USDA Natural Resources Conservation Service

Ecological site R231XY164AK
Subalpine Scrub Gravelly Slopes Dry

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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): 231X–Interior Alaska Highlands

The Interior Alaska Uplands (MLRA 231X) is in the Interior Region of Alaska and includes the extensive hills, mountains, and valleys between the Tanana River to the south and the Brooks Range to the north. These hills and mountains surround the Yukon Flats Lowlands (MLRA 232X). MLRA 231X makes up about 69,175 square miles. The hills and mountains of the area tend to be moderately steep to steep resulting in high-relief slopes. The mountains are generally rounded at lower elevations and sharp-ridged at higher elevations. Elevation ranges from about 400 feet in the west, along the boundary with the Interior Alaska Lowlands (MLRA 229X), to 6,583 feet at the summit of Mt. Harper, in the southeast. Major tributaries include large sections of the Yukon, Koyukuk, Kanuti, Charley, Coleen, and Chatanika Rivers. This area is traversed by several major roads, including the Taylor Highway in the east and the Steese, Elliott, and Dalton Highways north of Fairbanks. The area is mostly undeveloped wild land that is sparsely populated. The largest community along the road system is Fairbanks with smaller communities like Alatna, Allakaket, Chicken, Eagle, Eagle Village, Hughes, and Rampart occurring along the previously mentioned rivers and highways.

The vast majority of this MLRA was unglaciated during the Pleistocene epoch with the exceptions being the highest mountains and where glaciers extended into the area from the Brooks Range. For the most part, glacial moraines and drift are limited to the upper elevations of the highest mountains. Most of the landscape is mantled with bedrock colluvium originating from the underlying bedrock. Valley bottoms are filled with Holocene fluvial deposits and colluvium from the adjacent mountain slopes. Silty loess, which originated from unvegetated flood plains in and adjacent to this area, covers much of the surface. On hill and mountain slopes proximal to major river valleys (e.g., Tanana and Yukon Rivers), the loess is many feet thick. As elevation and distance from major river valleys increases, loess thickness decreases significantly. Bedrock is commonly exposed on the highest ridges.

This area is in the zone of discontinuous permafrost. Permafrost commonly is close to the surface in areas of the finer textured sediments throughout the MLRA. Isolated masses of ground ice occur in thick deposits of loess on terraces and the lower side slopes of hills. Solifluction lobes, frost boils, and circles and stripes are periglacial features common on mountain slopes in this area. Pingos, thermokarst pits and mounds, ice-wedge polygons, and earth hummocks are periglacial features common on terraces, lower slopes of hills and mountains, and in upland valleys in the area.

The dominant soil orders in this area are Gelisols, Inceptisols, Spodosols, and Entisols. The soils in the area have a subgelic or cryic soil temperature regime, an aquic or udic soil moisture regime, and mixed mineralogy. Gelisols are common on north facing slopes, south facing footslopes, valley bottoms, and stream terraces. Gelisols are typically shallow or moderately deep to permafrost (10 to 40 inches) and are poorly or very poorly drained. Wildfires can disturb the insulating organic material at the surface, lowering the permafrost layer, eliminating perched water tables from Gelisols, and thus changing the soil classification. Inceptisols and Spodosols commonly form on south facing hill and mountain slopes. Entisols are common on flood plains and high elevation mountain slopes. Miscellaneous (non-soil) areas make up about 2 percent of this MLRA. The most common miscellaneous areas are rock outcrop and rubble land. In many valleys placer mine tailings are common.

Short, warm summers and long, cold winters characterize the subarctic continental climate of the area. The mean annual temperature of the area ranges from 22 to 27 degrees F. The mean annual temperature of the southern half of the area is approximately 3 degrees warmer compared to the northern half (PRISM 2018). The warmest months span June through August with mean monthly temperatures ranging from 50 to 56 degrees F. The coldest months span November through February with mean monthly temperatures ranging from -5 to 3 degrees F. When compared to the high-elevation alpine and subalpine life zones, the lower elevation boreal life zone tends to be 2-3 degrees F colder during the coldest months and 1-2 degrees F warmer during the warmest months (PRISM 2018). The freeze-free period at the lower elevations averages about 60 to 100 days, and the temperature usually remains above freezing from June through mid-September.

Precipitation is limited across this area, with the average annual precipitation ranging from 12 to 19 inches. The southern half of the areas receives approximately 2.5 inches more annual precipitation then the northern half (PRISM 2018). The lower elevation boreal life zone receives approximately 2.5 inches less annual precipitation than the high-elevation alpine and subalpine life zones (PRISM 2018). Approximately 3/5th of the annual precipitation occurs during the months of June through September with thunderstorms being common. The average annual snowfall ranges from about 45 to 100 inches. The ground is consistently covered with snow from November through March.

