

## Ecological site R227XY105AK Terraces, Wet Klasi, very wet

Accessed: 05/05/2024

### 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.

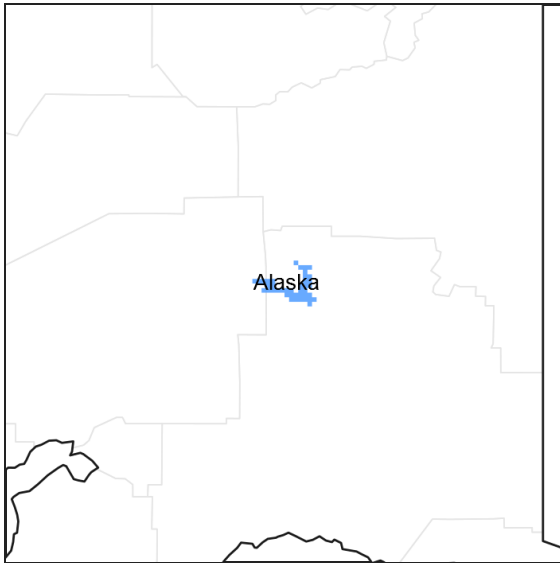


Figure 1. Mapped extent

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.

### Associated sites

F227XY103AK	Stream Terraces Frozen Kuslinad
F227XY104AK	Stream Terraces Ganhona, Kusdry, Maclaren, Sinona
F227XY106AK	Glaciolacustrine Uplands Telay, Gadona, Chelina
F227XY107AK	Glaciolacustrine Uplands, Frozen Kuslined
F227XY111AK	Peat Mounds Pergelic Cryohemists, Dry
R227XY202AK	Shallow Drainages Dackey cool, swedna, sankluna, ostna
R227XY501AK	Wet Depressions

### Similar sites

F227XY107AK	Glaciolacustrine Uplands, Frozen Kuslined
F227XY103AK	Stream Terraces Frozen Kuslinad

Table 1. Dominant plant species

Tree	(1) <i>Picea mariana</i>
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Shrub	Not specified
Herbaceous	(1) <i>Eriophorum brachyantherum</i>

## Physiographic features

This site occurs on nearly level and broadly concave stream terraces and lacustrine terraces and on toeslopes on lacustrine terrace escarpments. The surface is mantled in moderately thick to thick organic deposits. Surface microtopography is strongly hummocky. Most areas of this site appear to receive a surplus of water as surface and ground water discharge from the adjacent uplands. Ponding or wet conditions near the surface during much of the summer appear to be the most important characteristic of this site.

In the Gulkana River area, this site is of moderate extent. It occurs along the entire length of the West Fork and along the lower reaches of the Main Stem. This site probably occurs elsewhere in the Copper River basin also.

**Table 2. Representative physiographic features**

Landforms	(1) Terrace
Flooding frequency	None
Ponding duration	Long (7 to 30 days)
Elevation	579–762 m
Slope	0–8%
Ponding 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 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 soils on this site are formed in moderately thick to thick organic materials over loamy alluvium and lacustrine deposits. The surface organic mat typically ranges from about 7 to 34 inches (18 to 86 cm) thick in the inter-hummock depressions and from 16 to over 40 inches (41 to 102 cm) within the hummocks. The seasonal high water table ranges from as much as 10 inches (25 cm) of ponding to a depth of 10 inches (25 cm) below the surface and the soils are very poorly drained. Depth to permafrost ranges from within the organic material to 38 inches (97 cm) below the mineral surface. Aquic conditions including reduced matrices and saturation are present within 10 inches (25 cm) of the surface.

Additional soil phases include: Pergelic Cryohemist, Mendna, very wet; Kuslinad, very wet; Haggard; and Cryaquepts, very wet.

**Table 4. Representative soil features**

Family particle size	(1) Loamy
Available water capacity (0-101.6cm)	0.36–0.89 cm

### Ecological dynamics

Wild fire impacts and post-fire succession on this site are complex and difficult to predict. Because of the landscape position and moisture status of the site, the vegetation probably would be susceptible to burning only during extended dry periods. Because this site receives a surplus of water as surface run-in and ground water discharge from the adjacent uplands, it should always be considerably wetter than surrounding areas. Although an increase in the depth to permafrost could occur following a fire, soil drainage probably would be poor because of topography and permafrost and the site would remain wet.

Cottongrass tussocks would be expected to most impacted by fire. The degree to which *Eriophorum brachyantherum* can survive severe burning is not known. Soil and site characteristics in areas with the best tussock development suggests that their development requires a degree of site stability. A best guess is that burning would favor an increase in sedges and dwarf shrubs and a decrease in cottongrass tussocks for an indeterminate period of time. Following light to moderate burning, Low shrub birch/closed sheath cottongrass scrub would develop on this site. Tree regeneration, primarily *Picea mariana*, would be expected to occur slowly.

