

Ecological site R236XY158AK Boreal Tall Scrub Gravelly Flood Plains

Last updated: 2/13/2024
Accessed: 05/19/2024

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.

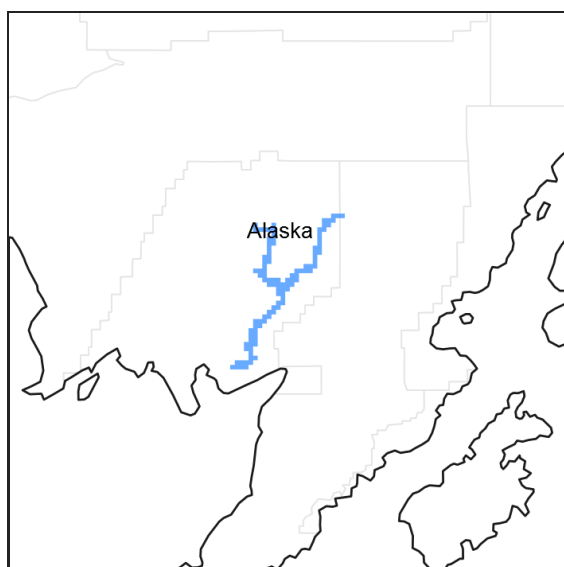


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

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 lowland flood plains. Site elevation is between 20 and 810 feet above sea level. Slopes are nearly level (0 - 2 percent). Soil hydrology, a large volume of soil fragments, and a flood regime shape the vegetation on this landform. Brief, occasional flooding and ponding during the growing season restricts vegetation. However, the high volume of subsurface rock fragments keeps the soil well drained, allowing taller, less hydrophytic species to grow.

The reference state supports one community. The reference plant community is characterized as a closed tall scrubland (Vioreck et al., 1992). It is composed of alder and one or more species of willow in the overstory, with an understory of bluejoint and various forbs. This community is very resilient to the flooding events it experiences.

Associated sites

F236XY111AK	Boreal Forest Loamy Flood Plains F236XY111AK describes lowland forested flood plains. They are rarely flooded and support a forested reference plant community. It is typically found at higher elevations on the flood plain than the scrubland described by R236XY158AK.
R236XY121AK	Boreal Tall Scrub Loamy Flood Plains Both are lowland flood plains sites. Soils are wetter in R236XY121AK and flooding is more disruptive in R236XY158AK. This site is typically found closer to the flood source.

Similar sites

R236XY121AK	Boreal Tall Scrub Loamy Flood Plains Both sites are on mid flood plains. Vegetation in R236XY121AK is more restricted by soil hydrology (redox concentrations present), while flooding is more intense in R236XY158AK. Differences in soil and disturbance regime result in unique reference plant communities.
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Alnus</i> (2) <i>Salix alaxensis</i>
Herbaceous	(1) <i>Calamagrostis canadensis</i> (2) <i>Impatiens noli-tangere</i>

Physiographic features

This site is on lowland flood plains. Elevation ranges from 20 to 810 above sea level. Slopes are nearly level (0 – 2 percent). This site is found at all aspects. Flooding and ponding are both occasional and brief events.

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	Occasional
Ponding duration	Brief (2 to 7 days)

Ponding frequency	Occasional
Elevation	6–247 m
Slope	0–2%
Water table depth	152 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	Occasional
Ponding duration	Brief (2 to 7 days)
Ponding frequency	Occasional
Elevation	0–247 m
Slope	0–2%
Water table depth	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

Influencing water features

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

Soil features

Soils are young and weakly developed Inceptisols (Soil Survey Staff, 2013). Soils are very deep and well drained. They support a cryic temperature regime and an udic moisture regime. Parent material is grassy organic material over coarse-loamy alluvium over sandy and gravelly alluvium.

Soil properties mitigate the effects of ponding and flooding on this site. Soils are well drained, with a large percentage of small fragments making up subsurface volume.. Available water capacity is relatively low. Vegetation is not restricted to facultative wet or obligate wetland species.

Correlated soil components in MLRA 236: D36-Boreal scrub gravelly flood plains

Table 5. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Silt loam
Drainage class	Well drained
Permeability class	Moderate
Soil depth	152 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-25.4cm)	3.3–4.83 cm
Soil reaction (1:1 water) (0-25.4cm)	4.4–5.8
Subsurface fragment volume <=3" (Depth not specified)	70%
Subsurface fragment volume >3" (Depth not specified)	0%

Table 6. Representative soil features (actual values)

Drainage class	Well drained
Permeability class	Moderate
Soil depth	152 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-25.4cm)	3.3–4.83 cm
Soil reaction (1:1 water) (0-25.4cm)	4.4–5.8
Subsurface fragment volume <=3" (Depth not specified)	70%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

This site is on well drained, lowland flood plains. Local site factors including soil characteristics and a flooding disturbance regime support one vegetative community. The reference plant community is a closed tall scrubland (Vioreck et al., 1992).