Most of this area is forested below an elevation of about 2500 feet. Dominant tree species on slopes are white spruce and black spruce. Black spruce stands are most common on north-facing slopes, stream terraces, and other sites with poor drainage and permafrost. White spruce stands are most common on warm slopes with dry soils. At lower elevations, lightning-caused wildfires are common, often burning many thousands of acres during a single fire. Following wildfires, forbs, grasses, willow, ericaceous shrubs, paper birch, and quacking aspen communities are common until they are eventually replaced by stands of spruce. Tall willow and alder scrub is extensive on low flood plains. White spruce and balsam poplar are common on high flood plains.

With increasing elevation, the forests and woodlands give way to subalpine communities dominated by krummholz spruce, shrub birch, willow, and ericaceous shrubs. At even higher elevations, alpine communities prevail which are characterized by diverse forbs, dwarf ericaceous shrubs, and eightpetal mountain-avens. Many of these high elevation communities have a considerable amount of lichen cover and bare ground.

LRU notes

This area supports three life zones defined by the physiological limits of plant communities along an elevational gradient: boreal, subalpine, and alpine. The boreal life zone is the elevational band where forest communities dominate. Not all areas in the boreal life zone are forest communities, however, particularly in places with too wet or dry soil to support tree growth (e.g., bogs or river bluffs). Above the boreal band of elevation, subalpine and alpine vegetation dominate. The subalpine zone is typically a narrow transitional band between the boreal and the alpine life zones, and is characterized by sparse, stunted trees. In the subalpine, certain types of birch and willow shrub species grow at ≥ 1 m in height (commonly *Betula glandulosa* and Salix pulchra). In the alpine, trees no longer occur, and all shrubs are dwarf or lay prostrate on the ground. In this area, the boreal life zone occurs below 2500 feet elevation on average. The transition between boreal and alpine vegetation can occur within a range of elevations, and is highly dependent on slope, aspect, and shading from adjacent mountains.

Within each life zone, there are plant assemblages that are typically associated with cold slopes and warms slopes. Cold slopes and warm slopes are created by the combination of the steepness of the slope, the aspect, and shading from surrounding ridges and mountains. Warm slope positions typically occur on southeast to west facing slopes that are moderate to very steep (>10% slope) and are not shaded by the surrounding landscape. Cold slopes typically occur on northwest to east facing slopes, occur in shaded slope positions, or occur in low-lying areas that are cold air sinks. Examples of shaded positions include head slopes, low relief backslopes of hills, and the base of hills and mountains shaded by adjacent mountain peaks. Warm boreal slope soils have a cryic soil temperature regime and lack permafrost. In this area, white spruce forests are an indicator of warm boreal slopes. Cold boreal slope soils typically have a gelic soil temperature regime and commonly have permafrost. In this area, black spruce forests and woodlands are an indicator of cold boreal slopes. The boreal life zone can occur at higher elevations on warm slopes, and lower elevations on cold slopes.

Classification relationships

Landfire BPS – 7416011 – Western North American Boreal Treeline White Spruce Woodland - Boreal

Ecological site concept

This subalpine site occurs on warm slopes with gravelly soils that do not have permafrost. This site is associated with backslopes, shoulders, and summits of hills and mountains at high elevation. The soils lack permafrost, do not have a water table during the growing season, and are generally considered well drained. The soils formed in silty loess and gravelly colluvium and/or residuum. Soils with residuum commonly contact bedrock at moderate to deep depths.

This site occurs at high elevation and has a harsh climate that limits growth of vegetation and prevents the establishment of many species common to the boreal life zone. The unique vegetation associated with this site is the result of high winds, a short growing season, deep and persistent snow beds, and cold soils. These climatic factors prevent the establishment and growth of many dominant boreal species like white spruce and black spruce.

Two plant communities occur within the reference state and the vegetation in each community differs in large part due to fire. When the reference state vegetation burns, the post-fire plant community is dominantly graminoids, forbs, and weedy mosses. With time and lack of another fire event, the post-fire vegetation goes through succession. For this site, the reference plant community is the most stable with the longest time since the vegetation was burned. This community is typically characterized as closed low scrub (Viereck et al. 1992).

For the reference plant community, krummholz white spruce is common but typically have limited cover. Scrub birch is the dominant overstory plant. Other common species include bog blueberry, bog Labrador tea, marsh Labrador tea, crowberry, lingonberry, various reindeer lichen, Schreber's big red stem moss, and splendid feathermoss. The vegetative strata that characterize this community are medium shrubs (between 3 and 10 feet), low shrubs (between 8 and 36 inches), foliose and fruticose lichen, and mosses.

