

Ecological site YX244X00A102

Calcareous, Wet Arctic Mountain Slopes

Last updated: 5/28/2025

Accessed: 03/24/2026

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): 244X–Northern Brooks Range Mountains

Major Land Resource Area (MLRA) 244X includes the steep, rugged, high mountains and narrow valleys on the northern side of the Brooks Range. This remote wildland is sparsely populated and is approximately 14,525 square miles (37,615 square kilometers). The transition to the Arctic climate is the break into MLRA 244X from the surrounding subarctic MLRAs. Elevation ranges from about 1,969 feet (600 meters) to 8,570 feet (2,613 meters) at the summit of Mount Igikpak. The major rivers are the Kongakut, Aichilik, Jago, Canning, Ivishak, Ribdon, Atigun, Anaktuvuk, and Killik Rivers. They drain to the Colville River and Arctic Ocean.

Except for the highest peaks, the steep upper ridges, and some unglaciated valleys, glacial ice during the Early and Middle Pleistocene covered the MLRA. By the Late Pleistocene, only the highest valleys and mountains remained glaciated. Periglacial features (gelifluction lobes, polygons, and stripes) and fluvial deposits are common on terraces and gentle slopes. Glacial deposits overlay stratified sedimentary bedrock. This area is in the zone of continuous permafrost. Inclusions of volcanic and igneous rocks occur in the eastern part of the MLRA.

The Brooks Range is characterized by continental arctic climate. The average annual precipitation ranges from 7 to 40 inches (180 to 1,015 millimeters) with an average annual snowfall of 50 to 100 inches (125 to 255 centimeters). The average annual temperature ranges from 8 to 16 degrees Fahrenheit (-13 to -9 degrees C), with freezing temperatures possible any month of the year. Summer temperatures reach 90 to 100 degrees Fahrenheit (32 to 38 degrees Celsius), and winter temperatures drop as low as -75 degrees Fahrenheit (-60 degrees Celsius). The position of this MLRA above the Arctic

Circle lends to several days of 24-hour sunlight in June and several sunless days in December.

Freshwater is very limited due to frozen or low flow through long winters. Most domestic use water is from private wells. Aquifers are highly susceptible to contamination from surface activities (septic systems, landfills, and leaking fuel storage tanks).

The dominant soil order in this MLRA is Gelisols. The main soils are Aquiturbels, Histoturbels, Molliturbels, and Haploturbels. These are shallow or moderately deep to permafrost, poorly- to very poorly- drained, and formed in colluvium, slope alluvium, and residuum. Fibristels are shallow or moderately deep to permafrost, very poorly drained, and formed in thick deposits of organic material; in depressions, drainageways, and basins. Miscellaneous areas make up about 75 percent of this MLRA primarily composed of rubble, chutes, rock outcrops, and small glaciers. Lakes make up less than two percent of the area

Low willow, ericaceous shrub scrub, and tussocks are most dominant at lower elevations, with wet sites supporting wet meadows and willow scrub. Dwarf scrub communities (black crowberry, ericaceous shrubs, Dryas, and dwarf willow) are prominent on mountain slopes and ridges with exposed areas dominated by lichens, forbs, sedges, and mosses. As elevation and exposure increase, vegetation disappears and is replaced by rubble, talus, and other miscellaneous areas. This elevational transition is highly variable but roughly occurs at 6,500 feet (Zou et al. 2023) where glaciers also commonly prevail.

Villages use this remote area primarily for subsistence. Mining and prospecting of mineral resources historically occurred. Current disturbance relates to the pipeline and construction of Dalton highway. This disturbance of the fragile permafrost-affected soils is of increasing concern.

LRU notes

No LRUs are developed for this Major Land Resource Area (MLRA). Soils that are within this area are maintained as arctic. Soils corresponding to boreal communities are correlated to the appropriate adjacent MLRA.

Classification relationships

The Brooks Range is the most northerly extension of the Rocky Mountains occurring within the Arctic Mountains province of the Rocky Mountain System.

Description of the Ecoregions of the United States (Bailey 1983)

100 Polar Domain

120 Tundra Division

M120 Tundra Division - Mountain Provinces

M121 Brooks Range Tundra--Polar Desert Province

United States National Vegetation Classification
 C04. Polar & High Montane Scrub, Grassland & Barrens Class
 S12. Temperate to Polar Alpine & Tundra Vegetation Subclass
 F031. Polar Tundra & Barrens Formation
 D044. Arctic Tundra & Barrens Division
 M173. Feltleaf Willow - Eight-petal Mountain-avens - Tussock Cottongrass
 Tundra Macrogroup
 G896. Arctic Dwarf-shrub Tundra Group
 A4336. Arctic Nonacidic Dwarf Willow Tundra Alliance

LandFire BpS Model/Description Version: Nov. 2024
 - 16902 North American Arctic Dwarf-Shrub Lichen Tundra - Infrequent Fire

