

# Ecological site F227XY110AK

## Mountain Slopes, Shallow Cobblank

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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.



**Figure 1. Mapped extent**

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

**Table 1. Dominant plant species**

Tree	(1) <i>Picea glauca</i>
Shrub	(1) <i>Betula glandulosa</i>
Herbaceous	Not specified

### Physiographic features

This site occurs on bedrock cored mountain slopes and summits below about 2900 feet (884 m) elevation. Most areas have been smeared with a thin mantle of loamy till and lacustrine deposits. Slopes range from about 8 to 35 percent.

In the Gulkana River area, this site is of minor occurrence in a few scattered locations above the Middle Fork and upper Main Stem. It is probably extensive at middle elevations throughout the Copper River basin

**Table 2. Representative physiographic features**

Landforms	(1) Mountain slope
Flooding frequency	None
Elevation	762–884 m

Slope	0–35%
Water table depth	152 cm
Aspect	Aspect is not a significant factor

## Climatic features

The subarctic continental climate of this site is characterized by long cold winters and short warm summers. Mean January temperature is -2 °F.; mean July temperature is 54 °F. Mean annual precipitation ranges from 15 to 21 inches. Annual snowfall ranges from 54 to 102 inches. The frost-free season is about 60 to 80 days (28 °F. base temperature). The growing season varies greatly from year to year and frosts can occur during any summer month.

**Table 3. Representative climatic features**

Frost-free period (average)	80 days
Freeze-free period (average)	0 days
Precipitation total (average)	533 mm

## Influencing water features

### Soil features

The moderately well developed soils on this site have a mantle of silty eolian material 1 to 4 inches (2 to 10 cm) thick over very gravelly and very cobbly loamy till and loamy lacustrine material. Bedrock is at depths of 10 to 20 inches in most places. The soils are well drained. Parent material is glacial till and colluvium over bedrock. Note: this is not available as a choice below.

**Table 4. Representative soil features**

Surface texture	(1) Silt loam
Family particle size	(1) Loamy
Drainage class	Well drained
Soil depth	25–51 cm
Available water capacity (0-101.6cm)	0.3–0.51 cm

