Ecological site R237XY208AK
Western Alaska Maritime Scrubland Peat Depressions

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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): 237X–Ahklun Mountains

The Ahklun Mountains Major Land Resource Area (MLRA 237) is in western Alaska (fig. 3). This MLRA covers approximately 14,555 square miles, and it includes the mountains, hills, and valleys of the Kilbuck Mountains in the north and the Ahklun Mountains in the south. Except for the Kilbuck Mountains and the highest ridges of the Ahklun Mountains, the MLRA was extensively glaciated during the Pleistocene (Kautz et al., 2004). Today, a few small glaciers persist in mountainous cirques (Gallant et al., 1995). The present-day landscape and landforms reflect this glacial history; glacial moraines and glacial drift cover much of the area (USDA-NRCS, 2006). The landscape of the MLRA is primarily defined by low, steep, rugged mountains cut by narrow-to-broad valleys. Flood plains and terraces of varying sizes are common at the lower elevations in the valley bottoms. Glacially carved valleys host many lakes. Togiak Lake is one of the largest lakes in the region. It is 13 miles long and about 9,500 acres in size. Major rivers include the Goodnews, Togiak, Kanektok, Osviak, Eek, and Arolik Rivers. Where the Goodnews and Togiak Rivers reach the coast, the nearly level to rolling deltas support numerous small lakes.

This MLRA has two distinct climatic zones: subarctic continental and maritime continental (fig. 4). The high-elevation areas are in the subarctic continental zone. The mean annual precipitation is more than 75 inches, and the mean annual air temperature is below about 27 degrees F (-3 degrees C) in extreme locations. The warmer, drier areas at the lower elevations are in the maritime continental zone. The mean annual precipitation is 20 to 50 inches, and the mean annual air temperature is about 30 to 32 degrees F (-0.2 to 1.2 degrees C) (PRISM). This climatic zone is influenced by both maritime and continental factors. The temperatures in summer are moderated by the open waters of the Bering Sea, and the temperatures in winter are more continental due to the presence of ice in the sea (Western Regional Climate Center, 2017). The seasonal ice reaches its southernmost extent off the coast of Alaska in Bristol Bay (Alaska Climate Research Center, 2017). The western coast of Alaska is also influenced by high winds from strong storms and airmasses in the Interior Region of Alaska (Hartmann, 2002).

The Ahklun Mountains MLRA is principally undeveloped wilderness. Federally managed lands include the Togiak and Alaska Maritime National Wildlife Refuges. The MLRA is sparsely populated, but it has several communities, including Togiak, Manokotak, Twin Hills, and Goodnews Bay. Togiak is the largest village. It has a population of approximately 855, most of which are Yup'ik Alaska Natives (U.S. Census Bureau, 2016). Major land uses include subsistence activities (fishing, hunting, and gathering) and wildlife recreation (USDA-NRCS, 2006; Kautz et al., 2004).

Ecological site concept

Ecological site R237XY208AK is in organic depressions of flood plains, plains, mountain valleys, and shore complexes throughout the Ahklun Mountains area. Landform, soil characteristics, and hydrology influence the existing plants and create a unique ecological site. This site is correlated to four distinct, very poorly drained soils. The reference state supports the reference plant community and an early community phase caused by ponding.

The reference plant community is an open low scrubland (Viereck et al., 1992). Facultative and obligate wetland

plants are dominant in this community. Common plants include dwarf birch (Betula nana), bog blueberry (*Vaccinium uliginosum*), black crowberry (Empetrum nigrum), cloudberry (Rubus chamaemorus), sweetgale (Myrica gale), water sedge (Carex aquatilis), and tufted bulrush (Trichophorum cespitosum).