Ecological site concept

- This arctic ecological site occurs on mountain slopes and swales on mountain slopes underlain by limestone. This geology results in calcareous and alkaline soils. Non-sorted circles and stripes are common periglacial features.
- Soils formed in silty eolian deposits and colluvium weather from limestone.
- While considered very deep soils, permafrost commonly occurs at moderate deep depth (20 to 30 inches).
- Soils do not pond or flood. This ecological site is a complex of poorly and somewhat poorly drained, peat capped soils with a growing season water table at very shallow and shallow depth. Well-drained, gravelly soils occur on stripes and circles.
- Reference state vegetation is a sparse to open scrubland of dwarf-shrubs dominated by prostrate willow species, eightpetal mountain-avens, and various ericaceous shrubs.

Associated sites

YX244X00A103	Calcareous, Dry Arctic Mountain Slopes Occurs along the same calcareous formations but on comparably drier soils.
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Similar sites

YX244X00A112	Arctic Shallow Tundra Mountain Slopes Wet Arctic Mountain slopes will be similar in appearance but have a higher proportion of ericaceous shrubs and forbs, where Calcareous Wet Arctic Mountain Slopes appear drier, and have a higher abundance of mosses and lichens.
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Table 1. Dominant plant species

Tree	Not specified
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Shrub	(1) <i>Salix reticulata</i> (2) <i>Cassiope tetragona</i>
Herbaceous	(1) <i>Carex bigelowii</i> (2) <i>Carex microchaeta</i>

Legacy ID

R244XY102AK

Physiographic features

- Occurs on mountain slopes and swales on mountain slopes. Non-sorted circles and stripes are common periglacial features. The diameter of non-sorted circles commonly range from 1.5 to 10 feet and are mounded above the surrounding vegetation.
- Elevation typically ranges from about 3,400 feet along the edge of the Arctic Foothills to 6,500 feet which provisionally marks upper threshold of vegetation in this area.
- Flooding and ponding do not occur.
- A very shallow to shallow water table occurs for extended portions of the growing season (0 to 20 inches). However, non-sorted circles and stripes have no associated water table.
- Slopes commonly range from nearly level to moderately steep and occur on all aspects.
- Associated with medium to high amounts of runoff to adjacent, downslope ecological sites.

Table 2. Representative physiographic features

Slope shape across	(1) Concave
Slope shape up-down	(1) Linear
Landforms	(1) Mountain range > Mountain slope > Swale (2) Mountain range > Mountain slope (3) Mountain range > Mountain slope > Nonsorted circle (4) Mountain range > Mountain slope > Stripe
Runoff class	Medium to high
Flooding frequency	None
Ponding frequency	None
Elevation	1,036–1,981 m
Slope	2–20%
Water table depth	0–51 cm
Aspect	W, NW, N, NE, E, SE, S, SW

Table 3. Representative physiographic features (actual ranges)

Runoff class	Not specified
Flooding frequency	Not specified
Ponding frequency	Not specified
Elevation	602–2,612 m
Slope	0–45%
Water table depth	0–152 cm

Climatic features

Brief, cool summers and long, very cold winters characterize the continental arctic climate. The average annual precipitation throughout most of this area ranges from 15 to 40 inches (380 to 1,015 millimeters). The average annual snowfall is about 50 to 100 inches (125 to 255 centimeters). The average annual temperature ranges from about 8 to 16 degrees F (-13 to -9 degrees C). Freezing temperatures can occur in any month of the year. The Chandalar Shelf DOT climate station is the only station near this MLRA (Major Land Resource Area) and has incomplete data. The station is on the border of the MLRA and is not representative of the climate within MLRA 244X.

Table 4. Representative climatic features

Frost-free period (characteristic range)	20-60 days
Freeze-free period (characteristic range)	5-45 days
Precipitation total (characteristic range)	381-864 mm
Frost-free period (actual range)	
Freeze-free period (actual range)	
Precipitation total (actual range)	178-1,016 mm
Frost-free period (average)	40 days
Freeze-free period (average)	
Precipitation total (average)	