Associated sites

R231XY101AK	**Alpine dwarf scrub gravelly slopes** Occurs upslope on dry soils in the alpine.
R231XY152AK	**High-elevation scrub gravelly drainageways** Occurs downslope in high elevation drainageways.
F231XY182AK	**Boreal Forest Gravelly Slopes** Occurs downslope on similar soils in the boreal life zone.
F231XY184AK	**Subalpine Forest Gravelly Moist Slopes** Occurs in the subalpine on protected slopes with moist and gravelly soils.
R231XY185AK	**Subalpine Scrub Loamy Frozen Footslopes** Occurs downslope at the base of hills and mountains in the subalpine.

Similar sites

R231XY101AK	**Alpine dwarf scrub gravelly slopes** This site occurs in the alpine life zone. At times, scrub birch and bog blueberry can be dominant plants. However, in the alpine shrubs grow low or lay prostrate on the ground.
F231XY180AK	**Boreal Woodland Gravelly Slopes Dry** This site occurs in the boreal life zone. Site 164 and 180 share similar vegetation but site 180 has more productive white spruce and forested stands.
F231XY182AK	**Boreal Forest Gravelly Slopes** This site occurs in the boreal life zone. Site 164 and 182 share similar vegetation but site 182 has more productive white spruce and forested stands.
R231XY185AK	**Subalpine Scrub Loamy Frozen Footslopes** Site 185 has similar shrub dominant communities but has much wetter soils. These differences in soils result in different kinds and amounts of vegetation.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Betula glandulosa* (2) *Vaccinium uliginosum*
Herbaceous	(1) *Pleurozium schreberi* (2) *Hylocomium splendens*

Physiographic features

This subalpine site typically occurs on the shoulders and backslopes of mountains at high elevation. On occasion, the site occurs on hills, terraces, and plains. Elevation typically ranges between 2500 and 3100 feet but can go as low as 1900 feet on some windswept hill summits and as high as 4275 feet on steep southerly slopes. Associated shoulders are strongly sloping while backslopes are steep with slope on both landform positions commonly ranging between 5 and 40 percent or more. This site most often occurs on warm slopes that are southeast to west facing. Flooding and ponding do not occur and there is typically no high-water table in the soil profile. This site generates low to medium amounts of runoff to adjacent, downslope sites.

Table 2. Representative physiographic features

Hillslope profile	(1) Summit (2) Shoulder (3) Backslope
Landforms	(1) Mountains > Mountain slope (2) Mountains > Hill (3) Upland > Plain (4) Mountains > Terrace
Runoff class	Low to medium
Flooding frequency	None
Ponding frequency	None
Elevation	2,500–3,100 ft
Slope	5–40%
Water table depth	60 in
Aspect	W, SE, S, SW

Table 3. Representative physiographic features (actual ranges)

Runoff class	Not specified
Flooding frequency	Not specified
Ponding frequency	Not specified
Elevation	1,900–4,275 ft
Slope	0–70%
Water table depth	40 in

Climatic features

When compared to the boreal life zone, this high-elevation site has a harsh climate. In this MLRA, snow first blankets and persists the longest in the alpine and subalpine life zones. From spring through fall (April through September) , it is consistently 1 to 2 degrees F colder in the alpine and subalpine. These small differences in temperature are exacerbated due to constant and strong winds. Winds are much more intense in these high elevation areas because of limited trees providing windbreaks. When compared to the boreal life zone, this site has a much shorter growing season and the growing season is significantly colder for associated vegetation.

Short, warm summers and long, cold winters characterize the subarctic continental climate associated with this high-elevation site. The mean annual temperature of the site ranges from 23 to 27 degrees F. The warmest months span June through August with mean normal maximum monthly temperatures ranging from 57 to 63 degrees F. The coldest months span November through February with mean normal minimum temperatures ranging from -9 to -1 degrees F. The freeze-free period for the site ranges from 80 to 120 days, and the temperature usually remains above freezing from late May through mid-September.

The area receives minimal annual precipitation with the summer months being the wettest. Average annual precipitation in the alpine across the area typically ranges between 14 to 21 inches. Approximately 3/5th of the annual precipitation occurs during the months of June through September with thunderstorms common. The average annual snowfall ranges from about 45 to 100 inches. The ground is consistently covered with snow from mid-October through March.

