USDA Natural Resources Conservation Service

Ecological site F236XY111AK
Boreal Forest Loamy Flood Plains

Last updated: 2/07/2024
Accessed: 05/04/2024

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.

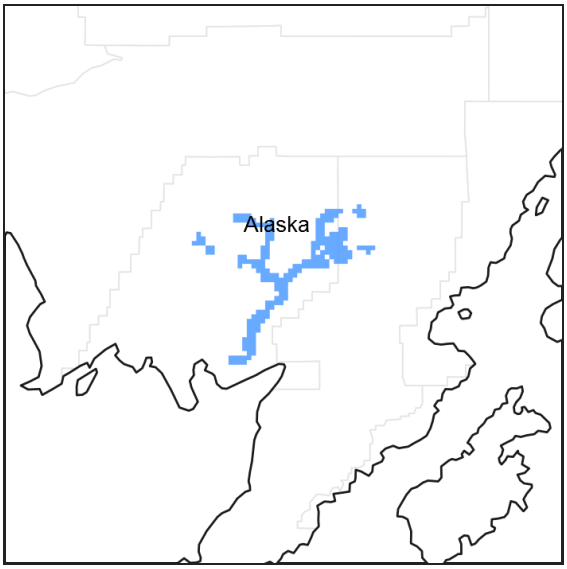


Figure 1. Mapped extent

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.

MLRA notes

Major Land Resource Area (MLRA): 236X–Bristol Bay-Northern Alaska Peninsula Lowlands

The Bristol Bay-Northern Alaska Peninsula Lowland Major Land Resource Area (MLRA 236) is located in Western Alaska. This MLRA covers approximately 19,500 square miles and is defined by an expanse of nearly level to rolling lowlands, uplands and low to moderate hills bordered by long, mountain footslopes. Major rivers include the Egegik, Mulchatna, Naknek, Nushagak, and Wood River. MLRA 236 is in the zone of discontinuous permafrost. It is primarily in areas with finer textured soils on terraces, rolling uplands and footslopes. This MLRA was glaciated during the early to middle Pleistocene. Moraine and glaciofluvial deposits cover around sixty percent of the MLRA. Alluvium and coastal deposits make up a large portion of the remaining area (Kautz et al., 2012; USDA, 2006).

Climate patterns across this MLRA shift as one moves away from the coast. A maritime climate is prominent along the coast, while continental weather, commonly associated with Interior Alaska, is more influential inland. Across the MLRA, summers are general short and warm while winters are long and cold. Mean annual precipitation is 13 to 50 inches, with increased precipitation at higher elevations and areas away from the coast. Mean annual temperatures is between 30 and 36 degrees F (USDA, 2006).

The Bristol Bay-Northern Alaska Peninsula MLRA is principally undeveloped wilderness. Federally managed land includes parts of the Katmai and Aniakchak National Parks, and the Alaska Peninsula, Becharof, Togiak and Alaska Maritime National Wildlife Refuges. The MLRA is sparsely populated. Principal communities include Dillingham,

Naknek, and King Salmon. Commercial fishing in Bristol Bay and the Bering Sea comprises a major part of economic activity in the MLRA. Other land uses include subsistence activities (fishing, hunting, and gathering) and sport hunting and fishing (USDA, 2006).

Ecological site concept

This boreal ecological site is on high flood plains, which are defined relative to low flood plains. High flood plains are typically further from the flood source, and flood less frequently and with less scouring energy than low flood plains. Water run-in via precipitation and snow melt are the main sources of water on this site. Site elevation ranges from sea level to 580 feet. Slopes gradients are nearly level (0 – 2 percent). Soils are predominantly well drained silt and silt loams atop sandy or gravelly parent material. Soil and site characteristics and a flooding regime shape the vegetative communities.

The reference state supports four communities. The reference community phase is a mixed forest (Viereck et al., 1992) with an open understory of bluejoint grass (*Calamagrostis canadensis*) and diverse forbs and shrubs. An alternative state is associated with beaver (Castor canadensis) ponds.

Associated sites

F236XY150AK	**Boreal Forest Loamy Wet Flood Plains** Ecological site F236XY150AK (Boreal Forest Loamy Flood Plains, Wet) is on boreal high flood plains. It is subject to occasional, brief periods of ponding due to the concave positions of the site, proximity to wetland, and poorly drained soils. Ecological site F236XY111AK is not in concave areas and is subject to rare periods of ponding.