Associated sites

R237XY226AK	**Western Alaska Maritime Grassland Peat Flood Plains, Depression** Ecological site R237XY208AK is in organic depressions of plains, mountain valleys, flood plains, and shore complexes. Dominant ecological sites associated with this site include R237XY201AK, R237XY205AK, R237XY215AK, R237XY220AK, R237XY222AK, R237XY223AK, R237XY226AK, and R237XY236AK. These sites typically are differentiated by one or more criteria, including landform, landform position, associated soils, associated disturbance regimes, and the type and amount of plants. Ecotonal plant communities that have characteristics from more than one ecological site are in areas where these sites abut. This is especially noticeable in smaller depressions where species from surrounding sites extend farther into the depressional area.
R237XY220AK	**Western Alaska Maritime Mosaic Loamy Hummocks** Ecological site R237XY208AK is in organic depressions of plains, mountain valleys, flood plains, and shore complexes. Dominant ecological sites associated with this site include R237XY201AK, R237XY205AK, R237XY215AK, R237XY220AK, R237XY222AK, R237XY223AK, R237XY226AK, and R237XY236AK. These sites typically are differentiated by one or more criteria, including landform, landform position, associated soils, associated disturbance regimes, and the type and amount of plants. Ecotonal plant communities that have characteristics from more than one ecological site are in areas where these sites abut. This is especially noticeable in smaller depressions where species from surrounding sites extend farther into the depressional area.
R237XY222AK	**Western Alaska Maritime Scrubland Loamy Hummocks** Ecological site R237XY208AK is in organic depressions of plains, mountain valleys, flood plains, and shore complexes. Dominant ecological sites associated with this site include R237XY201AK, R237XY205AK, R237XY215AK, R237XY220AK, R237XY222AK, R237XY223AK, R237XY226AK, and R237XY236AK. These sites typically are differentiated by one or more criteria, including landform, landform position, associated soils, associated disturbance regimes, and the type and amount of plants. Ecotonal plant communities that have characteristics from more than one ecological site are in areas where these sites abut. This is especially noticeable in smaller depressions where species from surrounding sites extend farther into the depressional area.
R237XY223AK	**Western Alaska Maritime Graminoid Gravelly Plains, Berms** Ecological site R237XY208AK is in organic depressions of plains, mountain valleys, flood plains, and shore complexes. Dominant ecological sites associated with this site include R237XY201AK, R237XY205AK, R237XY215AK, R237XY220AK, R237XY222AK, R237XY223AK, R237XY226AK, and R237XY236AK. These sites typically are differentiated by one or more criteria, including landform, landform position, associated soils, associated disturbance regimes, and the type and amount of plants. Ecotonal plant communities that have characteristics from more than one ecological site are in areas where these sites abut. This is especially noticeable in smaller depressions where species from surrounding sites extend farther into the depressional area.
R237XY201AK	**Western Alaska Maritime Scrubland Gravelly Slopes** Ecological site R237XY208AK is in organic depressions of plains, mountain valleys, flood plains, and shore complexes. Dominant ecological sites associated with this site include R237XY201AK, R237XY205AK, R237XY215AK, R237XY220AK, R237XY222AK, R237XY223AK, R237XY226AK, and R237XY236AK. These sites typically are differentiated by one or more criteria, including landform, landform position, associated soils, associated disturbance regimes, and the type and amount of plants. Ecotonal plant communities that have characteristics from more than one ecological site are in areas where these sites abut. This is especially noticeable in smaller depressions where species from surrounding sites extend farther into the depressional area.
R237XY205AK	**Western Alaska Maritime Scrubland Loamy Swales** Ecological site R237XY208AK is in organic depressions of plains, mountain valleys, flood plains, and shore complexes. Dominant ecological sites associated with this site include R237XY201AK, R237XY205AK, R237XY215AK, R237XY220AK, R237XY222AK, R237XY223AK, R237XY226AK, and R237XY236AK. These sites typically are differentiated by one or more criteria, including landform, landform position, associated soils, associated disturbance regimes, and the type and amount of plants. Ecotonal plant communities that have characteristics from more than one ecological site are in areas where these sites abut. This is especially noticeable in smaller depressions where species from surrounding sites extend farther into the depressional area.