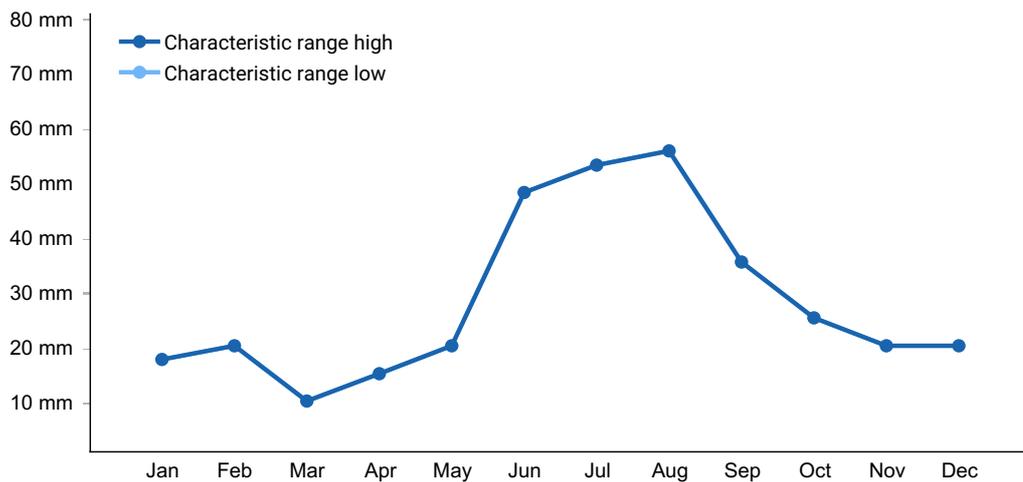


Figure 1. Monthly precipitation range

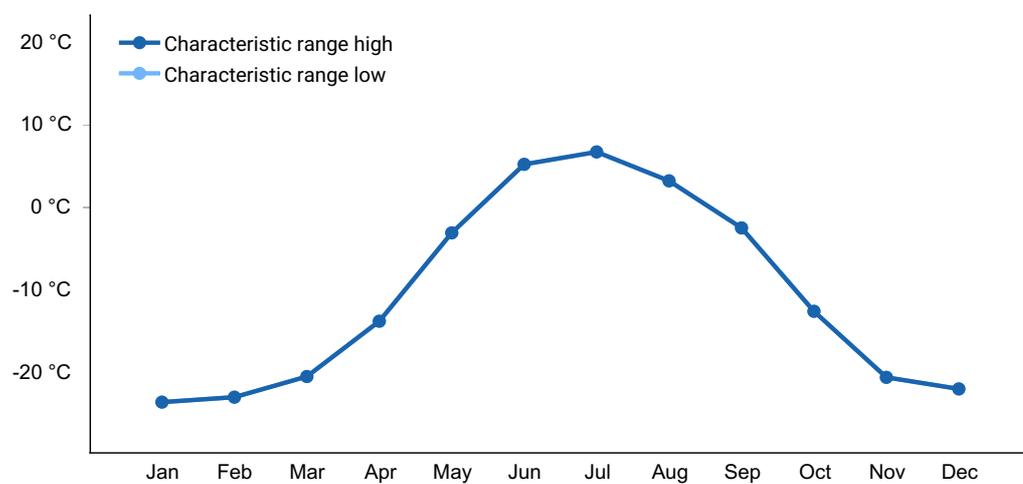


Figure 2. Monthly minimum temperature range

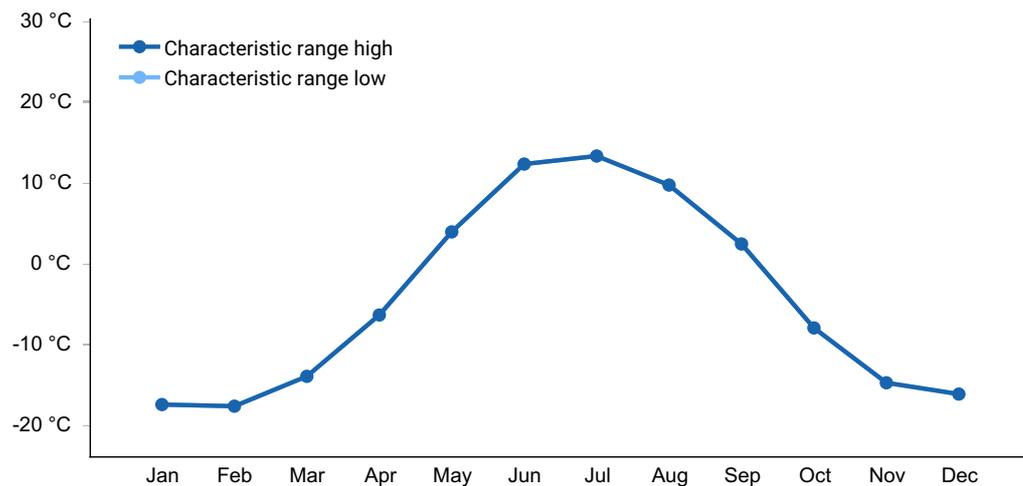


Figure 3. Monthly maximum temperature range

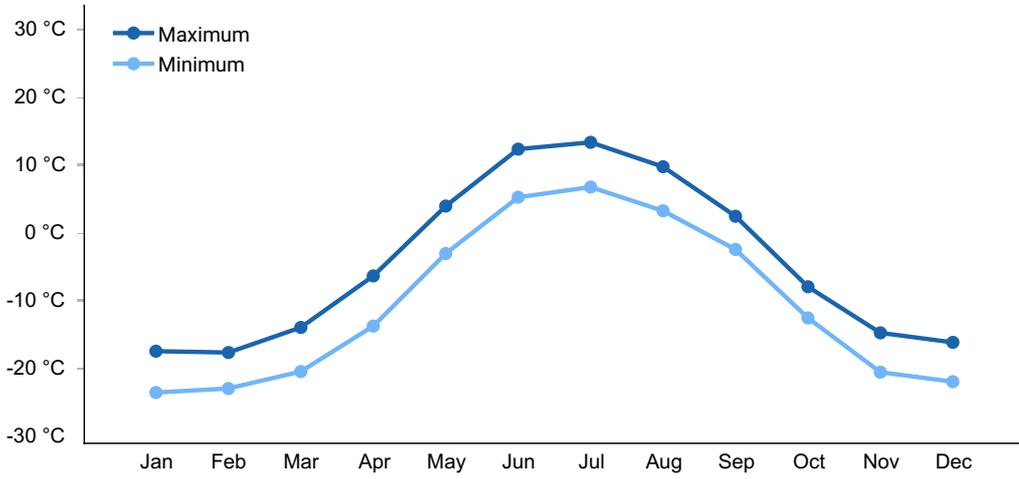


Figure 4. Monthly average minimum and maximum temperature

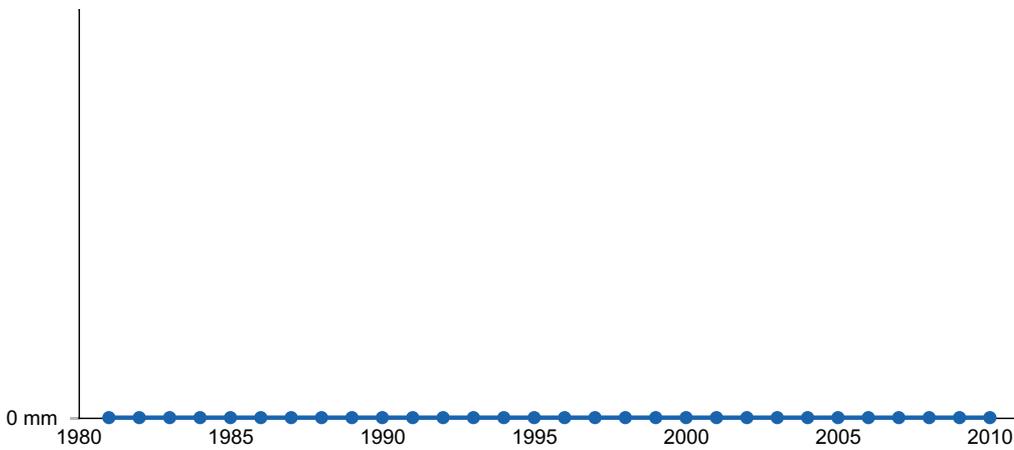


Figure 5. Annual precipitation pattern