Table 4. Representative climatic features

Frost-free period (characteristic range)	16-78 days
Freeze-free period (characteristic range)	76-114 days
Precipitation total (characteristic range)	14-21 in
Frost-free period (actual range)	4-87 days
Freeze-free period (actual range)	48-120 days
Precipitation total (actual range)	10-25 in
Frost-free period (average)	53 days
Freeze-free period (average)	90 days
Precipitation total (average)	17 in

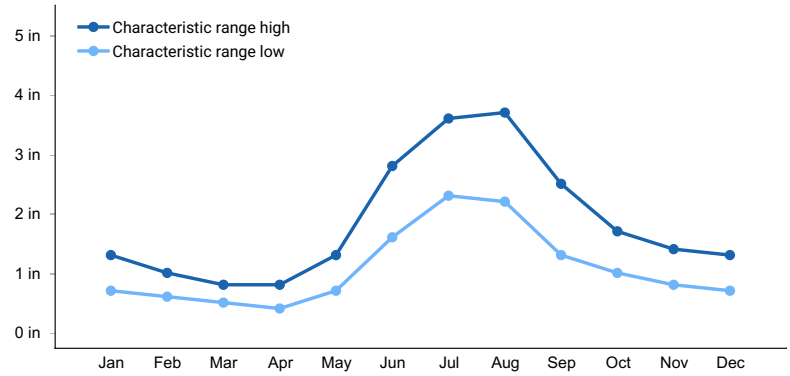


Figure 1. Monthly precipitation range

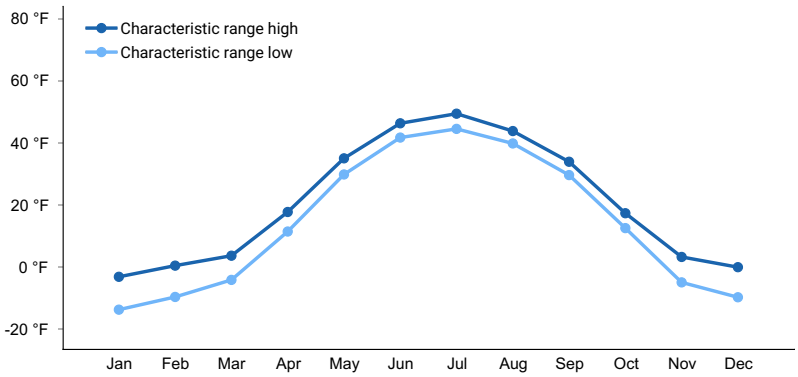


Figure 2. Monthly minimum temperature range

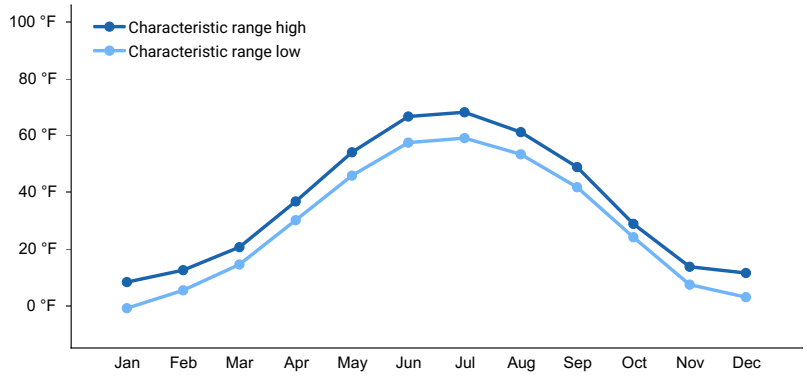


Figure 3. Monthly maximum temperature range

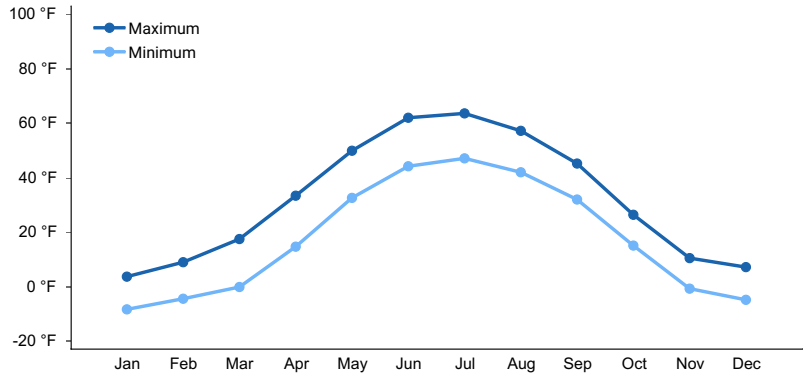


Figure 4. Monthly average minimum and maximum temperature

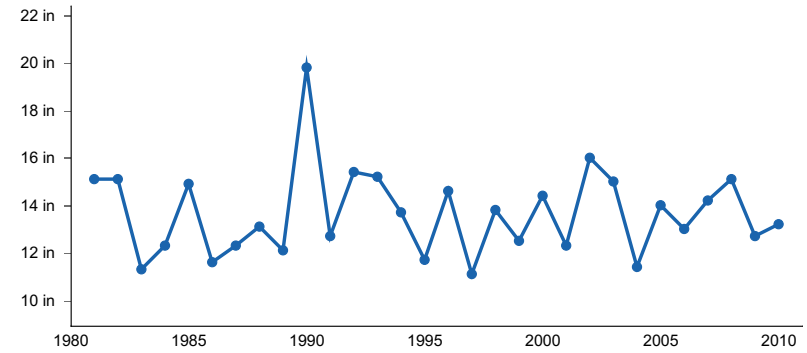


Figure 5. Annual precipitation pattern

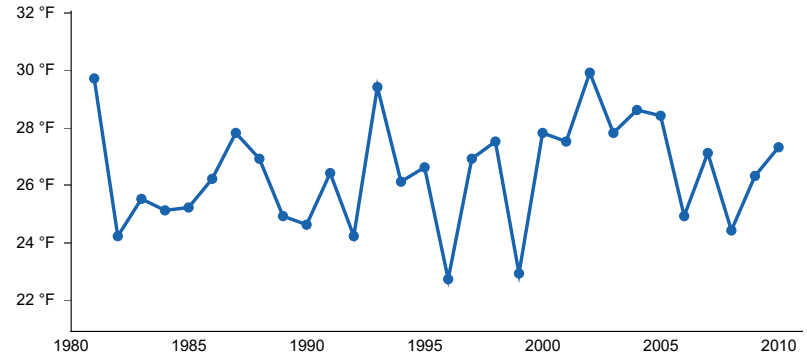


Figure 6. Annual average temperature pattern

Climate stations used

- (1) EAGLE AP [USW00026422], Tok, AK
- (2) CHICKEN [USC00501684], Tok, AK
- (3) MILE 42 STEESE [USC00505880], Fairbanks, AK

- (4) BETTLES AP [USW00026533], Bettles Field, AK
- (5) CIRCLE HOT SPRINGS [USC00501987], Central, AK
- (6) FT KNOX MINE [USC00503160], Fairbanks, AK
- (7) GILMORE CREEK [USC00503275], Fairbanks, AK
- (8) FOX 2SE [USC00503181], Fairbanks, AK
- (9) ESTER DOME [USC00502868], Fairbanks, AK
- (10) ESTER 5NE [USC00502871], Fairbanks, AK
- (11) COLLEGE 5 NW [USC00502112], Fairbanks, AK
- (12) COLLEGE OBSY [USC00502107], Fairbanks, AK
- (13) KEYSTONE RIDGE [USC00504621], Fairbanks, AK

Influencing water features

