Bristol Bay and northern Pacific bodies of water. Annual precipitation ranges from 21 – 34 inches with approximately 40 percent occurring during the June–September growing season (PRISM, 2018).

**Table 4. Representative climatic features**

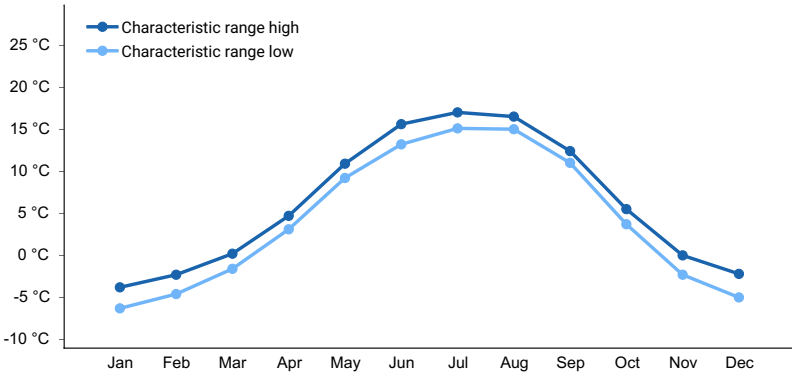
Frost-free period (characteristic range)	75-100 days
Freeze-free period (characteristic range)	65-90 days
Precipitation total (characteristic range)	533-864 mm
Frost-free period (actual range)	75-100 days
Freeze-free period (actual range)	65-90 days
Precipitation total (actual range)	381-1,041 mm
Frost-free period (average)	90 days
Freeze-free period (average)	75 days
Precipitation total (average)	737 mm



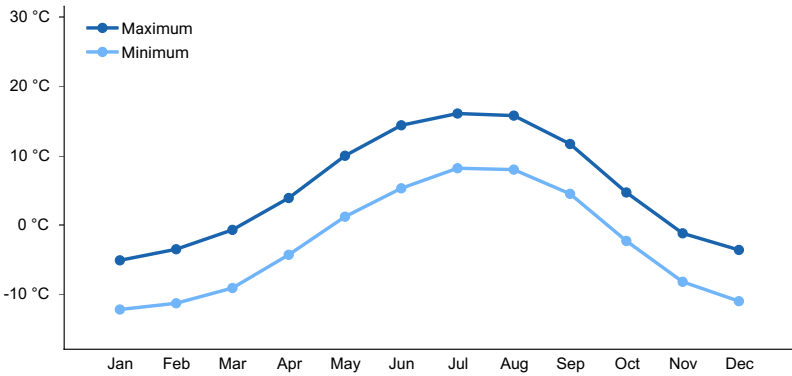
**Figure 1. Monthly precipitation range**



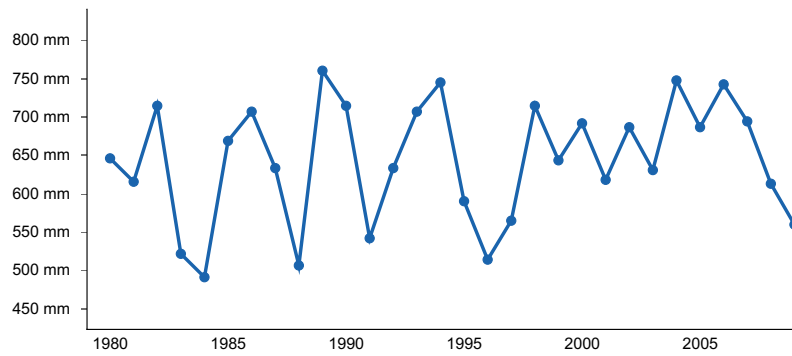
**Figure 2. Monthly minimum temperature range**



**Figure 3. Monthly maximum temperature range**



**Figure 4. Monthly average minimum and maximum temperature**



**Figure 5. Annual precipitation pattern**

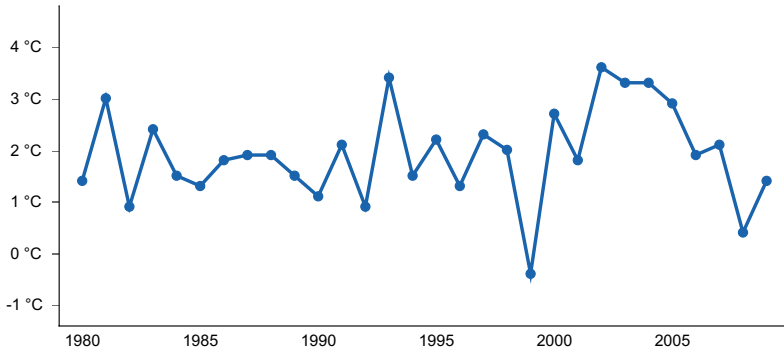


Figure 6. Annual average temperature pattern

### Influencing water features

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 Inceptisols, which are young and weakly developed soils (Soil Survey Staff, 2013). Soils are very deep and poorly drained. They support a cryic temperature regime. Parent material is mossy organic material over silty eolian deposits over gravelly till.