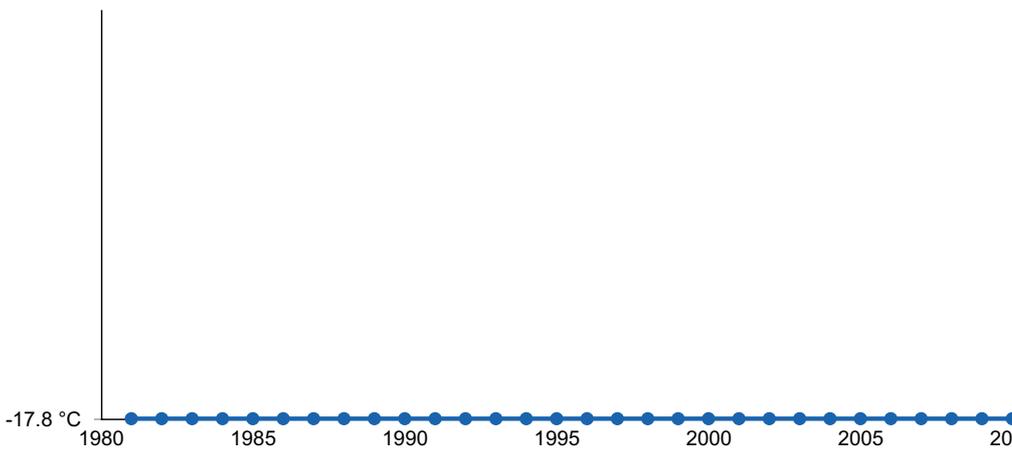


Figure 6. Annual average temperature pattern

Climate stations used

- (1) CHANDALAR SHELF DOT [USC00501497], Southerly North Slope Bo, AK

Influencing water features

Precipitation and ground water are the main sources of water (Smith et al. 1995). Snowmelt and precipitation events do increase vegetative potential, encouraging sedges, willows, and thicker organic material accumulation in these areas.