This flood plain supports a closed tall scrubland of alder and willow, with fast growing graminoids and forbs in the understory. Disturbed, gravelly, well-drained soil is ideal substrate for alder. The community is stable, as extant species are resilient to flood scouring and post-flood ponding. Trees may colonize this site, but a woodland is unlikely to develop. The forces dictating the presence of trees is unknown but is likely related to site-specific soil characteristics, less energetic flooding, and intense propagule pressure from nearby forested areas.

Slight to moderate browsing by moose on willow occurs on this site. This does not appear to 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

Ecosystem states

1. Reference State

State 1 submodel, plant communities

1.1. Alder–
willow/bluejoint
grass/horsetails–
western touch-me-not
scrubland

State 1 Reference State

The reference state supports one community phase. The reference plant community is characterized by a scrubland consisting of medium and tall shrubs and an open understory of graminoids and forbs. This community is stable. All community phases in this report are characterized using the Alaska vegetation classification system (Vioreck et al., 1992).

Dominant plant species

- alder (*Alnus*), shrub
- willow (*Salix*), shrub
- bluejoint (*Calamagrostis canadensis*), grass
- horsetail (*Equisetum*), other herbaceous

Community 1.1

Alder–willow/bluejoint grass/horsetails–western touch-me-not scrubland



Figure 8. Typical area of community 1.1.

Community Phase Canopy Cover

(Vegetation data in the table are provided as constancy (percent) and average canopy cover (percent) of the most dominant and ecologically relevant species for this community phase.)

Plant group	Common name	Scientific name	USDA plant code	Constancy (percent)	Average canopy cover (percent)
S	Feltleaf willow	<i>Salix alaxensis</i>	SAAL	77	15
S	Sitka alder	<i>Alnus viridis</i> ssp. <i>sinuata</i>	ALVIS	62	50
S	Thinleaf alder	<i>Alnus incana</i> ssp. <i>tenuifolia</i>	ALINT	46	60
G	Bluejoint grass	<i>Calamagrostis canadensis</i>	CACA4	100	50
F	Western touch-me-not	<i>Impatiens noli-tangere</i>	IMNO	77	20
F	Northern bedstraw	<i>Galium boreale</i>	GABO2	69	2
F	Common ladyfern	<i>Athyrium filix-femina</i>	ATFI	54	3
F	Spreading woodfern	<i>Dryopteris expansa</i>	DREX2	46	15
F	Horsetails	<i>Equisetum</i> spp.	EQUIS	77, 53, 8*	15, 15, 40

* Horsetails (*Equisetum* spp.) are represented by three species—*E. arvense*, *E. pratense* and *E. sylvaticum*, respectively.

Figure 9. Constancy and canopy cover of plants in community 1.1.

The reference community phase is characterized by tall scrubland that has an understory of minimal species of graminoids and forbs. Typically, this community consists of an overstory of tall Sitka alder (*Alnus viridis* ssp. *sinuata*), thinleaf alder (*Alnus incana* ssp. *tenuifolia*), and feltleaf willow (*Salix alaxensis*) and an understory of bluejoint grass (*Calamagrostis canadensis*), western touch-me-not (*Impatiens noli-tangere*), common ladyfern (*Athyrium filix-femina*), and spreading woodfern (*Dryopteris expansa*). Other species may include tealeaf willow (*Salix pulchra*), horsetails (*Equisetum* spp.), stinging nettle (*Urtica dioica*), and northern bedstraw (*Galium boreale*). A low amount of mosses commonly is in the ground cover (about 10 percent total mean cover), and lichens generally are a minor component of the overall vegetative community. The ground cover commonly also includes herbaceous litter (about 65 percent cover) and woody litter (about 8 percent). About 30 percent is bare soil. Flooding commonly does not scour the vegetation on this site. Because of the flooding and ponding, the overall richness and abundance of the hydrophilic, disturbance-loving plants are relatively stable. Differences in the populations of alder (*Alnus* spp.), willow (*Salix* spp.), and bluejoint grass (*Calamagrostis canadensis*) may be evident in areas.

Additional community tables

Inventory data references

Modal points for Community 1.1

08SS09502

08SS10406

08SS11210

09SS10001

09SS11007

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..

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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	05/19/2024
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):**

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:**