Similar sites

F236XY150AK	**Boreal Forest Loamy Wet Flood Plains** Ecological site F236XY150AK (Boreal Forest Loamy Flood Plains, Wet) is on boreal high flood plains. It is subject to occasional, brief periods of ponding due to the concave positions of the site, proximity to wetland, and poorly drained soils. Ecological site F236XY111AK is not in concave areas and is subject to rare periods of ponding.

Table 1. Dominant plant species

Tree	(1) *Picea glauca* (2) *Betula papyrifera*
Shrub	(1) *Rubus arcticus* (2) *Viburnum edule*
Herbaceous	(1) *Calamagrostis canadensis* (2) *Dryopteris expansa*

Physiographic features

This boreal ecological site is on high flood plains of lowlands. It ranges from sea level to 580 feet in elevation, and it has nearly level slopes (0 to 2 percent). Aspect does not influence the plant community dynamics of this site. Flooding is the major disturbance in this ecological site. It is a very rare to occasional event.

Table 2. Representative physiographic features

Landforms	(1) Valley > Flood plain
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	Very rare to rare
Ponding frequency	Rare
Elevation	0–177 m
Slope	0–2%

Water table depth	3–10 cm
Aspect	W, NW, N, NE, E, SE, S, SW

Table 3. Representative physiographic features (actual ranges)

Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Very rare to occasional
Ponding frequency	Rare to frequent
Elevation	0–475 m
Slope	0–5%
Water table depth	3–10 cm

Climatic features

The climate of this site reflects that of the MLRA, which is described as maritime polar (EPA, 2013). Temperatures are moderated by the nearby Bristol Bay and norther Pacific bodies of water. Annual precipitation ranges from 21 – 34 inches with approximately 40 percent occurring during the June-September growing season (PRISM, 2018).

Table 4. Representative climatic features

Frost-free period (characteristic range)	75-100 days
Freeze-free period (characteristic range)	65-90 days
Precipitation total (characteristic range)	533-864 mm
Frost-free period (actual range)	75-100 days
Freeze-free period (actual range)	65-90 days
Precipitation total (actual range)	381-1,041 mm
Frost-free period (average)	90 days
Freeze-free period (average)	75 days
Precipitation total (average)	737 mm

Influencing water features

This site is influenced by riparian water features. Water run-in via precipitation and snow melt are the main sources of water. The braided water system in this ecological site is a riverine, lower perennial system with an unconsolidated or rock bottom (Cowardin et al., 1979).

Soil features

The alluvial soils of this site are Inceptisols. These soils are relatively young with weak development (Soil Survey Staff, 2013). Soils support a cryic temperature regime.

Soils with sandy and gravelly alluvium parent material are found throughout the floodplain. These soils are well drained with an udic moisture regime and they acquire a minimally developed ochric surface horizon. Loamy soils develop where fine materials are deposited. These areas coincide with level slopes at low elevations and along low energy side channels. Soils are poorly drained with an aquic moisture regime.

Correlated soil components: D36-Boreal forest loamy flood plains, D36-Boreal forest loamy flood plains high, and Kokwok and Iowithla soils

Table 5. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Silt (2) Silt loam
Family particle size	(1) Coarse-loamy
Drainage class	Well drained
Permeability class	Moderate
Soil depth	152 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-25.4cm)	4.57–5.33 cm
Soil reaction (1:1 water) (0-25.4cm)	5–6.1
Subsurface fragment volume <=3" (Depth not specified)	0–85%
Subsurface fragment volume >3" (Depth not specified)	0%

Table 6. Representative soil features (actual values)

Drainage class	Poorly drained to well drained
Permeability class	Moderate to very rapid
Soil depth	152 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-25.4cm)	4.06–6.1 cm
Soil reaction (1:1 water) (0-25.4cm)	4.2–6.1
Subsurface fragment volume <=3" (Depth not specified)	0–85%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

This site is on high flood plains. Local site factors, including microtopographic elevation, soil characteristics, and flood energy create four co-occurring vegetative communities. The reference plant community is a mixed birch and white spruce forest. Gravelly soils are more likely to support more trees than shrubs, while the opposite is true for loamy soil. Areas that experience high energy flood events are most likely to support scrublands and meadows of resilient shrubs and fast growing herbaceous species

Spatial and temporal patterns in soil and site hydrology create four flood plain communities. Flood events do not prevent tree growth on areas distal from the river channel. Vegetation on low areas along main river channels is influenced by scouring from relatively high energy flooding and ice bulldozing. Plants are primarily resilient shrubs and fast growing herbaceous species. Loamy soils are poorly drained and are typically not scoured. These localized areas support hydrophytic vegetation along with sporadic trees.