Wetland description

Within this complex, mountain slopes are commonly classified as slope wetlands under the Hydrogeomorphic (HGM) classification system (Smith et al. 1995; USDA-NRCS 2008).

Soil features

- Soils formed in silty eolian deposits and colluvium weather from limestone
- Rock fragments do not typically occur on the soil surface
- These mineral soils are capped with up to 6 inches of peat. The surface mineral horizon textures are mucky silt loam and/or very channery loam.
- Subsurface rock fragments range between 15 and 35 percent of the soil profile by volume.
- Soils are considered very deep but have permafrost at moderate depths (20 to 30 inches). The gravelly circles and stripes lack permafrost but have strongly contrasting textural stratification resulting in restrictions at very shallow to shallow depth (5 to 17 inches).
- The pH of the soil profile ranges from slightly alkaline to moderately alkaline
- Soils associated with the reference state are considered poorly to somewhat poorly drained. The associated with circles and stripes are considered well drained.

The Calcareous, Wet Arctic Mountain Slopes ecological site is correlated to four soil components: the Arctic dwarf scrub-gravelly swales, Arctic scrub-gravelly circles and stripes, Arctic scrub-sedge frozen colluvial slopes, and Arctic scrub-sedge-gravelly frozen colluvial slopes. The colluvial slope soils are classified as Gelisols in the great group Aquorthels, while the swales and circles and stripes soils are classified as Mollisols in the great group Haplogelolls.

This Major Land Resource Area (MLRA) is remote and difficult to reach and has not had soil verification completed. The information was obtained using the STATSGO soils information, a class 5 soils product. When opportunity presents to collect data in this MLRA, this Provisional Ecological Site will be updated.

Table 5. Representative soil features

Parent material	<ul style="list-style-type: none"> (1) Organic material (2) Eolian deposits (3) Colluvium–limestone (4) Colluvium–interbedded sedimentary rock
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Surface texture	(1) Mucky silt loam (2) Very channery loam
Drainage class	Poorly drained to somewhat poorly drained
Permeability class	Moderately rapid
Depth to restrictive layer	51–76 cm
Soil depth	152 cm
Surface fragment cover ≤3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	6.1–7.62 cm
Soil reaction (1:1 water) (25.4-101.6cm)	7.4–8.4
Subsurface fragment volume ≤3" (0-152.4cm)	9–21%
Subsurface fragment volume >3" (0-152.4cm)	5–13%

Table 6. Representative soil features (actual values)

Drainage class	Somewhat poorly drained to well drained
Permeability class	Moderately rapid to rapid
Depth to restrictive layer	13–76 cm
Soil depth	Not specified
Surface fragment cover ≤3"	0–45%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	6.1–13.97 cm
Soil reaction (1:1 water) (25.4-101.6cm)	5.6–8.4
Subsurface fragment volume ≤3" (0-152.4cm)	3–47%
Subsurface fragment volume >3" (0-152.4cm)	0–53%

Ecological dynamics

The Calcareous, Wet Arctic Mountain Slopes ecological site is dominated by dwarf willow shrubs and is found on the exposed, concave sites in the arctic Brooks Range. The sparse

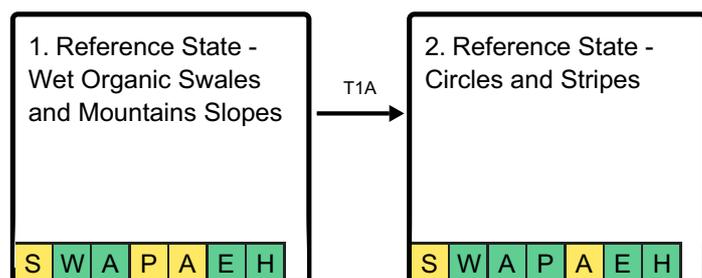
to open scrubland is dominated by prostrate willow species primarily being *Salix reticulata* and *Salix rotundifolia*. Other common dwarf-shrubs include *Dryas octopetala* and *Cassiope tetragona*. Erect shrubs such as *Salix pulchra* are constant at low cover. Graminoids (*Carex bigelowii* and *Arctagrostis latifolia*), forb (*Petasites frigidus*), and lichens (*Flavocetraria cucullata* and *Thamnolia vermicularis*) have high constancy.

Other common species include forbs such as *Tephroses atropurpurea* ssp. *frigida* and *Polygonum bistorta* var. *plumosum*, graminoids including *Eriophorum angustifolium*, *Eriophorum vaginatum*, *Luzula confusa*, and *Luzula arctica*, horsetail (*Equisetum arvense*), and bryophytes. Mosses include *Tomentypnum nitens*, *Hylocomium splendens*, *Aulacomnium* spp. and *Dicranum* spp.

This ecological site is stable in current conditions. As snowpack shifts and the potential for travel through the area increases, the organic layer and permafrost stability may be affected. Changes in depth of organic layer (protection) or drainage (subsidence or change in wetness of site) are likely drivers of successional change.