### State and transition model

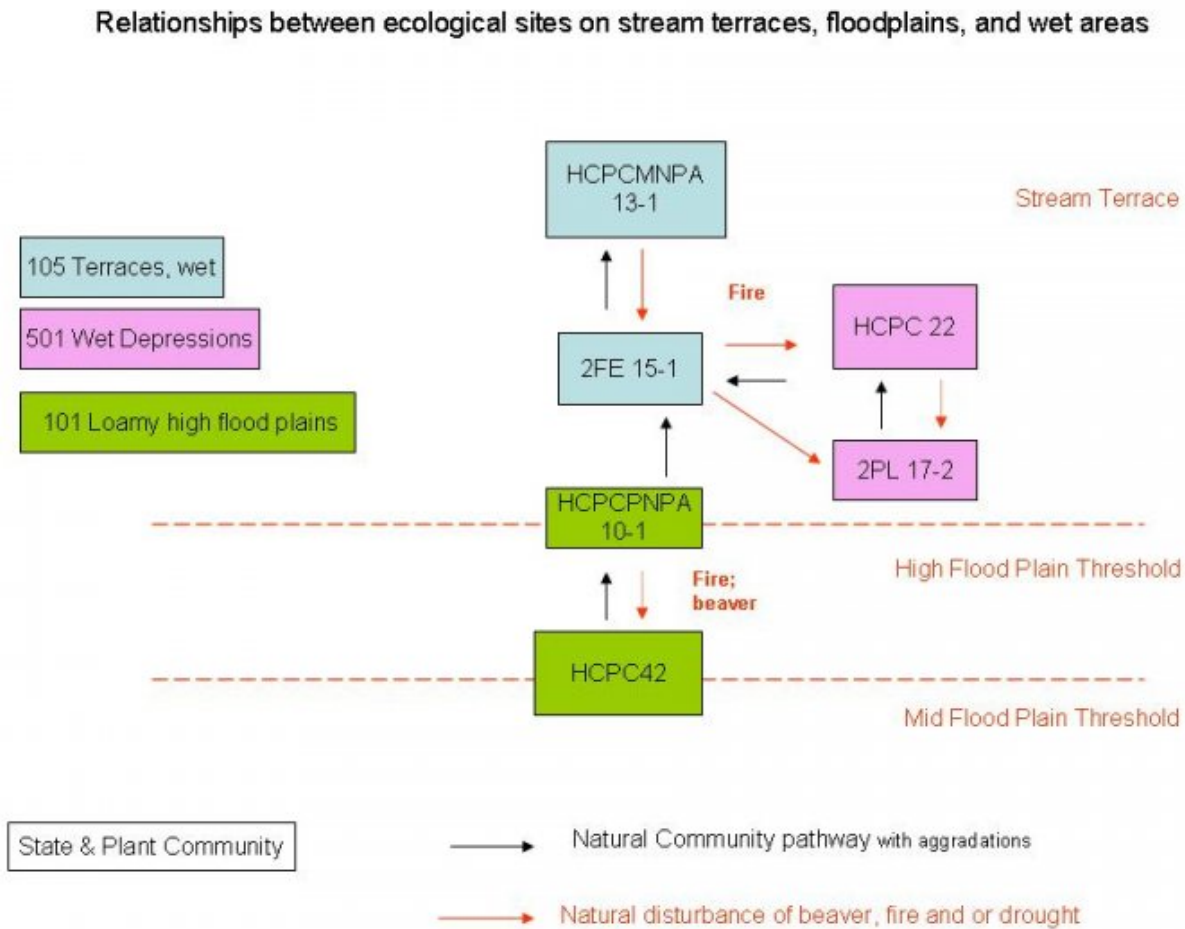


Figure 3. Terraces, wet and Frozen

### State 1 Low Shrub Birch/closed sheath cottongrass scrub

## Community 1.1

### Low Shrub Birch/closed sheath cottongrass scrub

Low shrub birch/closed sheath cottongrass scrub is dominated by moderately dense to dense *Eriophorum brachyantherum* tussocks, with an open to moderately closed overstory of low and dwarf shrubs and scattered stunted trees and tree regeneration. Low shrub birch/closed sheath cottongrass scrub is probably late seral vegetation on nearly level and concave sites that have remained undisturbed by wildfire for an extended period of time. In many places, this type is a seral stage leading to Black spruce/ closed sheath cottongrass woodland. Both types are often in association with one another on the same landforms and soils. 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 (Cowardin et al. 1979)

**Forest overstory.** Tree canopy cover ranges from 10 to occasionally 45 percent. 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.** Tussock cover ranges from 25 to 85 percent. In areas of the best development, tussocks range from 9 to 30 inches (23 to 76 cm) in height with spacing between tussocks of 8 to 16 inches (20 to 41 cm). Where tussock development is weaker, other sedges are common among the tussocks. The most frequently occurring sedges are *Carex aquatilis* and *C. lugens*.

Canopy cover of the scrub layer typically ranges from 20 to 60 percent. In some stands with weak tussock development, scrub cover occasionally exceeds 75 percent. Important low and dwarf shrubs include *Betula glandulosa*, *Ledum* spp., *Vaccinium uliginosum*, *V. vitis-idaea*, *Salix planifolia*, and *Andromeda polifolia* in some stands. *Picea mariana*, and to a lesser extent *P. glauca*, are common in most stands. Trees are usually less than 15 feet (less than 4.6 m) in height and form less than 10 percent canopy cover. Tree regeneration is well-represented in some stands.