Changes in hydrology due to the movement of river channels can shift one community to the other. Scouring of loamy soil may expose existing gravels and deposit new gravels, creating better drained soil. Channel movement

also creates areas of low flood energy, allowing fine material deposits to accumulate and changing soil hydrology. These changes are slow and dictated by movement of a river across a floodplain.

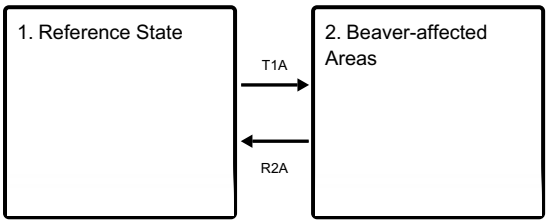
Windthrow has been observed in the reference plant community. It may contribute to keeping the forest canopy open and promoting plant diversity in the understory. Willows are browsed by moose. This does not appear to affect the ecological processes of the site.

Beaver-affected areas are described by an alternate state. In these areas, Alaska paper birch (*Betula neoalaskana*), bluejoint (*Calamagrostis canadensis*), and hydrophilic forbs typically surround the ponds upstream of the beaver dam. It is unknown if the pond will naturally return to the reference state after dam removal.

The information in this Ecological Dynamics section, including the state-and-transition model (STM), was developed based on current field data, professional experience, and a review of the scientific literature. As a result, all possible scenarios or plant species may not be included. Key indicator plant species, disturbances, and ecological processes are described to inform land management decisions.

State and transition model

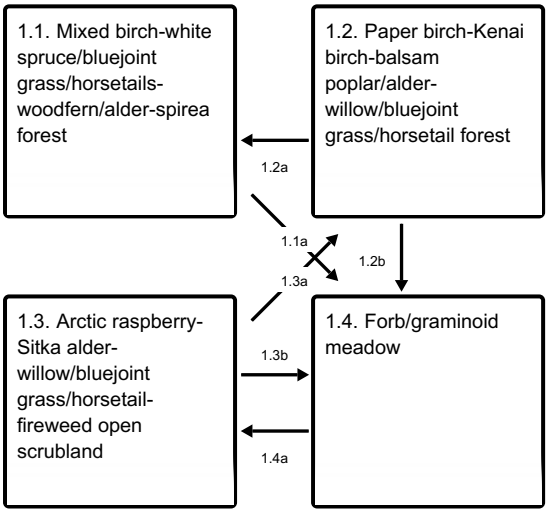
Ecosystem states



T1A - Beaver activity

R2A - Beaver dam removal

State 1 submodel, plant communities



1.1a - Flooding

1.2a - Natural succession: Normal time and growth without disruptive flooding.

1.2b - Flooding

1.3a - Natural succession: Normal time and growth without disruptive flooding.

1.3b - Flooding

1.4a - Natural succession: Normal time and growth without disruptive flooding.

State 2 submodel, plant communities

2.1. Paper birch/bluejoint grass/tealeaf willow/horsetails-purple marshlocks woodland

State 1
Reference State

The reference state supports four community phases, which are grouped by the structure and dominance of the vegetation (e.g., coniferous trees, deciduous trees, shrubs, and forbs) and by their ecological function and stability. The presence of these communities is temporally dictated by rare periods of flooding. The reference community phase is a mixed forest and an open understory of bluejoint grass (*Calamagrostis canadensis*) and diverse forbs and shrubs. An alternative state is caused by the damming of nearby drainageways or streams by beavers (Castor canadensis).

Community 1.1
Mixed birch-white spruce/bluejoint grass/horsetails-woodfern/alder-spirea forest

Figure 8. Typical area of community 1.1.

The reference community phase for this ecological site is characterized by a mixed coniferous and deciduous forest and an open understory of bluejoint grass (*Calamagrostis canadensis*) and diverse forbs and shrubs. The majority of the tree cover is in the tall and medium strata. Typically, the dominant species are white spruce (*Picea glauca*) and paper birch (*Betula papyrifera*), but other trees such as Alaska paper birch (*Betula neoalaskana*), Kenai birch (*Betula papyrifera* var. kenaica), and balsam poplar (*Populus balsamifera*) may be present. The dominant understory species include bluejoint grass (*Calamagrostis canadensis*), arctic raspberry (*Rubus arcticus*), spreading woodfern (*Dryopteris expansa*), and horsetails (Equisetum spp.). Other less abundant species may include highbush cranberry (*Viburnum edule*), alder (Alnus spp.), and spirea (*Spiraea stevenii*). Feathermosses, such as splendid feathermoss (*Hylocomium splendens*) and knights plume moss (*Ptilium crista-castrensis*), commonly are on the surface along with a minor amount of lichens. Other ground cover commonly includes herbaceous litter (about 65 percent average cover) and woody litter (about 9 percent average cover). About 1 percent is bare soil.