R237XY215AK	**Western Alaska Maritime Scrubland Loamy Plains** Ecological site R237XY208AK is in organic depressions of plains, mountain valleys, flood plains, and shore complexes. Dominant ecological sites associated with this site include R237XY201AK, R237XY205AK, R237XY215AK, R237XY220AK, R237XY222AK, R237XY223AK, R237XY226AK, and R237XY236AK. These sites typically are differentiated by one or more criteria, including landform, landform position, associated soils, associated disturbance regimes, and the type and amount of plants. Ecotonal plant communities that have characteristics from more than one ecological site are in areas where these sites abut. This is especially noticeable in smaller depressions where species from surrounding sites extend farther into the depressional area.
R237XY236AK	**Western Alaska Maritime Graminoid Peat Plains** Ecological site R237XY208AK is in organic depressions of plains, mountain valleys, flood plains, and shore complexes. Dominant ecological sites associated with this site include R237XY201AK, R237XY205AK, R237XY215AK, R237XY220AK, R237XY222AK, R237XY223AK, R237XY226AK, and R237XY236AK. These sites typically are differentiated by one or more criteria, including landform, landform position, associated soils, associated disturbance regimes, and the type and amount of plants. Ecotonal plant communities that have characteristics from more than one ecological site are in areas where these sites abut. This is especially noticeable in smaller depressions where species from surrounding sites extend farther into the depressional area.

Similar sites

R237XY204AK	**Western Alaska Maritime Scrubland Loamy Slopes** Ecological site R237XY208AK is unique. Sites R237XY204AK and R237XY224AK also support low and dwarf shrubs and have some plant species that are in site R237XY208AK; however, site R237XY208AK does not support the large communities of lichen common in the reference plant community of sites R237XY204AK and R237XY224AK.
R237XY224AK	**Western Alaska Maritime Scrubland Gravelly Plains, Berms** Ecological site R237XY208AK is unique. Sites R237XY204AK and R237XY224AK also support low and dwarf shrubs and have some plant species that are in site R237XY208AK; however, site R237XY208AK does not support the large communities of lichen common in the reference plant community of sites R237XY204AK and R237XY224AK.
R237XY226AK	**Western Alaska Maritime Grassland Peat Flood Plains, Depression** Ecological site R237XY208AK is on landforms similar to those of site R237XY226AK, which is associated with mineral depressions. These ecological sites are differentiated by the shrubs (ericaceous versus willow), graminoids (cottongrasses and bulrushes versus bluejoint), and soils (organic versus mineral).

Figure 1. Some areas of ecological site R237XY208AK are associated with ponds or lakes.

Figure 2. The early ponding community consists dominantly of graminoids.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Vaccinium uliginosum* (2) *Andromeda polifolia*
Herbaceous	(1) *Trichophorum* (2) *Carex*

Physiographic features

Site characteristics specifically relate to the reference plant community phase. Each ecological site has a specific set of site characteristics and disturbance dynamics that results in a unique plant community composition, structure, and function. Site characteristics (climate, geology, topography, and soil characteristics) are dynamic across a landscape. Subtle changes in site characteristics can result in a different plant community phase or ecological site. Definitions of site characteristics are provided in the United States Department of Agriculture Handbook 296 (USDA-NRCS, 2006), Geomorphic Description System (Schoeneberger and Wysocki, 2012), Field Book for Describing and Sampling Soils (Schoeneberger et al., 2012), and Soil Survey Manual (Soil Science Division Staff, 2017).

Landform: Flood plains, plains, mountain valleys, shore complexes

Landform position: Depressions

Elevation: 0 to 2,700 feet

Slope: 0 to 3 percent

Slope shape: Concave to linear

Aspect: All aspects

Drainage class: Very poorly drained

Ponding: Mosquitopoint, occasional ponding, and Snakeriver, occasional ponding—occasional, brief; Snakeriver, rare flooding—frequent, long; Ekiligamut—none

Depth to water table: Ekiligamut; Mosquitopoint, occasional ponding; Snakeriver, rare flooding; and Snakeriver, occasional ponding—at the surface in April through September

Flooding: Ekiligamut—very frequent, extremely brief; Snakeriver, rare flooding—rare

Frost-free period: 75 to 140 days

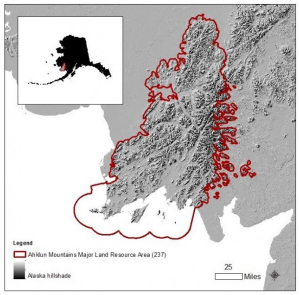


Figure 3. The Ahklun Mountains area (MLRA 237) is in western Alaska.

