Ecological site F227XY103AK
Stream Terraces Frozen

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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.

Table 1. Dominant plant species

Tree	(1) *Picea glauca* (2) *Picea mariana*
Shrub	(1) *Betula glandulosa*
Herbaceous	(1) *Carex lugens*

Physiographic features

This site consists of level to moderately sloping, poorly drained stream terraces with shallow to very shallow permafrost. Elevation is generally 1850 to 2600 feet (564 to 792 m).

In the Gulkana River area, this site occurs along all reaches of the River except for the upper Middle Fork. This site is probably widespread on stream terraces at mid elevations throughout the Copper River basin.

Table 2. Representative physiographic features

Landforms	(1) Terrace
Flooding frequency	Rare to none
Elevation	560 – 790 m
Slope	0 – 10 %
Water table depth	0 – 30 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)	0 days
Freeze-free period (average)	0 days
Precipitation total (average)	0 mm

Influencing water features

Soil features

Soils on this site are very poorly or poorly drained and very shallow or shallow to permafrost. They typically have an organic mat 8 to 16 inches (20 to 41 cm) thick over stratified sandy and silty alluvium. Depth to permafrost ranges from 4 to 32 inches (10 to 81 cm) below the mineral soil surface. A water table is perched on the impermeable permafrost; depth to the top of the water table ranges from within the organic mat to about 12 inches (15 cm) below the mineral surface. A reduced matrix or common reduction mottles are present above the permafrost in most profiles. Principal soils are Klasi, Mendna, Cryaquepts, Kuslinad, and Chelina (Organic mat thickness mostly ranges from 2 to 15 inches [5 to 38 cm].)
Depth to permafrost is variable; ranges from the mineral surface to greater than 60 inches (greater than 152 cm).

Table 4. Representative soil features

Family particle size	(1) Loamy
Soil depth	10 − 80 cm

Ecological dynamics

Wild fire impacts on this site are complex and difficult to predict. 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 plant parts should initially produce 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. With the insulating moss-organic layer burned off, the soil temperatures would be expected to increase, resulting in melting of the permafrost and a drop in the water table. Site productivity should improve markedly at this point and then gradually decrease once again as the moss-organic layer re-establishes and thickens. Stand replacement will depend to a large degree on proximity of seed sources, the severity of burn, and suitability of the seed bed. In the boreal forest zone, repeated fires generally favors the establishment of Picea mariana over Picea glauca.
Based on observations and data collected in the Gulkana River area, this site is the end point of flood plain-stream terrace site progression and vegetation succession. As the terrace is elevated above the level of flooding by down-cutting of the channel and sediment accretion, this site develops from 172Xy101AK - Loamy High Flood Plains and 172Xy102AK - Loamy High Flood Plains, Frozen. As the surface moss layer and organic mat continues to develop and permafrost rises within the soil profile, the original Picea glauca stand dies-off and is replaced by less productive P. glauca and P. mariana. The understory changes from Salix spp. dominance on site 172Xy101AK or Alnus tenuifolia on site 172Xy102AK to dominance by Betula glandulosa, various ericaceous shrubs, and feathermosses. Apparently, Carex lugens becomes abundant in the herb layer only in places that have remained undisturbed by wild fire for an extended period of time. Prior to this point, vegetation on this site consists primarily of Spruce/shrub birch woodland.

State and transition model

Figure 3. Frozen floodplain and terraces

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 6. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 7. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Recreational uses

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

Other information

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Contributors

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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	
Approved by	
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:

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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:**