Dominant plant species

- white spruce (*Picea glauca*), tree
- paper birch (*Betula papyrifera*), tree
- squashberry (*Viburnum edule*), shrub
- bluejoint (*Calamagrostis canadensis*), grass

Community 1.2
Paper birch-Kenai birch-balsam poplar/alder-willow/bluejoint grass/horsetail forest

Figure 9. Typical area of community 1.2.

Community Phase Canopy Cover

(Vegetation data in the table are provided as constancy (percent) and average canopy cover (percent) of the most dominant and ecologically relevant species for this community phase.)

Plant group	Common name	Scientific name	USDA plant code	Constancy (percent)	Average canopy cover (percent)
T	Paper birch	*Betula papyrifera*	BEPA	42	50'
T	Kenai birch	*Betula papyrifera* var. *kenaica*	BEPAK	29	45'
T	Balsam poplar	*Populus balsamifera*	POBA2	67	40'
S	Alder	*Alnus spp.*	ALNUS	38, 29*	25, 20
S	Arctic raspberry	*Rubus arcticus*	RUAR	67	6
G	Bluejoint grass	*Calamagrostis canadensis*	CACA4	100	60
F	Horsetails	*Equisetum spp.*	EQUIS	46, 17, 58#	15, 40, 20
F	Arctic starflower	*Trientalis europaea*	TREU	71	1
F	Northern bedstraw	*Galium boreale*	GABO2	63	3

* Tall, medium, and stunted individuals are counted as canopy trees. Regenerative individuals are not included.

^ Alders (*Alnus spp.*) are represented by two species—*A. incana* ssp. *tenuifolia* and *A. viridis* ssp. *sinuata*, respectively.

Horsetails (*Equisetum spp.*) are represented by three species—*E. arvense*, *E. pretense*, and *E. sylvaticum*, respectively.

Figure 10. Constancy and canopy cover of plant species in community 1.2.

This late flooding community phase is characterized by a deciduous forest and an understory of dominantly bluejoint grass (*Calamagrostis canadensis*) and various shrubs and forbs. Commonly, two or more deciduous species are present, including balsam poplar (*Populus balsamifera*), paper birch (*Betula papyrifera*), Kenai birch (*Betula papyrifera* var. kenaica), and Alaska paper birch (*Betula neoalaskana*). The understory commonly includes bluejoint grass (*Calamagrostis canadensis*), arctic raspberry (*Rubus arcticus*), alder (Alnus spp.), and horsetails (Equisetum spp.). Other less common understory species include various shade-tolerant, competitive forbs such are arctic starflower (*Trientalis europaea*), spreading woodfern (*Dryopteris expansa*), fireweed (*Chamerion angustifolium*), and western touch-me-not (*Impatiens noli-tangere*) and colonizing highbush cranberry (*Viburnum edule*). The ground cover commonly consists of patchy mosses (about 20 percent average cover) and a minor component of lichens (about 1 percent). Other ground cover commonly includes herbaceous litter (about 80 percent average cover) and woody litter (about 8 percent). About 1 percent is bare soil.

Community 1.3
Arctic raspberry-Sitka alder-willow/bluejoint grass/horsetail-fireweed open scrubland

Figure 11. Typical area of community 1.3.

Community Phase Canopy Cover

(Vegetation data in the table are provided as constancy (percent) and average canopy cover (percent) of the most dominant and ecologically relevant species for this community phase.)

Plant group	Common name	Scientific name	USDA plant code	Constancy (percent)	Average canopy cover (percent)
S	Alder	*Alnus spp.*	ALNUS	33, 33^	40, 45
S	Tealeaf willow	*Salix pulchra*	SAPU15	50	10
S	American red raspberry	*Rubus idaeus*	RUID	83	15
G	Bluejoint grass	*Calamagrostis canadensis*	CACA4	100	60
F	Horsetails	*Equisetum spp.*	EQUIS	33, 50, 50#	8, 30, 30
F	Spreading woodfern	*Dryopteris expansa*	DREX2	67	15
F	Tall Jacob's-ladder	*Polemonium acutiflorum*	POAC	67	1

^ Alders (*Alnus spp.*) are represented by two species—*A. incana* ssp. *tenuifolia* and *A. viridis* ssp. *sinuata*.

