

# Ecological site F227XY104AK

## Stream Terraces Ganhona, Kusdry, Maclaren, Sinona

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

### Physiographic features

This site consists of level to gently sloping stream terraces and nearly level to moderately steep dissected stream terraces formed in a thin to moderately thick layer of stratified sandy and silty alluvium over very gravelly alluvium. Permafrost is generally absent on this site. Elevation is from about 1950 to 2600 feet (594 to 792 m).

This site occurs along all reaches of the Gulkana River and is probably widespread on stream terraces elsewhere in the Copper River basin.

**Table 2. Representative physiographic features**

Landforms	(1) Terrace
Flooding frequency	None to rare

Elevation	594–792 m
Slope	0–20%
Water table depth	183 cm

## 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 19 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)	2,032 mm

## Influencing water features

### Soil features

The moderately well developed soils on this site typically have a mantle of stratified sandy and silty alluvium 2 to 31 inches (5 to 79 cm) thick over very gravelly alluvium. The surface organic mat ranges from 1 to 6 inches (2.5 to 15 cm) thick. Depth to seasonal high water table is more than 6 feet (1.8 m) and the soils are well drained.

**Table 4. Representative soil features**

Surface texture	(1) Silt loam (2) Loam (3) Fine sandy loam
Family particle size	(1) Loamy
Soil depth	152 cm
Available water capacity (0-101.6cm)	0.33–0.51 cm

## Ecological dynamics

Wild fire impacts on the vegetation on this site are complex. In most instances, fire would kill the spruce trees and destroy much if not all of the woodland overstory. Following fires of moderate severity, sprouting from root crowns and other underground organs should initially produce Low shrub birch scrub and Low shrub birch/lichen scrub vegetation similar to the understory of the potential natural plant community. 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. Site productivity would likely improve somewhat following a burn, but not the extent that it might on a site with shallow permafrost. Eventual stand replacement will depend to a large degree on nearby seed sources, the severity of burn, and the suitability of the seed bed. In the boreal forest zone, repeated fires generally favors the establishment of *Picea mariana* over *Picea glauca*. Observations and data collected in the Gulkana River area suggest that in many places this site represents a retrogressive stage of site 172Xy103AK - Loamy Stream Terraces, Frozen, in which wild fire has indirectly caused the permafrost to thaw and retreat deep into the soil or possibly disappear completely.

Elsewhere, particularly on dissected terrace remnants with only a thin surface layer of finer textured alluvium, the potential for permafrost probably is limited and this site appears to represent the end point of site progression on flood plains and stream terraces. This portion of the site is also where Spruce/lichen woodland is usually found.