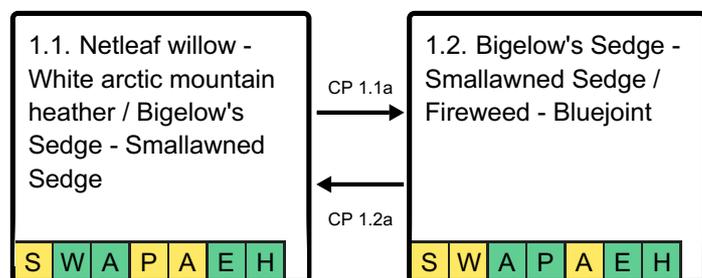
State and transition model

Ecosystem states



T1A - Increased cryoturbation and time - non-feasible due to time scale controlled

State 1 submodel, plant communities



CP 1.1a - Fire (rare occurrence)

CP 1.2a - Time

State 2 submodel, plant communities

2.1. Mountain Avens-
Mountain
Heather/Alpine
Sweetgrass-Spike
Trisetum

State 1

Reference State - Wet Organic Swales and Mountains Slopes

The reference state has plant communities representative of the native or natural conditions. Minimal impact from human influence is seen. The somewhat stable swales are tolerant of wildlife browse and use. Fire is stated to be of infrequent occurrence, but will have an impact when it does occur, shifting the major cover. Vegetation will vary across the area based on where late-lying snow and the most exposed soils occur on the ecological site. This natural variance is common across the peat, or organic soils on the side slopes. This state supports late lying snow beds. This ecological site has subsurface moisture, but the harsh climate and exposure create a mesic climate. Across the landscape, as exposure increases to the winds, little snow cover remains, and lichen cover is low. But in areas with higher snow cover, the lichen will vary and can account for 25 percent of cover (Viereck et al. 1992).

Dominant plant species

- white arctic mountain heather (*Cassiope tetragona*), shrub
- black crowberry (*Empetrum nigrum*), shrub
- bog blueberry (*Vaccinium uliginosum*), shrub
- netleaf willow (*Salix reticulata*), shrub
- alpine sweetgrass (*Anthoxanthum monticola*), grass
- smallawned sedge (*Carex microchaeta*), grass
- northern singlespike sedge (*Carex scirpoidea*), grass
- Richardson's brookfoam (*Boykinia richardsonii*), other herbaceous
- glacier avens (*Geum glaciale*), other herbaceous
- woolly lousewort (*Pedicularis lanata*), other herbaceous

Dominant resource concerns

- Subsidence
- Organic matter depletion
- Plant structure and composition
- Terrestrial habitat for wildlife and invertebrates

Community 1.1

Netleaf willow - White arctic mountain heather / Bigelow's Sedge -

Smallawned Sedge

The Reference Plant Community is dominated by sub-shrubs, with lichen cover of up to 25 percent, exceeding in exposed areas. Sedges are common in the community and other grasses and forbs are highly variable. The herbaceous cover will be as high as 75 percent in the wetter, more protected areas of the community. The prominent dwarf scrub species are white arctic mountain heather (*Cassiope tetragona*), black crowberry (*Empetrum nigrum*), bog blueberry (*Vaccinium uliginosum*), net-leaf willow (*Salix reticulata*), arctic willow (*Salix arctica*), roundleaf willow (*Salix rotundifolia*), and alpine bearberry (*Arctostaphylos alpina*). A smaller composition of dwarf shrubs is comprised of dwarf birch (*Betula nana*), eightpetal mountain avens (*Dryas octopetala*), entireleaf mountain avens (*Dryas integrifolia*), marsh labrador tea (*Ledum palustre* ssp. *decumbens*), alpine azalea (*Loiseleuria procumbens*), lingonberry (*Vaccinium vitis-idaea*), skeletonleaf willow (*Salix phlebophylla*), purple mountain saxifrage (*Saxifraga oppositifolia*), lapland rosebay (*Rhododendron lapponicum*), and red fruit bearberry (*Arctostaphylos rubra*). Common herbaceous species include alpine sweetgrass (*Anthoxanthum monticola* ssp. *alpinum*), smallawned sedge (*Carex microchaeta*), Northern singlespike sedge (*Carex scirpoidea*), tall cottongrass (*Eriophorum angustifolium* ssp. *triste*), and Altai fescue (*Festuca altaica*). Forbs and other herbaceous species include Richardson's brookfoam (*Boykinia richardsonii*), glacier avens (*Geum glaciale*), woolly lousewort (*Pedicularis lanata*), horsetail (*Equisetum* spp.), and alpine pussytoes (*Antennaria alpina*). Ground cover includes a diversity of mosses, however, the ground cover is minimal in comparison. The most common are rhytidium moss (*Rhytidium rugosum*), turgid aulacomnium moss (*Aulacomnium turgidum*), distichium moss (*Distichium capillaceum*), racomitrium moss (*Racomitrium lanuginosum*), elongate dicranum moss (*Dicranum elongatum*), and polytrichum moss (*Polytrichum* spp.) (Viereck et al. 1992). The calcareous limestone that supports this plant community favors several lichens including curled snow lichen (*Flavocetraria cucullata*), snow lichens (*Flavocetraria* spp. and *Stereocaulon* spp.), witch's hair lichen (*Alectoria nigricans*), and whiteworm lichen (*Thamnolia vermicularis*).

