

Ecological site F227XY106AK

Glaciolacustrine Uplands Telay, Gadona, Chelina

Accessed: 05/18/2024

General information

**Provisional.** A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.



Figure 1. Mapped extent

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

Table 1. Dominant plant species

Tree	(1) <i>Picea mariana</i> (2) <i>Picea glauca</i>
Shrub	(1) <i>Betula glandulosa</i>
Herbaceous	Not specified

Physiographic features

This site occurs on lacustrine terraces, till plains, and hills formed in loamy and clayey lacustrine deposits and gravelly and loamy glacial till. Permafrost is generally absent. Slopes in most places range from 0 to about 20 percent. Elevation is from 1900 to 2800 feet (579 to 853 m).

This site is found throughout the uplands in the Gulkana River area. It occurs intermittently on the same landscape with sites with shallow permafrost. This site is extensive at low to mid elevations throughout the Copper River basin.

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Till plain (3) Hill
Flooding frequency	None
Elevation	579–853 m
Slope	0–20%
Water table depth	183 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 poorly developed soils on this site are formed in gravelly glacial till and fine-grained lacustrine deposits. The organic mat is generally less than 6 inches (15 cm) thick. Some soils have a surface mantle of silty eolian material up to 8 inches (20 cm) thick. In most places there is no water table present within the soil profile and the soils are well drained

**Table 4. Representative soil features**

Surface texture	(1) Silt loam (2) Loam (3) Silty clay
Family particle size	(1) Loamy
Soil depth	152 cm
Available water capacity (0-101.6cm)	0.3–0.51 cm

## Ecological dynamics

Vegetation on this site is highly susceptible to wild fire. In most instances, fire would kill the spruce trees and destroy much if not all of the woodland overstory. Following fires of moderate or less severity, sprouting from root crowns and other underground organs should initially produce Low shrub birch scrub or similar vegetation. A severe burn, one in which the moss-organic layer was consumed to mineral soil, would allow for the establishment of pioneering lichens, mosses, and herbs on the soil surface.

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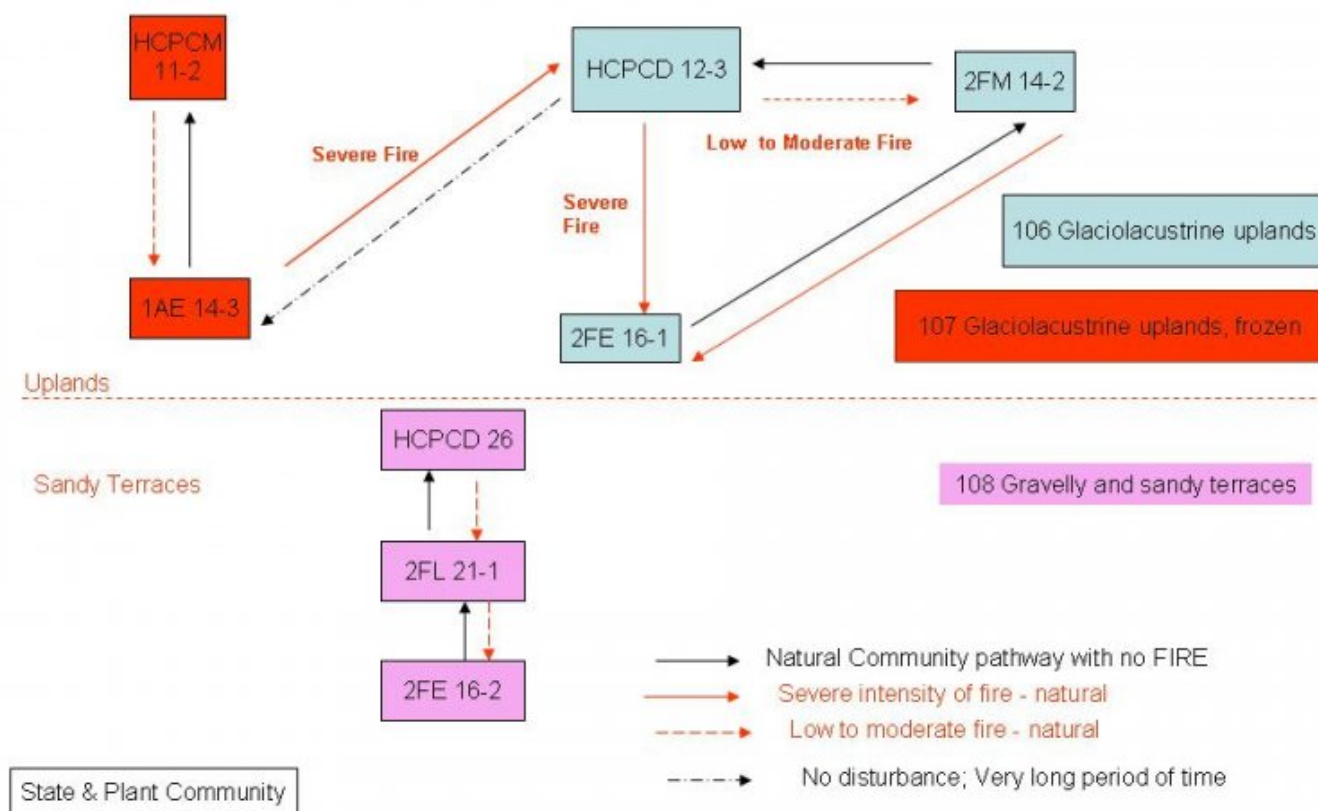
pioneering lichens, mosses, and herbs on the soil surface.