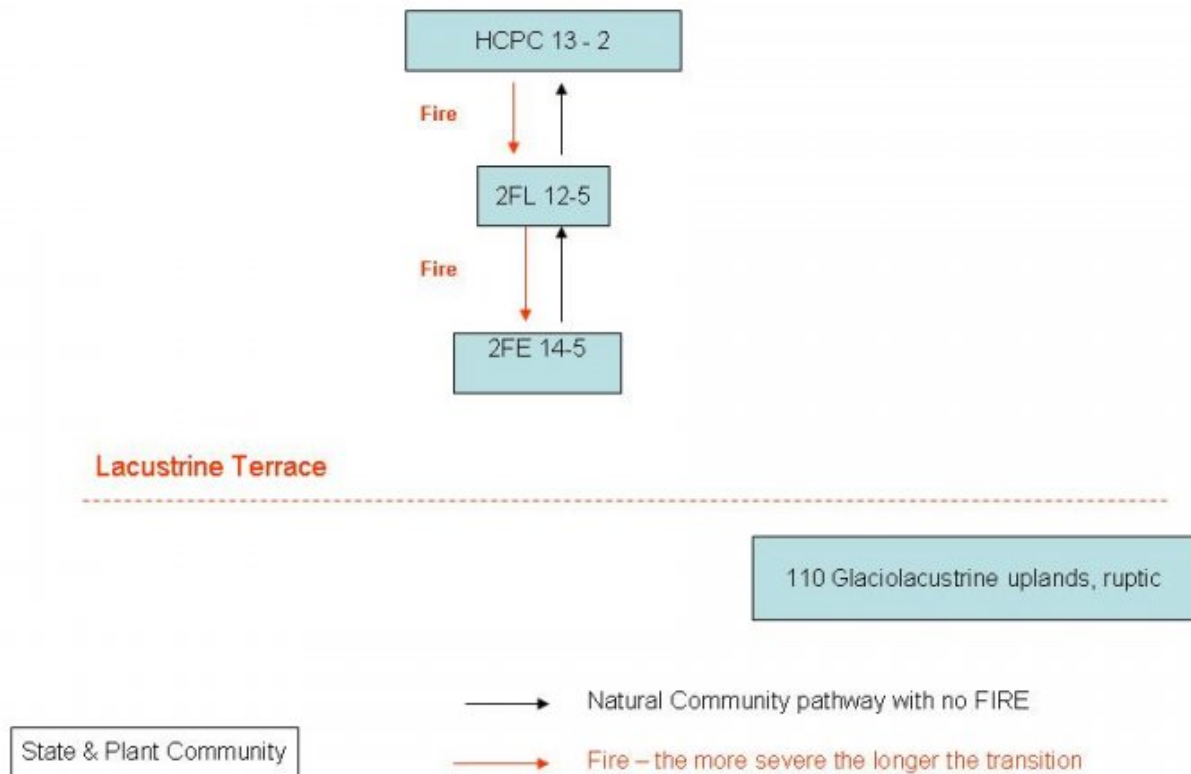
## Ecological dynamics

Spruce/shrub birch woodland is best described as mid to late seral. This type develops on a wide variety of sites following fire, either from Low shrub birch scrub or Low shrub birch/lichen scrub. On sandy and gravelly soils on stream terraces, outwash plains, and strandline deposits, and other sites with a short fire return interval, Spruce/shrub birch woodland is probably the potential. Elsewhere, continued succession may lead to Spruce/spruce muskeg sedge open forest and possibly Black spruce/closed sheath cottongrass woodland.

Wildfire, which is common in the boreal forest zone of the Copper River basin, periodically impacts this site. Most stands have common to abundant charred snags and woody debris; scattered trees and clumps of trees are common also. Following wildfire, the vegetation on this site would be expected to go through a relatively short-lived herb stage codominated by herbs and shrub sprouts. This would be followed by a Low shrub birch scrub stage with occasional to common spruce regeneration. Most areas of this site in the Gulkana River area currently support Low shrub birch scrub. Woodland development likely is a long-term process at the elevation and on the soils of this site. Seed trees in many burned stands were rare and tree seedlings nearly impossible to find.

Riparian-Wetland Status Classification: almost always upland; occasionally Palustrine needle-leafed evergreen scrub-shrub and forested (Cowardin et al. 1979)

## State and transition model



### State 1

#### Spruce/Shrub Birch Woodland

##### Community 1.1

#### Spruce/Shrub Birch Woodland

Spruce/shrub birch scrub is the correlated PNC on this site. At the elevation of this site, *Picea glauca* is the usually the only spruce found. Seral Low shrub birch scrub is present in many places.

**Forest overstory.** Spruce/shrub birch woodland consists of woodland to occasionally moderately open stands of spruce. Overstory composition varies from *Picea glauca* to mixed *P. glauca* and *P. mariana*. Tree canopy cover ranges from 10 to 55 percent. Trees are typically 15 to 35 feet (4.6 to 10.7 m) in height and 4 to 6.5 inches (10 to 16.5 cm) in diameter at ground level. Trees and small stands to 60 feet (18.3 m) in height occasionally occur. Basal area of trees varies considerably between stands, ranging from 23 to 130 feet<sup>2</sup>/acre (5.3 to 29.8 m<sup>2</sup>/ha) in 18 sample stands. Snags and charred boles and downfall are well-represented in burned stands.

**Forest understory.** The understory is dominated by abundant to very abundant medium, low, and dwarf shrubs. There are usually two relatively distinct shrub layers. The upper layer is approximately 4.5 to 6 feet (1.4 to 1.8 m) in height. The overall dominant medium shrub is *Betula glandulosa*; however, *Salix planifolia* is common in most stands. *S. glauca* and other tall willows are common to well-represented in many stands. The lower shrub layer is composed of a number of low and dwarf ericaceous shrub 0.5 to 3.5 feet (0.2 to 1.1 m) in height. Common to abundant species include *Ledum* spp., *Vaccinium uliginosum*, *V. vitis-idaea*, *Empetrum nigrum*, and *Arctostaphylos rubra*. Total shrub canopy cover ranges from around 45 to 90 percent or more.