Dominant and Indicator Species Symbol	Scientific Name	Common Name
CATE11	<i>Cassiope tetragona</i>	White arctic mountain heather
EMNI	<i>Empetrum nigrum</i>	Black crowberry
VAUL	<i>Vaccinium uliginosum</i>	Bog blueberry
SALIX	<i>Salix</i> spp.	Willow
ARAL2	<i>Arctostaphylos alpina</i>	Alpine bearberry
BENA	<i>Betula nana</i>	Dwarf birch
CABI5	<i>Carex bigelowii</i>	Bigelow's sedge
CAMI4	<i>Carex microchaeta</i>	Smallawned sedge

Dominant plant species

- least willow (*Salix rotundifolia*), shrub
- netleaf willow (*Salix reticulata*), shrub
- white arctic mountain heather (*Cassiope tetragona*), shrub
- black crowberry (*Empetrum nigrum*), shrub
- bog blueberry (*Vaccinium uliginosum*), shrub
- Bigelow's sedge (*Carex bigelowii*), grass
- smallawned sedge (*Carex microchaeta*), grass
- alpine sweetgrass (*Anthoxanthum monticola* ssp. *alpinum*), grass
- Richardson's brookfoam (*Boykinia richardsonii*), other herbaceous

- glacier avens (*Geum glaciale*), other herbaceous
- woolly lousewort (*Pedicularis lanata*), other herbaceous

Dominant resource concerns

- Subsidence
- Plant productivity and health
- Terrestrial habitat for wildlife and invertebrates

Community 1.2

Bigelow's Sedge - Smallawned Sedge / Fireweed - Bluejoint

Following a fire, the first cover that will occur are sedges (*Carex* spp.) and a group of bryophytes including polytrichum moss (*Polytrichum* spp.), ceratodon moss (*Ceratodon purpureus*), and umbrella liverwort (*Marchantia polymorpha*) (Racine et al. 2004). Dwarf shrubs will begin to gain dominance within 24 years following post fire (Racine et al. 2004). Low shrubs will recover within this same time frame, but will decrease in cover, accounting for less than 25 percent of the community. (*Vaccinium*), willow (*Salix*), bearberry (*Arctostaphylos*), and labrador tea (*Ledum* spp.) are more resilient and will regain their composition. Black crowberry (*Empetrum nigrum*) however suffers a greater disturbance and is slow to recover. The shallow rhizomes are more susceptible to moderate and high severity fire.

Symbol	Scientific Name	Common Name	Canopy Position	CABI5
	<i>Carex bigelowii</i>	Bigelow's sedge	Upper	CAMI4
	<i>Carex microchaeta</i>	Smallawned sedge	Upper	CHANA2
	<i>Chamerion angustifolium</i> ssp. <i>angustifolium</i>	Fireweed	Upper	CACA4
	<i>Calamagrostis canadensis</i>	Bluejoint	Upper	

Dominant plant species

- bog blueberry (*Vaccinium uliginosum*), shrub
- marsh Labrador tea (*Ledum palustre* ssp. *decumbens*), shrub
- alpine bearberry (*Arctostaphylos alpina*), shrub
- Bigelow's sedge (*Carex bigelowii*), grass
- smallawned sedge (*Carex microchaeta*), grass
- bluejoint (*Calamagrostis canadensis*), grass
- fireweed (*Chamerion angustifolium* ssp. *angustifolium*), other herbaceous
- glacier avens (*Geum glaciale*), other herbaceous
- woolly lousewort (*Pedicularis lanata*), other herbaceous

Dominant resource concerns

- Subsidence
- Drifted Snow
- Terrestrial habitat for wildlife and invertebrates

Pathway CP 1.1a

Community 1.1 to 1.2

An occurrence of fire, although rare, will reduce the dwarf and low-lying shrubs from the community. It is identified that this shrub component can be recaptured within 20 to 25 years (Racine et al. 2004).

Pathway CP 1.2a

Community 1.2 to 1.1

Given time, the dwarf and low-lying shrubs of this community will return but will be slightly reduced in cover. The lichen and sedge cover will decrease over time but still hold a higher cover than pre-fire.

State 2

Reference State - Circles and Stripes

The Circles and Stripes State is again thought to be in reference due to the minimal threat to disturbance. Cryoturbation is the major disturbance for this State. Original formation occurred over centuries to thousands of years ago.