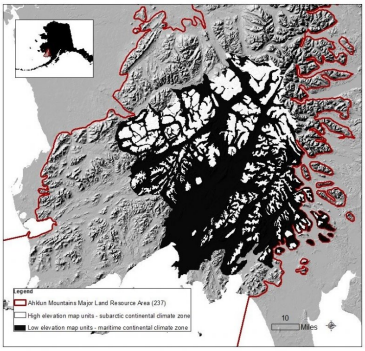


Figure 4. High-elevation and low-elevation map units in the area, which illustrate the primary climatic influence.

Table 2. Representative physiographic features

Slope shape across	(1) Concave
Slope shape up-down	(1) Concave (2) Linear
Landforms	(1) Plains > Depression (2) Coastal plain > Depression (3) Mountain valleys or canyons > Depression (4) Plains > Flood plain
Flooding duration	Extremely brief (0.1 to 4 hours)
Flooding frequency	None to very frequent
Ponding duration	Brief (2 to 7 days) to long (7 to 30 days)
Ponding frequency	None to frequent
Elevation	0–2,700 ft
Slope	0–3%
Aspect	W, NW, N, NE, E, SE, S, SW

Climatic features

Climate of land resource region (LLR): Maritime continental (Western Regional Climate Center, 2017); short, warm summers and long, cold winters (USDA-NRCS, 2006)

Climate of major land resource area (MLRA): Maritime continental in the lowlands and subarctic continental at higher elevations. The mean annual precipitation is 20 to 30 inches in the lowlands, and it increases to more than 45 inches at the higher elevations. The mean annual air temperature along the coast is about 34 degrees F (1 degree C) (PRISM, 2014). Strong winds are common throughout the year.

Table 3. Representative climatic features

Frost-free period (characteristic range)	75-140 days
Freeze-free period (characteristic range)	
Precipitation total (characteristic range)	

Influencing water features

Soil features

The Ekiligamut soils; Mosquitopoint soils, occasional ponding; Snakeriver soils, rare flooding; and Snakeriver soils, occasional ponding, are correlated to this ecological site. The saturated hydraulic conductivity is high in the organic layer of the soils, and it is moderately high or high in the mineral layer of the Mosquitopoint and Snakeriver soils and moderately high in the marine layer of the Ekiligamut soil. The upper part of the soils is very strongly acid to slightly acid. The wide range in reaction is a result of the tidal influences on the Ekiligamut soils.

Table 4. Representative soil features

Drainage class	Very poorly drained

Ecological dynamics

Plains, flood plains, mountain valleys, and shore complexes are throughout the Ahklun Mountains area. These landforms support myriad ecological sites distinguished by differences in landform, disturbance regime, soil characteristics, and vegetative communities.

Site R237XY208AK is in organic depressions of flood plains, plains, mountain valleys, and shore complexes. Landform features, soil characteristics, and disturbance regimes create this unique ecological site. The soils are very poorly drained and are suited to obligate and facultative wetland species.

Disturbance Dynamics

Hydrological influences

A seasonal water table resulting from flooding, ponding, and tides is the major influence on the vegetation in this ecological site. Ponding commonly inhibits oxygen to plants (Hook and Crawford, 1978; Jackson et al., 1991). Hypoxic and anoxic conditions are major abiotic stresses that partially determine the presence or absence of vascular plants. Temporal tolerance of oxygen deprivation differs among plant species, so the length of ponding that affects plants ranges from many hours to several weeks (Vartapetian and Jackson, 1996).

The frequency and length of ponding in the depressions varies. Low areas of the depressions are wetter than are the high areas. The low areas typically support community 1.2, and the high areas commonly support community 1.1. Permanently ponded water is in the center of some depression (figs. 1 and 2). Community 1.2 commonly surrounds the water, and community 1.1 makes up an outer ring.

Flooding

Flooding contributes to ponding. The depressions of shore complexes and flood plains can be inundated by freshwater from river flooding and by saltwater from tides and storm surges.

Other Observations

Current data show that regardless of the surrounding landscape, most organic depressions support similar wetland species and communities. Future data may be used to discern and describe separate ecological sites for depressions of different landforms based on characteristics not yet recorded, such as production. In areas of this ecological site on tidal marshes, the addition of brackish floodwater and groundwater may alter the vegetative community. Further monitoring is needed to determine if a unique ecological site is required.

Slight browsing by moose on shrubs and graminoids has been recorded in the reference plant community. This level of browsing does not warrant an early browse sere or alternate state.

No alternate states were observed for this ecological site.

State and transition model

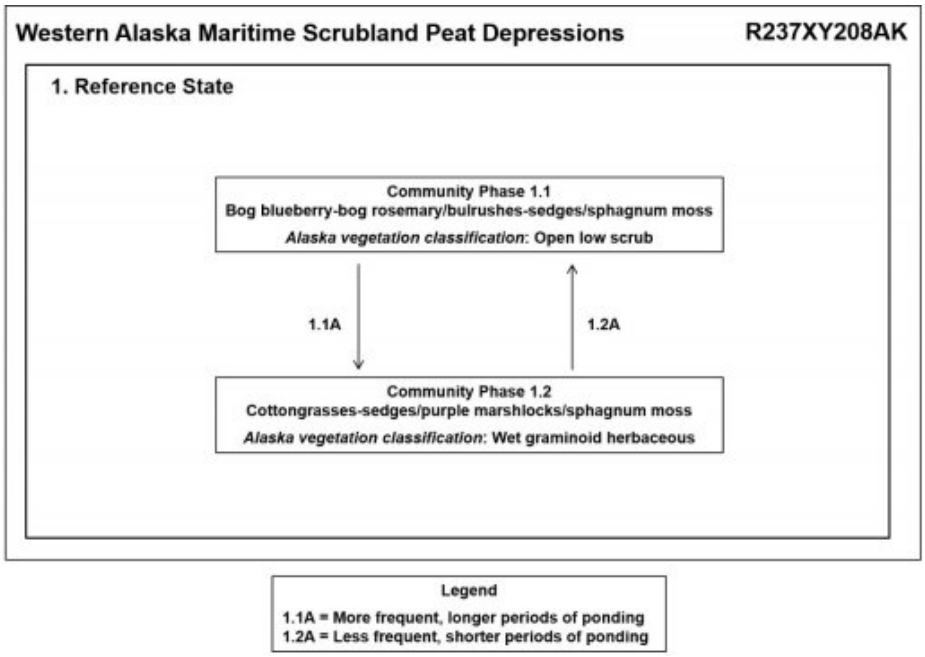


Figure 5. State-and-transition model.

State 1
Reference State

The reference state supports two community phases that are distinguished by the developed structure and dominance of the vegetation and the ecological function and stability of the community (fig. 5). The reference community phase is characterized by scrubland that consists of hydrophilic shrubs, forbs, and graminoids throughout. This report provides baseline vegetation inventory data. Future data collection is needed to provide further information about existing plant communities and the disturbance regime that results in community locations. Common and scientific names are from the USDA PLANTS database. All community phases are characterized by the Alaska Vegetation Classification System (Viereck et al., 1992).

Community 1.1
Bog blueberry-bog rosemary/bulrushes-sedges/sphagnum moss (Vaccinium uliginosum-Andromeda polifolia/Trichophorum spp.-Carex spp./Sphagnum spp.)

Figure 6. Typical area of plant community 1.1.

Community Phase 1.1 Canopy Cover Table

Vegetation data are aggregated across modal sample plots for this community phase and are provided as a frequency (percent) and mean canopy cover (percent) of the dominant and most ecologically relevant species. Canopy cover is represented as a mean with the range in parentheses.