Soil hydrology is a major driver of vegetation. Soils are poorly drained and available water capacity is 8.1 inches in the top 40 inches of the soil profile. A water table is present at the soil surface in May and June. Wet soils influence the vegetation by restricting the vegetation that can grow during the short growing season.

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

Table 5. Representative soil features

Parent material	(1) Till
Surface texture	(1) Silt loam
Drainage class	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)	9.91 cm
Soil reaction (1:1 water) (0-25.4cm)	4.9–6.2
Subsurface fragment volume <=3" (Depth not specified)	28%
Subsurface fragment volume >3" (Depth not specified)	20%

Table 6. Representative soil features (actual values)

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Permeability class	Moderate
Soil depth	152 cm

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## Ecological dynamics

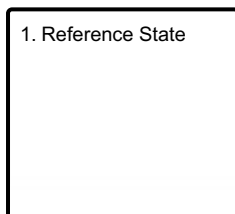
This site is on mountain backslopes and footslopes. It is associated with poorly drained soils. Elevation ranges from 500 to 1,600 feet above sea level. Slopes gradients are strong (5 – 15 percent) but slopes are stable. Soil characteristics including hydrology and weak development shape the reference plant community.

This community is relatively stable (LANDFIRE, 2009), and there is no known post-disturbance community. Soils are weakly developed with a large percentage of surface rock fragments. They are poorly drained, with a water table in May and June. These conditions are ideal for hydrophytic shrubs and herbaceous species. Fire is likely rare on these wet slopes. Tealeaf willow is a fire adapted species that when burned will quickly resprout from surviving rootstock (Uchytel, 1991).

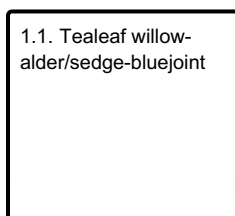
The information in this Ecological Dynamics section, including the state-and-transition model (STM), was developed based on current field data, professional experience, and a review of the scientific literature. As a result, all possible scenarios or plant species may not be included. Key indicator plant 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 community phase. The reference plant community is characterized by an open tall scrubland. All community phases in this report are characterized using the Alaska vegetation classification system (Viereck et al., 1992).

### Dominant plant species

- tealeaf willow (*Salix pulchra*), shrub
- grayleaf willow (*Salix glauca*), shrub

- alder (*Alnus*), shrub
- bog blueberry (*Vaccinium uliginosum*), shrub
- sedge (*Carex*), grass
- bluejoint (*Calamagrostis canadensis*), grass

## Community 1.1

### Tealeaf willow-alder/sedge-bluejoint

The reference plant community is an open tall scrubland (Viereck et al., 1992). The major plant groups are tall shrubs, medium shrubs, and medium graminoids. The overstory is typically comprised of alder and one or more species of willow. Willow species may include tealeaf (*Salix pulchra*), grayleaf (*S. glauca*), and Barclay's (*S. barclayi*). The understory varies and can support a variety of low shrubs, graminoids and forbs. Ground cover is a mix of herbaceous litter and mosses. This community is relatively stable (LANDFIRE, 2009). Fire is likely rare on these wet slopes. Tealeaf willow is a fire adapted species that when burned will quickly resprout from surviving rootstock (Uchytel, 1991).

#### Dominant plant species

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- bluejoint (*Calamagrostis canadensis*), grass

### 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 Biophysical Settings, 2009)

### 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

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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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.

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

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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.

Viereck, L.A., C.T. Dyrness, A.R. Batten, and K.J. Wenzlick. 1992. The Alaska vegetation classification. Gen. Tech. Rep. PNW-GTR-286. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 278 p.

## Contributors

Phil Barber  
Steph Schmit  
Steff Shoemaker  
Jamin Johanson

## 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	05/15/2024
Approved by	Kirt Walstad
Approval date	



## Indicators

1. **Number and extent of rills:**  

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2. **Presence of water flow patterns:**  

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3. **Number and height of erosional pedestals or terracettes:**  

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**  

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5. **Number of gullies and erosion associated with gullies:**  

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6. **Extent of wind scoured, blowouts and/or depositional areas:**  

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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):**
- 

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:**
-