Due to its landscape position, this site is neither associated with or influenced by streams or wetlands. Precipitation and throughflow are the main source of water for this ecological site. Surface runoff and throughflow contribute some water to downslope ecological sites.

Wetland description

n/a

Soil features

Soils formed in windblown silts over gravelly parent material and do not have permafrost. Surface rock fragments are not typically present but on certain high elevation slopes can range up to 55 percent cover. These are mineral soils often capped with 2 to 5 inches of organic material. The mineral soil below the organic material is a silt loam formed from wind-blown loess, which is commonly mixed with some rock fragments and has higher water holding capacity. The thickness of this loess layer is highly variable ranging from 0 to 20 inches or more. Below the silty parent material is gravelly colluvium or residuum with rock fragments ranging between 20 and 60 percent of the soil profile by volume and has less water holding capacity. Soils are typically very deep without restrictions. At times, soils with extremely gravelly colluvium have strongly contrasting textural stratification causing restrictions at very shallow depths (between 1 and 5 inches) and soils with residuum can contact bedrock at shallow to moderate depths (between 19 and 34 inches). The pH of the soil profile often ranges from very strongly acidic to moderately acidic. The soils are dry throughout the growing season and are typically well drained.

Figure 7. A typical soil profile associated with this site.

Figure 8. Associated soils with a silty loess layer over gravelly parent material.