Except for *Rubus chamaemorus*, *Petasites frigidus*, and *Arctagrostis latifolia*, other herbs are uncommon in Low shrub birch/closed sheath cottongrass scrub. *R. chamaemorus* forms a moderately open cover in occasional stands. Throughout Low shrub birch/closed sheath cottongrass scrub, mosses, in particular *Sphagnum*, cover much of the soil surface, and ponded water and saturated conditions are common between the tussocks.

Table 5. Ground cover

Tree foliar cover	1-45%
Shrub/vine/liana foliar cover	1-65%
Grass/grasslike foliar cover	1-80%
Forb foliar cover	1-40%
Non-vascular plants	1-100%
Biological crusts	0%
Litter	1-50%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	1-7%

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	–	–	15-75%	15-75%
>0.6 <= 1.4	–	25-70%	–	–
>1.4 <= 4	10-45%	–	–	–
>4 <= 12	–	–	–	–
>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

## State 2

### Black spruce/closed sheath cottongrass woodland

#### Community 2.1

##### Black spruce/closed sheath cottongrass woodland

Black Spruce/closed sheath cottongrass woodland is the correlated PNC on this site. Black spruce/closed sheath cottongrass woodland consists of woodland to open stands of stunted, small diameter *Picea mariana*. Black spruce/closed sheath cottongrass woodland is late seral 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 Status Classification: Palustrine needle-leaved evergreen scrub-shrub, saturated, organic (Cowardin et al. 1979)

**Forest overstory.** Tree canopy cover ranges from 10 to occasionally 45 percent. 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.

#### Setting

Distribution and extent: widely distributed throughout the uplands and River corridor; moderate extent

Elevation: 1,850 to 3,000 feet (564 to 914 m)

Landforms: nearly level to occasionally moderately sloping lacustrine terraces and level stream terraces

Principal soils: Kuslinad, very wet; Klasi, very wet; Mendna, very wet; Pergelic Cryohemists; and Haggard (The

thickness of the surface organic mat ranges from 8 to 25 inches [20 to 64 cm] in most stands.)

**Table 7. Ground cover**

Tree foliar cover	40%
Shrub/vine/liana foliar cover	5-30%
Grass/grasslike foliar cover	1-55%
Forb foliar cover	1-2%
Non-vascular plants	5-60%
Biological crusts	0%
Litter	10%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

**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

### Recreational uses

The hummocky microtopography and wet characteristics of this site makes for extremely difficult walking when crossing areas of this site. Soil conditions result in severe limitations for trails.

### Other information

Wild fire impacts and post-fire succession on this site are complex and difficult to predict. Because of the landscape position and moisture status of the site, the vegetation probably would be susceptible to burning only during extended dry periods. Because this site receives a surplus of water as surface run-in and ground water discharge from the adjacent uplands, it should always be considerably wetter than surrounding areas. Although an increase in the depth to permafrost could occur following a fire, soil drainage probably would be poor because of topography and permafrost and the site would remain wet.

Cottongrass tussocks would be expected to be most impacted by fire. The degree to which *Eriophorum brachyantherum* can survive severe burning is not known. Soil and site characteristics in areas with the best tussock development suggests that their development requires a degree of site stability. A best guess is that burning would favor an increase in sedges and dwarf shrubs and a decrease in cottongrass tussocks for an indeterminate period of time. Following light to moderate burning, Low shrub birch/closed sheath cottongrass scrub would develop on this site. Tree regeneration, primarily *Picea mariana*, would be expected to occur slowly. This site is not known to represent a progressive stage of similar or adjoining sites, in particular ecological sites 172Xy103AK - Stream Terraces, Frozen and 172Xy107AK - Glaciolacustrine Uplands, Frozen. Transitional area between these sites and ecological site 172Xy105AK - Terraces, Wet are common, however, throughout the Gulkana River Area.

(2) Degradation: Given that the soil surface is mantled with a moderately thick to thick layer of organic material throughout this site, dramatic changes in the characteristics of this site might be expected following severe wild fire during extremely dry years. The surface organic material could become highly susceptible to burning if there was a

significant drop in the level of the water table during prolonged dry conditions. Ground fires under such conditions could burn into the organic mat to a considerable degree and conceivably result in a lowering of the base elevation of the surface. Later, when the water table once again rose to more normal levels, conditions may be suitable for the development of sedge wet meadow vegetation and site characteristics more typical of ecological site 172Xy501AK - Wet Depressions. Whether changes of this magnitude as a result of wild fire have in fact ever occurred is not known.

## Inventory data references

Soil and Vegetation Survey of the Gulkana River Area, AK, Clark M.H. and Kautz, D.R. USDOI, BLM-Alaska Technical Report 20, August 1999

## 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:**
- 
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:**
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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):**
- 
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:**

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