Plant group	Common name	Scientific name	USDA plant code	Frequency (percent)	Mean canopy cover (percent)
S	Bog blueberry	*Vaccinium uliginosum*	VAUL	100	6 (1-10)
S	Dwarf birch	*Betula nana*	BENA	92	10 (0-30)
S	Black crowberry	*Empetrum nigrum*	EMNI	92	6 (0-20)
S	Bog rosemary	*Andromeda polifolia*	ANPO	83	1 (0-3)
S	Marsh Labrador tea	*Ledum palustre* ssp. *decumbens*	LEPAD	75	2 (0-5)
S	Sweetgale	*Myrica gale*	MYGA	25	5 (0-30)
G	Sedges^	*Carex* spp.	CAREX	100	30 (5-60)
G	Bulrushes^^	*Trichophorum* spp.	TRICH02	58	15 (0-40)
G	Looseflower alpine sedge	*Carex rariflora*	CARA5	58	15 (0-45)
G	Water sedge	*Carex aquatilis*	CAAQ	58	9 (0-30)
G	Alpine bulrush	*Trichophorum alpinum*	TRAL7	42	7 (0-30)
G	Tufted bulrush	*Trichophorum cespitosa*	TRCE3	25	6 (0-40)
F	Cloudberry	*Rubus chamaemorus*	RUCH	67	4 (0-20)
F	Round sundew	*Drosera rotundifolia*	DRRO	42	1 (0-3)
B	Sphagnum mosses	*Sphagnum* spp.	SPHAG2	100	55 (1-85)

^Sedges (*Carex* spp.) includes data for all sedges, including looseflower alpine sedge and water sedge.

^^Bulrushes (*Trichophorum* spp.) includes data for all bulrushes, including alpine bulrush and tufted bulrush.

This dataset includes data from 12 sample plots. The plots are distributed across the Arkalun Mountains area and are independent of one another.

Plant functional group classifications—T = trees, S = shrubs, G = graminoids, F = forbs, B = bryophytes, L = lichens

Canopy cover data are based on ocular estimates and rounded, except trace (0.1 percent) cover. Data ranging from 1 to 9 percent cover are rounded to the nearest integer. Data ranging from 10 to 100 percent cover are rounded to the nearest factor of 5.

Figure 7. Canopy cover and frequency of species in community 1.1.

The reference plant community is characterized as open low scrub (fig. 6) (Viereck et al., 1992). The major vegetative strata are mosses, medium graminoids (4 to 24 inches in height), dwarf shrubs (less than 8 inches), and lichens (fig. 7). The plants are dominantly facultative or obligate wetland species. Common shrubs include dwarf birch, bog blueberry, bog rosemary, and sweetgale. Graminoids include various hydrophilic sedges (Carex spp.) and bulrushes (Trichophorum spp.) such as looseflower alpine sedge (C. rariflora), water sedge, tufted bulrush, and alpine bulrush (*Trichophorum alpinum*). Other species include cottongrasses (Eriophorum spp.), cloudberry, field horsetail (*Equisetum arvense*), round sundew (*Drosera rotundifolia*), and shrubby cinquefoil (*Dasiphora fruticosa*). The ground cover typically is dominantly sphagnum mosses (Sphagnum spp.), but it may include herbaceous litter and water.

Community 1.2
Cottongrasses-sedges/purple marshlocks/sphagnum moss (Eriophorum spp.-Carex spp./Comarum palustre/Sphagnum spp.)

Figure 8. Typical area of plant community 1.2.

Community Phase 1.2 Canopy Cover Table

Vegetation data are aggregated across modal sample plots for this community phase and are provided as a frequency (percent) and mean canopy cover (percent) of the dominant and most ecologically relevant species. Canopy cover is represented as a mean with the range in parentheses.

Plant group	Common name	Scientific name	USDA plant code	Frequency (percent)	Mean canopy cover (percent)
S	Bog rosemary	*Andromeda polifolia*	ANPO	71	1 (0-2)
S	Bog blueberry	*Vaccinium uliginosum*	VAUL	57	3 (0-15)
G	Sedges^	*Carex* spp.	CAREX	100	50 (30-85)
G	Water sedge	*Carex aquatilis*	CAAQ	71	40 (0-85)
G	Tall cottongrass	*Eriophorum angustifolium*	ERAN6	71	7 (0-20)
G	Red cottongrass	*Eriophorum russeolum*	ERRU2	57	9 (0-45)
G	Tufted bulrush	*Trichophorum cespitosa*	TRCE3	29	7 (0-50)
F	Purple marshlocks	*Comarum palustre*	COPA28	57	1 (0-3)
F	Buckbean	*Menyanthes trifoliata*	METR3	43	1 (0-3)
B	Sphagnum mosses	*Sphagnum* spp.	SPHAG2	100	55 (15-100)

^Sedges includes all *Carex* spp., including water sedge (*Carex aquatilis*).

This dataset includes data from seven sample plots. The plots are distributed across the Ahklun Mountains area and are independent of one another.

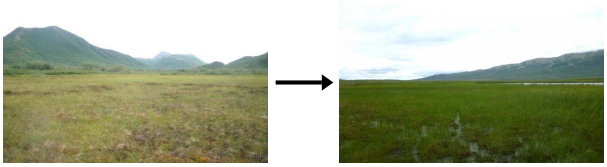
Plant functional group classifications—T = trees, S = shrubs, G = graminoids, F = forbs, B = bryophytes, L = lichens.

Canopy cover data are based on ocular estimates and rounded, except trace (0.1 percent) cover. Data ranging from 1 to 9 percent cover are rounded to the nearest integer. Data ranging from 10 to 100 percent cover are rounded to the nearest factor of 5.

Figure 9. Canopy cover and frequency of species in community 1.2.

This community is characterized as wet graminoid herbaceous (fig. 8) (Viereck et al., 1992). The major vegetative strata are medium graminoids (4 to 24 inches in height) and mosses (fig. 9). Typically, the community consists of large areas of water sedge and a mix of cottongrasses (Eriophorum spp.) and bulrushes (Trichophorum spp.) throughout. In areas of tidally influenced coastal complexes, Lyngbye's sedge (C. lyngbyei) may be present instead of water sedge. Forbs include hydrophilic species such as purple marshlocks (*Comarum palustre*), round sundew (*Drosera rotundifolia*), and buckbean (*Menyanthes trifoliata*). The ground cover commonly consists of sphagnum mosses (Sphagnum spp.), water, and herbaceous litter.

Pathway 1.1A
Community 1.1 to 1.2



Bog blueberry-bog rosemary/bulrushes-sedges/sphagnum moss (Vaccinium uliginosum-Andromeda polifolia/Trichophorum spp.-Carex spp./Sphagnum spp.)

Cottongrasses-sedges/purple marshlocks/sphagnum moss (Eriophorum spp.-Carex spp./Comarum palustre/Sphagnum spp.)

Longer, more frequent periods of ponding. Low areas are prone to longer, more frequent periods of ponding. Plants in these areas are dominantly fast-growing, obligate, wetland species.

Pathway 1.2A
Community 1.2 to 1.1

Cottongrasses-sedges/purple marshlocks/sphagnum moss (Eriophorum spp.-Carex spp./Comarum palustre/Sphagnum spp.)

Bog blueberry-bog rosemary/bulrushes-sedges/sphagnum moss (Vaccinium uliginosum-Andromeda polifolia/Trichophorum spp.-Carex spp./Sphagnum spp.)

Shorter, less frequent periods of ponding. Elevated areas are prone to shorter, less frequent periods of ponding. These drier areas are more conducive than wet areas to the growth of slow-growing, hydrophilic shrubs.

Additional community tables

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Approval

Michael Margo, 7/23/2020

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	05/10/2025
Approved by	Michael Margo
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:

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17. **Perennial plant reproductive capability:**