Herbs generally are of minor importance in Spruce/shrub birch woodland. Commonly occurring species include *Petasites frigidus*, *Arctagrostis latifolia*, *Equisetum* spp., *Rubus chamaemorus*, and *Carex lugens*. Mosses and lichens on the ground surface range from sparse, scattered patches to nearly continuous, luxuriant cover, depending on fire history and stand age.

**Table 5. Ground cover**

Tree foliar cover	1-15%
Shrub/vine/liana foliar cover	1-65%
Grass/grasslike foliar cover	1%
Forb foliar cover	1%
Non-vascular plants	1-35%
Biological crusts	0%
Litter	1-50%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	1%

**Table 6. Canopy structure (% cover)**

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	–	–	–	–
>0.15 <= 0.3	–	–	–	–
>0.3 <= 0.6	–	–	0-5%	0-5%
>0.6 <= 1.4	–	50-90%	–	–
>1.4 <= 4	–	–	–	–
>4 <= 12	10-20%	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

**Figure 3. Plant community growth curve (percent production by month).**  
AK0001, MLRA 172 Balsam poplar-whitespruce/thinleaf alder. Mixed forest shrub on floodplains..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	15	30	45	10	0	0	0	0

## State 2 Low Shrub Birch Scrub

### Community 2.1 Low Shrub Birch Scrub

Low shrub birch scrub consists of moderately open to closed stands of medium and low shrubs dominated by *Betula glandulosa*, *Ledum* spp., and *Vaccinium uliginosum*. Dwarf shrub, primarily *Vaccinium vitis-idaea* and *Empetrum nigrum*, also are usually abundant. In most places, Low shrub birch scrub appears to be an early, post-fire seral stage leading to Spruce/shrub birch woodland or Spruce/spruce muskeg sedge open forest. Most stands have common to well-represented scattered trees and unburned woodland to reseed the stand, and *Picea glauca*

and *P. mariana* seedlings and saplings are common. At higher elevations and on steep slopes, seed trees and seedlings are generally absent to uncommon, suggesting that progression toward the woodland stages in these stands may take a long time. Above about 2,700 feet (823 m), Low shrub birch scrub, where present, is probably the potential vegetation. The *Carex lugens* understory phase described above appears to be a condition associated with crown fires in which the woodland understory was essentially unburned or only lightly burned. These are the stands which more than likely have permafrost and a water table present in the soil profile. Riparian-Wetland Status Classification: usually upland; occasionally Palustrine broad-leaved deciduous scrub-shrub, saturated, mineral and organic (Cowardin et al. 1979)

**Forest understory.** *B. glandulosa* is typically 4.5 to 7 feet (1.4 to 2.1 m) in height and forms an irregular, broken upper shrub layer. Other shrubs are usually about 3 feet (0.9 m) in height or less and fill in the spaces between and below the birch. In many stands, *Picea glauca* and/or *P. mariana* saplings, small trees, and relic trees are common to well-represented. Canopy cover of the upper shrub layer ranges from 25 to 70 percent. Total shrub canopy cover is usually between 50 and 90 percent.

In most stands, the herb layer is sparse to open. The number of different herb species is usually fairly high; however, no species are particularly abundant. Important herbs include *Equisetum* spp., *Petasites frigidus*, *Epilobium angustifolium*, *Arctagrostis latifolia*, and *Calamagrostis canadensis*. A mosaic of feathermoss, lichen, and litter covers the ground surface. In some stands on more mesic sites, *Carex lugens* is abundant to very abundant, and lichen is usually considerably more abundant. Most stands show evidence of recent burns, and snags and woody litter are common to well-represented.