Regeneration of the woodland overstory will depend to a large degree on available seed sources, severity of burn, and suitability of the seed bed and environment. In the boreal forest zone, repeated fires generally favors the establishment of black spruce over white spruce. Continued tree regeneration and growth would eventually lead to Spruce/shrub birch woodland. Post-fire succession on severely burned areas may pass through a Spruce/lichen woodland stage. This vegetation could persist for an extended period of time until the moss-organic layer becomes re-established.

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## State and transition model

Relationship between permafrost and non-permafrost ecological sites on uplands and terraces



## State 1 Low Shrub Birch Scrub

### Community 1.1 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*. 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 Classification: usually upland; occasionally Palustrine broad-leaved deciduous scrub-shrub, saturated, mineral and organic (Cowardin et al. 1979)

**Forest overstory.** 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.** Dwarf shrub, primarily *Vaccinium vitis-idaea* and *Empetrum nigrum*, also are usually abundant. *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.

**Table 5. Ground cover**

Tree foliar cover	1-45%
Shrub/vine/liana foliar cover	1-70%
Grass/grasslike foliar cover	1-10%
Forb foliar cover	1-25%
Non-vascular plants	1-85%
Biological crusts	0%
Litter	1-30%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	1-5%

**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	—	—	—	—
>0.6 <= 1.4	—	50-85%	1-15%	1-15%
>1.4 <= 4	—	—	—	—
>4 <= 12	15-45%	—	—	—
>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

### Spruce/Shrub Birch Woodland

### Community 2.1

#### Spruce/Shrub Birch Woodland

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. The understory is dominated by abundant to very abundant medium, low, and dwarf shrubs. There are usually two relatively distinct shrub layers. 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

**Forest overstory.** 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 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 7. Ground cover

Tree foliar cover	1-40%
Shrub/vine/liana foliar cover	1-65%
Grass/grasslike foliar cover	1-4%
Forb foliar cover	1-6%
Non-vascular plants	15-65%
Biological crusts	0%
Litter	1-35%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	1-5%

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

### Low Shrub Birch Lichen Scrub

#### Community 3.1

##### Low Shrub Birch Lichen Scrub

Low shrub birch/lichen scrub consists of moderately open to closed stands of medium and low shrubs dominated by *Betula glandulosa*, *Ledum* spp., *Vaccinium uliginosum*, and *Salix* spp., with abundant to very abundant fruticose lichens in the ground layer. In most places, Low shrub birch scrub is an early, post-fire seral stage leading to Spruce/lichen woodland and Spruce/shrub birch woodland. It appears to develop only on relatively xeric sites or other sites that have been moderately to severely burned. Most stands have common to well-represented scattered trees and unburned woodland to reseed the stand. *Picea glauca* and *P. mariana* seedlings and saplings are common in most stands. On pitted outwash plains and hills in the vicinity of Dickey Lake and at higher elevations in the subalpine zone, this type probably is late seral or potential vegetation. Riparian-Wetland Classification: upland

**Forest overstory.** 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.

**Forest understory.** Dwarf shrub, primarily *Vaccinium vitis-idaea* and *Empetrum nigrum*, are also usually well-represented to abundant. *B. glandulosa* is typically 3.5 to 5.5 feet (1.1 to 1.8 m) in height and forms a nearly continuous open to moderately closed 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. Total shrub canopy cover is usually between 50 and 90 percent.

Abundant to very abundant lichen cover, patches of mosses, and litter characterize the aspect of the ground layer. In most stands, the herb layer is sparse to occasionally open and the number of herb species is low. An important herb in many stands is *Festuca altaica*. Other frequently occurring herbs include *Epilobium angustifolium*, *Pedicularis labradorica*, *Senecio* spp., *Petasites frigidus*, *Arctagrostis latifolia*, and *Calamagrostis canadensis*. Most stands show evidence of recent burns, and snags and woody litter are common to well-represented.

Table 8. Ground cover

Tree foliar cover	1-30%
Shrub/vine/liana foliar cover	1-85%
Grass/grasslike foliar cover	1-55%
Forb foliar cover	1-3%
Non-vascular plants	1-65%
Biological crusts	0%
Litter	5-35%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	1-7%

## Additional community tables

### 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):**

- 
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:**
-