Table 5. Representative soil features

Parent material	(1) Loess (2) Eolian deposits (3) Colluvium (4) Residuum
Surface texture	(1) Silt loam (2) Gravelly silt loam (3) Channery silt loam
Family particle size	(1) Loamy-skeletal (2) Coarse-loamy (3) Fragmental
Drainage class	Well drained
Permeability class	Moderately rapid to rapid
Depth to restrictive layer	Not specified
Soil depth	60 in
Surface fragment cover <=3"	0–5%
Surface fragment cover >3"	0–10%
Available water capacity (0-40in)	3.1–7.1 in
Calcium carbonate equivalent (10-40in)	0%
Clay content (0-20in)	5–15%
Electrical conductivity (10-40in)	0–4 mmhos/cm
Sodium adsorption ratio (10-40in)	0
Soil reaction (1:1 water) (10-40in)	4.5–6
Subsurface fragment volume <=3" (0-60in)	10–40%
Subsurface fragment volume >3" (0-60in)	10–20%

Table 6. Representative soil features (actual values)

Drainage class	Moderately well drained to somewhat excessively drained
Permeability class	Not specified
Depth to restrictive layer	1 in
Soil depth	19 in
Surface fragment cover <=3"	0–35%
Surface fragment cover >3"	0–20%
Available water capacity (0-40in)	0.2–9.4 in
Calcium carbonate equivalent (10-40in)	Not specified
Clay content (0-20in)	Not specified
Electrical conductivity (10-40in)	Not specified
Sodium adsorption ratio (10-40in)	Not specified
Soil reaction (1:1 water) (10-40in)	3.4–6.9
Subsurface fragment volume <=3" (0-60in)	0–75%
Subsurface fragment volume >3" (0-60in)	0–50%

Ecological dynamics

Climate

Located in the subalpine life zone, this site is exposed to a variety of harsh environmental conditions. Compared to the boreal life zone, snowpack tends to be deeper and persist for longer durations of time. As a result, subalpine vegetation has a comparatively shorter season to grow and reproduce. When this site is snow-free, cold soil temperatures and high winds also inhibit plant growth and performance with krummholz white spruce being common. This harsh climate maintains vegetation within this site and prevents the establishment and/or growth of dominant boreal species like white spruce and black spruce.

The cover and density of white spruce associated with this site is highly variable but is largely controlled by the harsh subalpine climate. This site occurs at elevations just above the boreal life zone. Given the nearby seed source and high winds, this site receives ample seed rain from forested stands of white spruce. As a result, ocular cover of white spruce is highly variable commonly ranging from 0 to 15 percent canopy cover or more. While trees may be present, their ability to produce viable seed is limited by the harsh high-elevation climate (Roland et al. 2013). The subalpine climate combined with a fire regime greatly limits forest potential for this site.

Fire

Within this area, fire is considered a natural and common event that typically is unmanaged. Fire suppression is limited, and generally occurs adjacent to Fairbanks and the various villages spread throughout the area or on allotments with known structures, all of which have a relatively limited acre footprint. Most fires are caused by lightning strikes. From 2000 to 2020, 596 known fire events occurred in the Interior Alaska Uplands area and the burn perimeter of the fires totaled about 13.8 million acres (AICC 2022). Fire-related disturbances are highly patchy and can leave undisturbed areas within the burn perimeter. During this time frame, 80% of the fire events were smaller than 20,000 acres but 18 fire events were greater than 200,000 acres in size (AICC 2022). Over this period of 20 years, these burn perimeters cover approximately 30 percent of the Interior Alaska Uplands area.

The fire regime within Interior Alaska follows two general scenarios—low-severity burns and high-severity burns. It

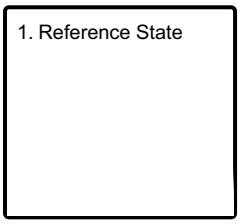
should be noted, however, that the fire regime in Interior Alaska can be much more complex (Johnstone et al. 2008). Burn severity refers to the proportion of the vegetative canopy and organic material consumed in a fire event (Chapin et al. 2006). Fires in cool and moist habitat tend to result in low-severity burns, while fires in warm and dry habitat tend to result in high-severity burns. Because the soils have a thin organic cap and are well to somewhat excessively drained, the typical fire scenario for this ecological site is considered to result in a high-severity burn.

Large portions of the organic mat are consumed during a high-severity fire event, commonly exposing pockets of mineral soil. The loss of this organic mat, which insulates the mineral soil, and the decrease in site albedo tends to cause overall soil temperatures to increase (Hinzman et al. 2006). These alterations to soil temperature may result in increased depths of seasonal frost in the soil profile. High-severity fire events also destroy a majority of the vascular and nonvascular biomass above ground.