Dominant plant species

- eightpetal mountain-avens (*Dryas octopetala*), shrub
- white arctic mountain heather (*Cassiope tetragona*), shrub
- alpine bearberry (*Arctostaphylos alpina*), shrub
- alpine sweetgrass (*Anthoxanthum monticola* ssp. *alpinum*), grass
- spike trisetum (*Trisetum spicatum*), grass
- smallawned sedge (*Carex microchaeta*), grass
- alpine bistort (*Polygonum viviparum*), other herbaceous
- longpod stitchwort (*Minuartia macrocarpa*), other herbaceous
- twinflower sandwort (*Minuartia obtusiloba*), other herbaceous

Dominant resource concerns

- Subsidence
- Terrestrial habitat for wildlife and invertebrates

Community 2.1

Mountain Avens-Mountain Heather/Alpine Sweetgrass-Spike Trisetum

This system is co-dominated by sedges and dwarf-shrubs. Mountain Avens (*Dryas* spp.) cover is approximately 10 to 15 percent, and total dwarf-shrub cover varies with the pH and the soil moisture of the ecological site, ranging from 15 to 30 percent cover. The plant community typically includes Eightpetal Mountain Avens (*Dryas octopetala*) is common on rocky substrate on summits, shoulders, and ridges in the mountains and hills. Arctic white mountain heather (*Cassiope tetragona*), arctic bearberry (*Arctostaphylos alpina*), net-leaved willow (*Salix reticulata*), and skeleton-leaf willow (*Salix phlebophylla*). Other low-

lying cover will vary with extent of exposure, proximity to the edge of the swale, and rock boil present. The common grasses and grass-like are alpine sweetgrass (*Anthoxanthum monticola* ssp. *alpinum*), spike trisetum (*Trisetum spicatum*), small-awned sedge (*Carex microchaeta*), and Northern single-spike sedge (*Carex scirpoidea*). Forbs such as alpine bistort (*Polygonum viviparum*), longpod stitchwort (*Minuartia macrocarpa*), twinflower sandwort (*Minuartia obtusiloba*), anemone (Anemone spp.), and heartleaf saxifrage (*Saxifraga nelsoniana*) are common on this ecological site. The calcareous substrate is indicated by a higher presence of lapland rosebay (*Rhododendron lapponicum*), purple mountain saxifrage (*Saxifraga oppositifolia*), oneflowered cinquefoil (*Potentilla uniflora*), Northern sweetvetch (*Hedysarum boreale* ssp. *mackenziei*), blackish oxytrope (*Oxytropis nigrescens*), and tortula moss (*Tortula ruralis*). Mosses and lichens are a component of this community. Polytrichum moss (Polytrichum spp.) and racomitrium moss (*Racomitrium lanuginosum*) are the two prominent moss cover on the ecological site. Lichens have a slightly higher diversity and notable. The common lichens noted are whiteworm lichen (*Thamnolia vermicularis*), snow lichen (Stereocaulon spp.), bryocaulon lichen (*Bryocaulon divergens*), witch's hair lichen (Alectoria spp.), island cetraria lichen (*Cetraria islandica*), and curled snow lichen (Flavocetraria cucullate).

Transition T1A

State 1 to 2

Shift in extent of fluctuating temperatures may accelerate the formation of stone circles or patterned ground. This is in response to increased frost heaving (cryoturbation), especially in southern exposed and more exposed areas, and may be an effect of climate change. These features are natural occurrence in the arctic region and closely associated with the wet swales.

Context dependence. The time scale for the formation of stone circles is thousands of years. Signs of this process is evident in small events throughout a decadal time scale but are not visible in a functional time scale.

Additional community tables

Animal community

The Brooks Range is an important big-game area in Alaska. Mammals common to the area include brown bear, black bear, wolf, caribou, and Dall sheep. The smaller mammals include marmot, red fox, Arctic fox, wolverine, ground squirrel, lemming, and pika. The Brooks Range is an important resting area for migrating waterfowl and songbirds during summer. Raptors prominent in many areas include golden eagles, marsh hawks, gyrfalcons, and snowy and other open country owls.

Hydrological functions

Overland water seepage and subsurface water seepage from snowmelt and precipitation

events supports enhanced vegetation in these concave positions. Otherwise, there is no active connection to ground water or channel hydraulics.

Recreational uses

This remote area is used for sport hunting and other kinds of wildland recreation. Visitors use air taxi, guiding, and outfitting companies operating out of the major Alaska communities.

Wood products

Wooded areas reside just outside of the MLRA.

Other products

This remote area is primarily used for subsistence hunting, fishing, and gathering.

Inventory data references

No on-site data are available. Information used to build this ecological site was obtained from existing land cover and vegetation maps, literature review, and vegetative summaries from partnering agencies.

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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	03/24/2026
Approved by	Blaine Spellman
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:
