USDA Natural Resources Conservation Service

Ecological site R227XY200AK
Gravelly Flood Plains, Moderately Wet Tangoe; Tangoe wet, occasionally flooded

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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.

Associated sites

F227XY101AK	**Loamy High Flood Plains Hogan cool, Hogan, Klute, Kluna, Tangoe occasionally flooded, and Klute occasionally flooded**
F227XY103AK	**Stream Terraces Frozen Kuslinad**
R227XY205AK	**Loamy Flood Plain, Wet Tangoe, wet; Swedna, high elevation**
R227XY500AK	**Loamy Riverbanks Swedna, very poorly drained;Aquatna**

Similar sites

R227XY205AK	**Loamy Flood Plain, Wet Tangoe, wet; Swedna, high elevation**
R227XY201AK	**Loamy Flood Plains, Moderately Wet Dackey Cool; Swedna; Sankluna;Ogtna**

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site consists of level to gently sloping flood plains formed in a very thin mantle of stratified alluvium over gravelly and cobbly alluvium along clear water rivers and streams. Terrace height above the mean summer channel level is typically 3 feet (0.6 m) or less and the site is frequently to occasionally flooded. In some places, the site is cut with shallow, narrow ephemeral and perennial channels. Elevation is generally from 2500 to 2850 feet (762 to 869 m).

In the Gulkana River area, this site occurs primarily along the Middle Fork, along the Main Stem from the outlet of Paxson Lake to the Middle Fork confluence, and along Keg Creek on the North Branch. It also occurs in small, isolated areas throughout the remainder of the River corridor. This site undoubtedly occurs along moderate to steep gradient reaches of the other non-glacial streams and rivers elsewhere in the Copper River basin.

Table 2. Representative physiographic features

Landforms	(1) Flood plain
Flooding duration	Brief (2 to 7 days) to long (7 to 30 days)
Flooding frequency	Frequent
Elevation	762–869 m
Slope	0–3%
Water table depth	30–76 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

: The weakly developed soils on this site typically have a mantle of stratified sandy and silty alluvium less than 8 inches (20 cm) thick over very gravelly and cobbly alluvium. The surface organic mat ranges from 0 to 1 inch (0 to 2.5 cm) thick. Depth to seasonal high water table ranges from 12 to 40 inches (30 to 102 cm) and the soils are somewhat poorly drained. During periods of peak snowmelt and runoff, the water table is at or near the soil surface. On the lowest flood plain positions, the water table may remain near the surface most of the growing sea

Table 4. Representative soil features

Surface texture	(1) Sandy loam (2) Sand (3) Silt
Family particle size	(1) Sandy

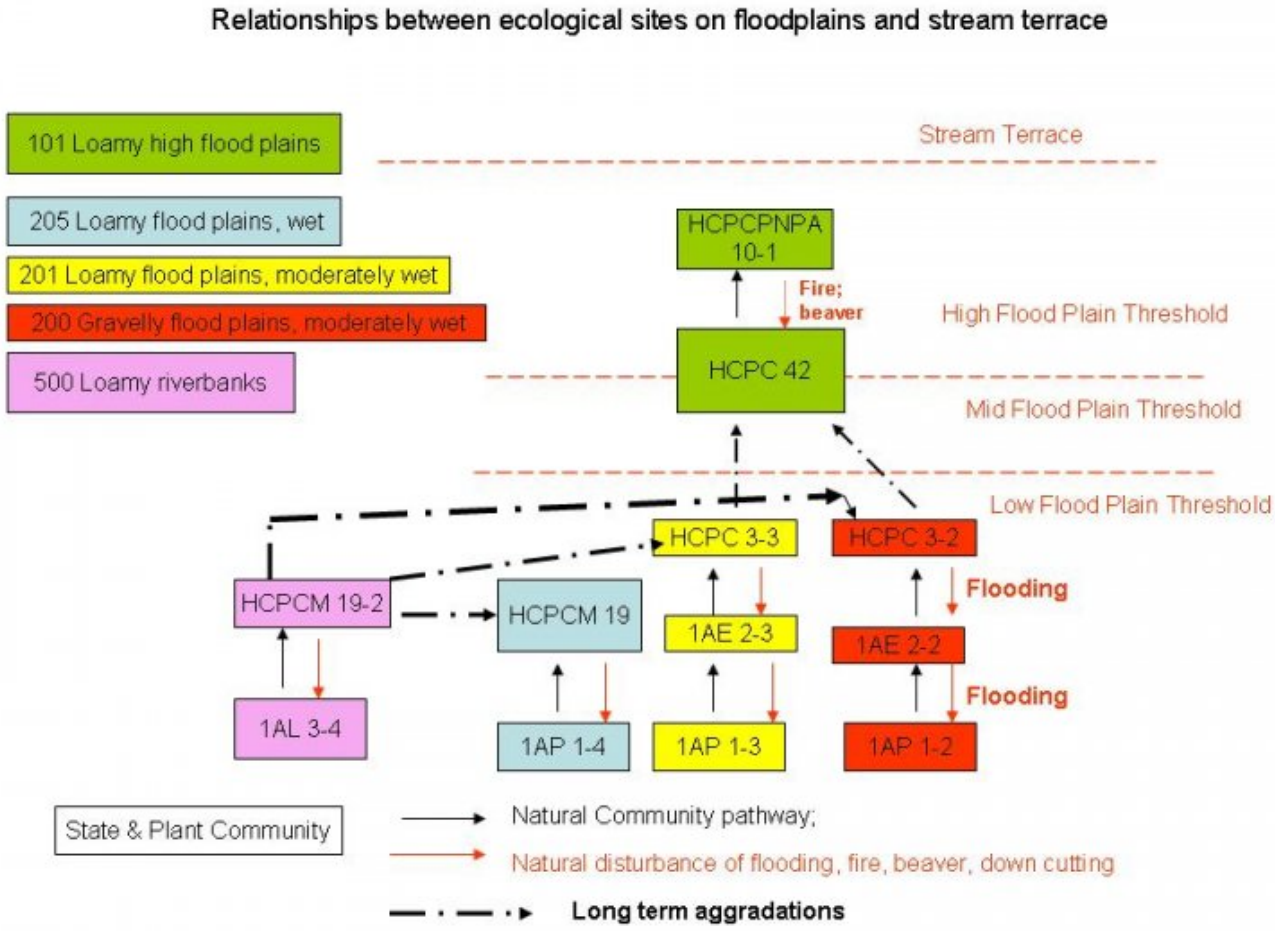
Drainage class	Somewhat poorly drained
Soil depth	152 cm
Available water capacity (0-101.6cm)	0.05–0.46 cm
Subsurface fragment volume >3" (Depth not specified)	35–50%

Ecological dynamics

Tall feltleaf willow scrub is an early and apparently short lived seral stage on this site. Most stands of this type are of small extent and usually restricted to gravelly bars within and along the margins of the river channel. Otherwise, Low willow/herb scrub is the predominant vegetation type found on this site. On slightly higher terrace positions, white spruce seedlings and small saplings are frequently found within the Low willow/herb scrub. In a few places, small stands of White spruce/willow open forest occur also.

This site is probably only moderately susceptible to wild fire. Wet soil conditions should limit the severity of burning, allowing the willow scrub to regenerate quickly from root sprouts.
Based on observations and data collected in the Gulkana River area, this site is best described as an early stage of site progression and vegetation succession on flood plains along moderate to steep gradient stream channels. Down-cutting by the channel and continued surface deposition of alluvium will over time raise the terrace height, increase the thickness of the fine textured alluvium on the soil surface, and cause other changes in site and soil properties. Site progression appears to lead to 172Xy101AK - Loamy High Flood Plains and White spruce/willow open forest vegetation. Near the upper elevational limit of 172Xy200AK - Gravelly Flood Plains, Moderately Wet the potential for trees is probably limited to occasional scattered trees and clumps of trees on favorable microsites. In these areas, site progression appears to lead to 172Xy201AK - Loamy Flood Plains, Moderately Wet and continued Low willow/herb scrub vegetative potential.

State and transition model



State 1
Low willow/herb scrub

Community 1.1
Low willow/herb scrub

Low willow/herb scrub is the correlated Potential Natural Plant Community on this site. In most places, this PNC is best characterized as a riparian association, which develops and persists under a regime of intermittent fluvial disturbance. In the Gulkana River Area, the upper elevational limit of this site, which corresponds with the upper elevational limit of the survey area within the river corridor, may be above the limit of tree growth. In this situation, the PNC probably represents the long term vegetative potential. Low willow/herb scrub occurs from above treeline down into the forest zone, and successional status varies from potential to early seral vegetation depending on the site. Within the forest zone, most stands have uncommon to common *Picea glauca* and often *Populus balsamifera* seedlings, saplings, and small trees. With forest development, terrace height usually increases from channel migration and down-cutting. Flooding frequency decreases and the soils become better drained. Along the Middle Fork immediately below Dickey Lake, Low willow/herb scrub is potential vegetation or possibly seral to Low shrub birch scrub, which replaces the willow on stream terraces as terrace height increases and periodic flooding ceases. In many places, Low willow/herb scrub occurs in close proximity with, and is transitional to, Low willow/water sedge scrub. Flooding is less frequent and of shorter duration in Low willow/herb scrub compared with Low willow/water sedge scrub. Also, surface ponding is less prevalent in Low willow/herb scrub.

Forest understory. Low willow/herb scrub consists of moderately open to closed willow 2 to 7 feet (0.6 to 2.1 m) in height with a moderately closed to closed herb layer. Low shrub canopy cover ranges from 40 to 95 percent. Dominant shrubs include Salix planifolia, S. barclayi, and often S. monticola. S. alaxensis forms an open tall shrub layer in some stands. Other low shrubs are relatively unimportant except for Potentilla fruticosa and Vaccinium

uliginosum. In most stands, the herb layer is composed of a rich variety of species. Herb and dwarf shrub canopy cover is typically greater than 80 percent. Occasionally the herb layer is only sparse to open. Important herbs include Calamagrostis canadensis, Epilobium angustifolium, Equisetum spp., Mertensia paniculata, Polemonium acutiflorum, Swertia perennis, and often Carex aquatilis. Rubus arcticus and Salix reticulata are common dwarf shrubs in many stands. The ground surface is covered with feathermoss patches and herbaceous and woody litter.

Table 5. Ground cover

Tree foliar cover	1-7%
Shrub/vine/liana foliar cover	1-75%
Grass/grasslike foliar cover	1-20%
Forb foliar cover	1-25%
Non-vascular plants	15-35%
Biological crusts	0%
Litter	1-70%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	1%
Bedrock	0%
Water	0%
Bare ground	1-2%

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	–	–	1-15%	1-15%
>0.6 <= 1.4	–	65-85%	–	–
>1.4 <= 4	–	–	–	–
>4 <= 12	0-7%	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

State 2
Tall feltleaf willow scrub

Community 2.1
Tall feltleaf willow scrub

Tall feltleaf willow scrub consists of open to moderately closed willow 7 to 15 feet (2.1 to 4.6 m) in height. Lower layers include a sparse to moderately closed low willow layer and an open to moderately closed herb layer. Feltleaf willow is a rapidly growing pioneering species on flood plains, and well adapted to frequent flooding and siltation. This species also appears to be relatively short lived and intolerant of canopy competition. Tall feltleaf willow scrub is an early seral stage of flood plain succession in both the alder and willow zones. Within the willow zone, this cover type typically occurs as stands of small extent on gravelly and silty bars immediately adjacent to the channel. Within the alder zone, Tall feltleaf willow scrub along with Tall feltleaf willow/alder scrub occur spatially and successionally between Sparsely vegetated alluvium and the Thinleaf alder scrub cover types. Riparian-Wetland Status Classification: Palustrine scrub-shrub, seasonally flooded, mineral (Cowardin et al. 1979); riparian

Forest understory. The tall willow is composed entirely of Salix alaxensis—canopy cover ranges from 25 to 70 percent. The low shrub layer ranges from 10 to 70 percent canopy cover and is composed primarily of S. barclayi and S. planifolia. Potentilla fruticosa and Vaccinium uliginosum are present in most stands, but other shrubs are generally of minor importance. The composition and abundance of the herb layer is variable, depending on stand location relative to the river channel and the frequency and duration of flooding. Herb cover ranges from 30 to 60 percent in most stands. Important herbs include Calamagrostis canadensis, Equisetum spp., Epilobium angustifolium, Hedysarum alpinum, Parnassia palustris, and Rubus arcticus. Leaf litter, woody debris, and small patches of moss cover most of the soil surface. Picea glauca and Populus balsamifera seedlings are occasional to common in many stands.

Table 7. Ground cover

Tree foliar cover	1-15%
Shrub/vine/liana foliar cover	1-25%
Grass/grasslike foliar cover	1-4%
Forb foliar cover	1-7%
Non-vascular plants	10-40%
Biological crusts	0%
Litter	15%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	60%
Bedrock	0%
Water	0%
Bare ground	1%

State 3
Sparsely vegetated alluvium

Community 3.1
Sparsely vegetated alluvium

Table 8. Ground cover

Tree foliar cover	10-35%
Shrub/vine/liana foliar cover	1-55%
Grass/grasslike foliar cover	1%
Forb foliar cover	1%
Non-vascular plants	2-30%
Biological crusts	0%
Litter	60%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	1%

Table 9. Soil surface cover

Tree basal cover	1-15%

Shrub/vine/liana basal cover	1-70%
Grass/grasslike basal cover	2-40%
Forb basal cover	1-60%
Non-vascular plants	1-50%
Biological crusts	0%
Litter	1-80%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	1-3%

Additional community tables

Animal community

This site provides excellent winter habitat for moose. Willow browse is dense and most stands exhibit moderate to severe hedging. Beaver use of the willow is evident in many stands. Uses include forage and dam building materials.

Other information

In many places, insect gall are common on willows. The insect(s) associated with these galls is not known. Most stands experience seasonally heavy browsing by moose and the willow is usually moderately to occasionally severely hedged. Beaver cut willow stems are common throughout many stands.

As currently defined, site 200 is generally below treeline; site progression from low flood plains toward high flood plains is accompanied by vegetation succession toward White spruce/willow woodland. Treeline, however, appears to occur at about 2500 feet elevation, just below the elevation of Dickey Lake on the upper Middle Fork.

During initial field work in the Tangle Lakes portion of the Delta River Area, gravelly flood plains with Low willow/herb scrub were found in number of places. These site/stands are probably entirely above the elevation of tree growth and woodland potential. These sites/stands also are similar to ones found immediately below Dickey Lake in the Gulkana River Area.

In conjunction with the Delta River Area project, a new site will have to be defined to include gravelly flood plains above treeline. On this new site, Low willow/herb scrub would still be the potential during site progression toward higher flood plains. Dickey Lake area sites/stands currently included in site 200 would be correlated to the new site.

Type locality

Location 1: Valdez-Cordova County, AK	
Township/Range/Section	T12 R2 S05

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):

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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:**