## State and transition model

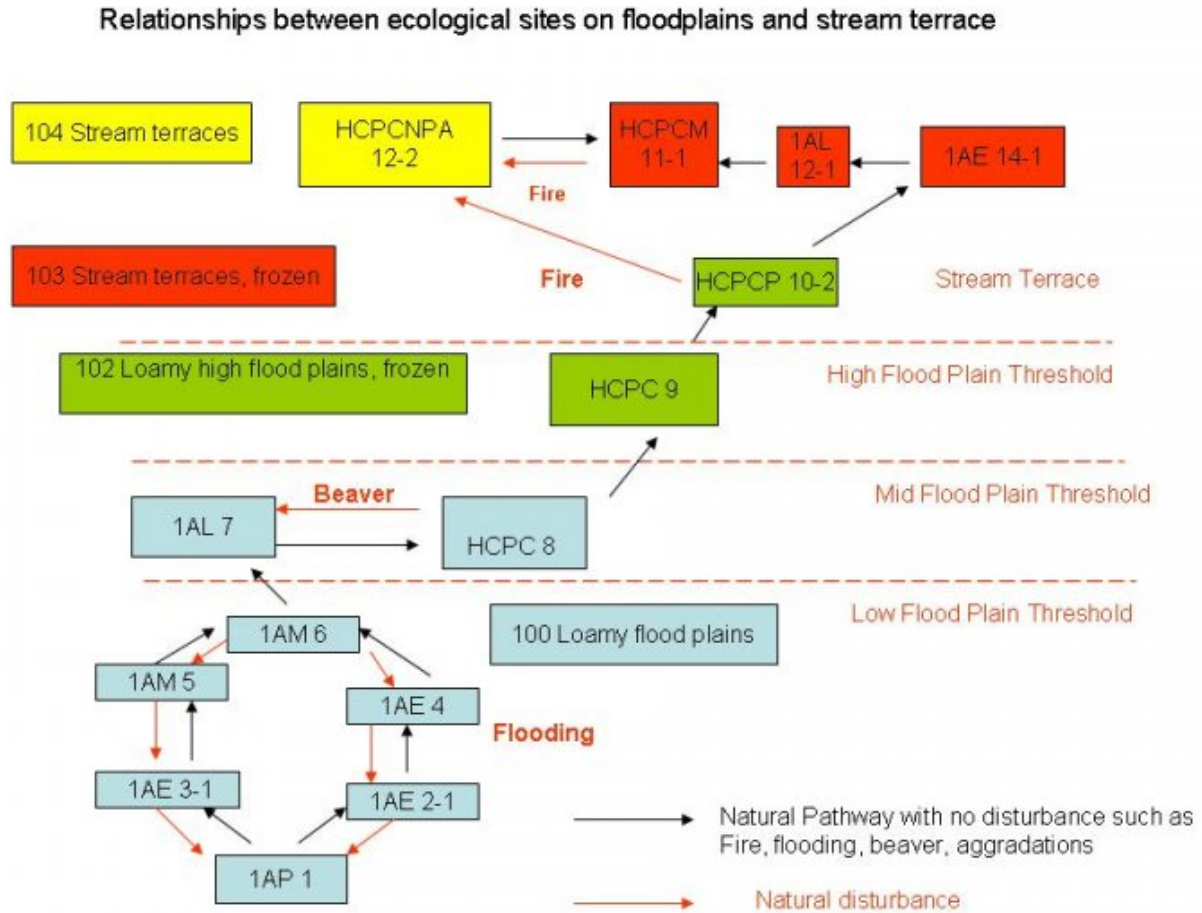


Figure 3. Frozen floodplain and terraces

### State 1 Spruce/Shrub Birch Woodland

#### Community 1.1 Spruce/Shrub Birch Woodland

Spruce/shrub birch woodland consists of woodland to occasionally moderately open stands of spruce. Distribution and extent: river corridor and uplands; one of the most extensive and widely distributed cover types in the survey area. Elevation: 1,850 to 3,000 feet (564 to 914 m). Landforms: nearly level stream terraces; nearly level to strongly sloping lacustrine terraces; and moderately steep to steep hill slopes, escarpments, and alluvial fans. Principal soils: all mineral soils on stream terraces and uplands in the survey area; organic mat thickness ranges from 0 to 10 inches (0 to 25 cm). Depth to permafrost: primarily greater than 40 inches (greater than 102 cm); occasionally from 0 to 40 inches (0 to 102 cm). Depth to seasonally high water table: primarily greater than 40 inches (greater than 102 cm) below the mineral surface; frequently from within the organic mat to 40 inches (102 cm). 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. Riparian-Wetland Status Classification: almost always upland; occasionally Palustrine needle-leafed evergreen scrub-shrub and forested (Cowardin et al. 1979)

**Forest overstory.** 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	1-50%
Shrub/vine/liana foliar cover	1-70%
Grass/grasslike foliar cover	1-35%
Forb foliar cover	1-70%
Non-vascular plants	1-95%
Biological crusts	0%
Litter	1-50%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	1-15%

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

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	–	–	–	–
>0.15 <= 0.3	–	–	7-60%	7-60%
>0.3 <= 0.6	–	–	–	–
>0.6 <= 1.4	–	50-90%	–	–
>1.4 <= 4	–	–	–	–
>4 <= 12	15-45%	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

**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

## Additional community tables

### Hydrological functions

Observations and data collected in the Gulkana River area suggest that in many places this site represents a retrogressive stage of site 172Xy103AK - Loamy Stream Terraces, Frozen, in which wild fire has indirectly caused the permafrost to thaw and retreat deep into the soil or possibly disappear completely.

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### Recreational uses

Deteriorating stands of *Picea glauca* in the transitional zone between high flood plains and stream terraces often contain abundant downfall suitable for firewood. Standing dead trees will provide a future source of firewood.

### Other information

Wild fire impacts on the vegetation on this site are complex. In most instances, fire would kill the spruce trees and destroy much if not all of the woodland overstory. Following fires of moderate severity, sprouting from root crowns and other underground organs should initially produce Low shrub birch scrub and Low shrub birch/lichen scrub vegetation similar to the understory of the potential natural plant community. 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. Site productivity would likely improve somewhat following a burn, but not the extent that it might on a site with shallow permafrost. Eventual stand replacement will depend to a large degree on nearby seed sources, the severity of burn, and the suitability of the seed bed. In the boreal forest zone, repeated fires generally favor the establishment of *Picea mariana* over *Picea glauca*.

### 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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