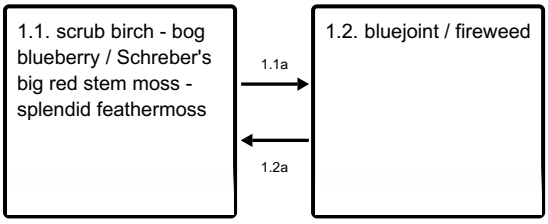
Field data suggest that the scrub dominant community 1.1 burns and that fire events will cause a transition to the pioneering stage of fire succession. This stage (community 1.2) is a mix of species that either regenerate in place (e.g., subterranean root crowns for willow and rhizomes for graminoids) and/or from wind-dispersed seed or spores that colonize exposed mineral soil (e.g., quaking aspen [*Populus tremuloides*] and Ceratodon moss [*Ceratodon purpureus*]). The pioneering stage of fire succession is primarily composed of forbs, grasses, and weedy bryophytes. This stage of succession currently persists for an unknown amount of time but is thought to last 10 to 30 years post-fire. Scrub birch and ericaceous shrubs continue to colonize and grow in stature on recently burned sites until they become dominant in the overstory, which marks the transition to the reference plant community (community 1.1).

State and transition model

Ecosystem states



State 1 submodel, plant communities



1.1a - A high-severity fire sweeps through and incinerates much of the above ground vegetation.

1.2a - Time without fire.

State 1
Reference State

Figure 9. A shrubby plant community associated with this site.

The reference plant community is closed low scrub (Viereck et al. 1992) with the dominant shrub being scrub birch (*Betula glandulosa*). There are two plant communities within the reference state related to fire.

Dominant plant species

- resin birch (*Betula glandulosa*), shrub
- bog blueberry (*Vaccinium uliginosum*), shrub
- Schreber's big red stem moss (*Pleurozium schreberi*), other herbaceous
- splendid feather moss (*Hylocomium splendens*), other herbaceous

Community 1.1
scrub birch - bog blueberry / Schreber's big red stem moss - splendid feathermoss

Figure 10. A typical plant community associated with community 1.1.

The reference plant community is characterized as closed low scrub (Viereck et al. 1992) with scrub birch the dominant overstory vegetation. White spruce are common but typically have limited cover. Other common species include bog blueberry, bog Labrador tea, marsh Labrador tea, crowberry, lingonberry, various reindeer lichen, Schreber's big red stem moss, and splendid feathermoss. The soil surface is primarily covered with herbaceous litter, lichen, and moss. The vegetative strata that characterize this community are medium shrubs (between 3 and 10 feet), low shrubs (between 8 and 36 inches), foliose and fruticose lichen, and mosses.

Forest overstory. Cover from seedlings and saplings (tree regeneration) were not included in the overstory canopy cover values but are included in the cover percent values for individual tree species. Basal area values reported for white spruce below are for all tree species in the plot.

The forest canopy was occasionally over 10 percent cover. In these instances, community 1.1 was classified as needleleaf woodland.

Dominant plant species

- white spruce (*Picea glauca*), tree
- resin birch (*Betula glandulosa*), shrub
- bog blueberry (*Vaccinium uliginosum*), shrub
- black crowberry (*Empetrum nigrum*), shrub
- bog Labrador tea (*Ledum groenlandicum*), shrub
- marsh Labrador tea (*Ledum palustre ssp. decumbens*), shrub
- Schreber's big red stem moss (*Pleurozium schreberi*), other herbaceous
- splendid feather moss (*Hylocomium splendens*), other herbaceous
- greygreen reindeer lichen (*Cladina rangiferina*), other herbaceous
- reindeer lichen (*Cladina stygia*), other herbaceous

Community 1.2
bluejoint / fireweed

Figure 11. A typical plant community associated with community 1.2.

Community 1.2 is in the pioneering stage of fire-induced secondary succession for this ecological site. It is characterized as either a mesic forb herbaceous or mesic graminoid herbaceous community (Viereck et al. 1992). White spruce occasionally occur but have limited cover. Although small areas of exposed bare soil are common, the soil surface is primarily covered with a mixture of weedy bryophyte species, woody debris, and herbaceous litter. Commonly observed species include various willow, fireweed, bluejoint, juniper polytrichum moss, and common liverwort (*Marchantia polymorpha*). The vegetative strata that characterize this community are medium forbs (between 4 and 24 inches), medium graminoids (between 4 and 24 inches), and mosses.