**Table 7. Ground cover**

Tree foliar cover	1-30%
Shrub/vine/liana foliar cover	1-60%
Grass/grasslike foliar cover	1-85%
Forb foliar cover	1-65%
Non-vascular plants	1-85%
Biological crusts	0%
Litter	1-60%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	1-15%

**Figure 4. Plant community growth curve (percent production by month). AK0001, MLRA 172 Balsam poplar-whitespruce/thinleaf alder. Mixed forest shrub on floodplains..**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	15	30	45	10	0	0	0	0

### State 3

#### Black spruce/closed sheath cottongrass woodland

##### Community 3.1

#### Black spruce/closed sheath cottongrass woodland

Black spruce/closed sheath cottongrass woodland consists of woodland to open stands of stunted, small diameter *Picea mariana*. Tree canopy cover ranges from 10 to occasionally 45 percent. Black spruce/closed sheath cottongrass woodland is the PNC vegetation on nearly level to concave sites that have remained undisturbed by wildfire for an extended period of time. This type is usually in association with Low shrub birch/closed sheath

cottongrass scrub. These two cover types are transitional with one another and often the break between them is arbitrary. Riparian-Wetland Classification: Palustrine needle-leaved evergreen scrub-shrub, saturated, organic

**Forest overstory.** In most stands, trees are 10 to 18 feet (3.0 to 5.5 m) in height and 1.5 to 4 inches (4 to 10 cm) in diameter at ground level. Occasional trees up to 35 feet (10.7 m) in height and 6 inches (15 cm) in diameter are in most stands. Tree basal area in Black spruce/closed sheath cottongrass woodland ranges from 5 to 60 feet<sup>2</sup>/acre (1.1 to 13.8 m<sup>2</sup>/ha) based on 13 sample stands.

**Forest understory.** *Eriophorum brachyantherum* tussocks, intermixed with a variety of sedges and low and dwarf shrubs, characterize the understory. In areas of strong tussock development, tussocks range from 9 to 24 inches (23 to 61 cm) in height with spacing between of 8 to 16 inches (20 to 41 cm), and shrubs and other herbs are uncommon. Where tussock development is weaker, low and dwarf shrubs and other sedges codominate. The most frequently occurring sedges are *Carex aquatilis* in wetter microsites and *C. lugens* on higher microsites. Important low and dwarf shrubs include *Ledum* spp., *Vaccinium uliginosum*, *Betula glandulosa*, *V. vitis-idaea*, *Salix planifolia*, and *Empetrum nigrum*. Except for *Rubus chamaemorus* and *Petasites frigidus*, other herbs are uncommon. *R. chamaemorus* forms a moderately open cover in occasional stands. Throughout Black spruce/closed sheath cottongrass woodland, mosses, and in particular *Sphagnum*, cover much of the soil surface and ponded water and saturated conditions are common between the tussocks.

**Table 8. Ground cover**

Tree foliar cover	1-20%
Shrub/vine/liana foliar cover	1-45%
Grass/grasslike foliar cover	1-10%
Forb foliar cover	1-15%
Non-vascular plants	15-60%
Biological crusts	0%
Litter	5-30%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	2-15%

**Table 9. Canopy structure (% cover)**

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	–	–	–	–
>0.15 <= 0.3	–	–	–	–
>0.3 <= 0.6	–	–	15-30%	15-30%
>0.6 <= 1.4	–	35-65%	–	–
>1.4 <= 4	–	–	–	–
>4 <= 12	10-20%	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

**Figure 5. Plant community growth curve (percent production by month).**  
AK0001, MLRA 172 Balsam poplar-whitespruce/thinleaf alder. Mixed forest shrub on floodplains..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	15	30	45	10	0	0	0	0

## Additional community tables

### Animal community

Habitat is suitable for Moose, Caribou and Grizzly for certain periods of time.

### Contributors

Michelle Schuman

### 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	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

### Indicators

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

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

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

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

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

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

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7. **Amount of litter movement (describe size and distance expected to travel):**

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

Dominant:

Sub-dominant:

Other:

Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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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:**

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