Dominant plant species

- white spruce (*Picea glauca*), tree
- willow (*Salix*), shrub
- bluejoint (*Calamagrostis canadensis*), grass
- fireweed (*Chamerion angustifolium*), other herbaceous
- juniper polytrichum moss (*Polytrichum juniperinum*), other herbaceous
- (*Marchantia polymorpha*), other herbaceous

Pathway 1.1a
Community 1.1 to 1.2

scrub birch - bog blueberry / Schreber's big red stem moss - splendid feathermoss

bluejoint / fireweed

A fire sweeps through and incinerates much of the above ground vegetation. Because of the associated dry soils, this site commonly experiences high-severity fires. A significant proportion of organic matter is consumed, leaving exposed mineral soil. Vegetation usually resprouts from surviving individuals or is recruited from nearby areas via seed or seedbank

Pathway 1.2a
Community 1.2 to 1.1

bluejoint / fireweed

scrub birch - bog blueberry / Schreber's big red stem moss · splendid feathermoss

Time without fire. Grass and forb cover decreases, while scrub birch and ericaceous shrub cover increases.

Additional community tables

Table 7. Community 1.1 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height (Ft)	Canopy Cover (%)	Diameter (In)	Basal Area (Square Ft/Acre)
Tree							
white spruce	PIGL	*Picea glauca*	Native	15–44	0–20	1.5–17.3	–
black spruce	PIMA	*Picea mariana*	Native	13–23	0–10	2.3–5.4	–
resin birch	BENE4	*Betula neoalaskana*	Native	–	0–1	–	–

Table 8. Community 1.1 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (Ft)	Canopy Cover (%)
Grass/grass-like (Graminoids)					
Altai fescue	FEAL	*Festuca altaica*	Native	2–4	0–15
Forb/Herb					
bunchberry dogwood	COCA13	*Cornus canadensis*	Native	0.1–0.3	0–7
Shrub/Subshrub					
resin birch	BEGL	*Betula glandulosa*	Native	3–6	12–95
bog Labrador tea	LEGR	*Ledum groenlandicum*	Native	0.8–3	0–75
bog blueberry	VAUL	*Vaccinium uliginosum*	Native	0.8–3	0–55
black crowberry	EMNI	*Empetrum nigrum*	Native	0.1–0.3	0–30
birch	BEDU	*Betula ×dugleana*	Native	5–10	0–20
lingonberry	VAVI	*Vaccinium vitis-idaea*	Native	0.1–0.3	0–15
marsh Labrador tea	LEPAD	*Ledum palustre ssp. decumbens*	Native	0.8–3	0–15
tealeaf willow	SAPU15	*Salix pulchra*	Native	3–5	0–10
Siberian alder	ALVIF	*Alnus viridis ssp. fruticosa*	Native	3–5	0–10
beauverd spirea	SPST3	*Spiraea stevenii*	Native	0.8–3	0–5
twinflower	LIBO3	*Linnaea borealis*	Native	0.1–0.3	0–5
Nonvascular					
splendid feather moss	HYSP70	*Hylocomium splendens*	Native	0.1–0.3	0–80
Schreber's big red stem moss	PLSC70	*Pleurozium schreberi*	Native	0.1–0.3	0–65
greygreen reindeer lichen	CLRA60	*Cladina rangiferina*	Native	0.1–0.3	0–40
reindeer lichen	CLST5	*Cladina stygia*	Native	0.1–0.3	0–35
polytrichum moss	POLYT5	*Polytrichum*	Native	0.1–0.3	0–30
	FLCU	*Flavocetraria cucullata*	Native	0.1–0.3	0–30
knights plume moss	PTCR70	*Ptilium crista-castrensis*	Native	0.1–0.3	0–20
reindeer lichen	CLMI60	*Cladina mitis*	Native	0.1–0.3	0–7
Richardson's masonhalea lichen	MARI60	*Masonhalea richardsonii*	Native	0.1–0.3	0–5
tomentose snow lichen	STTO60	*Stereocaulon tomentosum*	Native	0.1–0.3	0–5
felt lichen	PEAP60	*Peltigera aphthosa*	Native	0.1–0.3	0–4
cup lichen	CLADO3	*Cladonia*	Native	0.1–0.3	0–2

Animal community

n/a

Hydrological functions

n/a

Recreational uses

n/a

Wood products

n/a

Other products

n/a

Other information

n/a

Inventory data references

Tier 2 sampling plots used to develop the reference state. Plot numbers as recorded in NASIS with associated community phase.

Community 1.1

13BA00102, 13EG00704, 13NR00603, 13NR00703, 2015AK290543, 2015AK290560, 2015AK290577, 2015AK290823, 2016AK090007, 2016AK290384, 2016AK290606, 2016AK290607, 2017AK290505, 2017AK290506, 2017AK290514

Community 1.2

2015AK290805

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Approval

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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	04/23/2024
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:**

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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):**

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14. **Average percent litter cover (%) and depth (in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if**

their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:

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17. **Perennial plant reproductive capability:**