Horsetails (*Equisetum spp.*) are represented by three species—*E. arvense*, *E. pretense*, and *E. sylvaticum*, respectively.

Figure 12. Constancy and canopy cover of plant species in community 1.3.

This mid flooding community phase is typified by open scrubland that consists of a mix of shrubs and large open areas of bluejoint grass (*Calamagrostis canadensis*) and pioneer, disturbance-loving forbs. Common medium and tall shrubs include alders (Alnus spp.) and tealeaf willow (*Salix pulchra*). Regenerating and hardy trees that survived previous periods of flooding may be present and can include any or all of the species in the reference community phase. Open areas consist dominantly of bluejoint grass, but commonly include American red raspberry (*Rubus idaeus*), fireweed (*Chamerion angustifolium*), kneeling angelica (*Angelica genuflexa*), and horsetails (Equisetum spp.). The ground cover may include myriad mosses (about 50 percent average cover), herbaceous litter (about 65 percent), and woody litter (about 4 percent). As much as 1 percent is bare soil.

Community 1.4
Forb/graminoid meadow

This early flooding community phase typically is characterized by pioneer, disturbance-loving forbs and graminoids. These fast-growing plants typically spread by water- or wind-borne seeds, which allows for rapid colonization after a disturbance. Graminoids may include bluejoint grass (*Calamagrostis canadensis*) and various sedges (Carex spp.). Many species of forbs may be present, including fireweed (*Chamerion angustifolium*), horsetails (Equisetum spp.), and goldenrods (Solidago spp.). Hardy individual shrubs and trees that survived periods of flooding may be present. Note: This early flooding community phase was not observed in the field. This description is based on published literature and similar early post-flooding community phases on flood plains in southwestern Alaska.

Pathway 1.1a
Community 1.1 to 1.4

Major flooding can inundate the flood plains and cause erosion, deposition of sediment, and scouring of vegetation. Rare post-flood periods of ponding may also affect the composition of the plant community and result in transitions. Forbs and graminoids may colonize, and some water-tolerant trees and shrubs may survive. The frequency of flooding is rare or occasional. The white spruce (*Picea glauca*) trees are 55 to 200 years old or more (mean age of

105 years), which suggests that the typical major flood regime is once per century (100 years).

Pathway 1.2a
Community 1.2 to 1.1

Paper birch-Kenai birch-balsam poplar/alder-willow/bluejoint grass/horsetail forest

Mixed birch-white spruce/bluejoint grass/horsetails-woodfern/alder-spirea forest

Natural succession: Normal time and growth without disruptive flooding. Over time white spruce trees will increase in size and abundance and outcompete willow and alder for light and space; thus, the population of these species will decline. The period needed for this transition currently is unknown, but it likely is determined partially by the spread and growth rate of white spruce.

Pathway 1.2b
Community 1.2 to 1.4

Flooding. Although the flooding regime of this ecological site is very rare to occasional, a flood occurring within about 45 to 75 years of the last major flood likely will have effects similar to those described for transition pathway 1.1a.

Pathway 1.3a
Community 1.3 to 1.2

Arctic raspberry-Sitka alder-willow/bluejoint grass/horsetail-fireweed open scrubland

Paper birch-Kenai birch-balsam poplar/alder-willow/bluejoint grass/horsetail forest

Natural succession: Normal time and growth without disruptive flooding. Over time without further flooding, the abundance and diversity of existing, colonizing shrubs and trees that are competitive will increase. The diversity of graminoids and forbs may increase also as new ecological niches expand. The period needed for this transition is unknown, but it likely depends at least partially on the colonization and growth rate of shrubs and trees.

Pathway 1.3b
Community 1.3 to 1.4

Flooding. Although the frequency of flooding is very rare to occasional, flooding of plant community 1.3 likely will have effects similar to those described for pathway 1.2a. The probability of more than one flood occurring in a short period is relatively low.

Pathway 1.4a
Community 1.4 to 1.3

Natural succession: Normal time and growth without disruptive flooding. Over time shrubs likely will colonize and spread. The populations of existing forbs competing for space and sunlight may decrease, but the overall richness of the forbs is expected to increase as niches increase. Graminoids, particularly bluejoint grass, will continue to thrive.

State 2

Beaver-affected Areas

This alternate state is a result of ponding from beaver activity. Beavers (Castor canadensis) directly kill trees and large shrubs to use for food and dam construction and indirectly kill these species and others by raising the water table (USDA–FS, 2013). Ponding generally creates a vegetative community that is different from those normally on these flood plains. This plant community commonly includes resilient individual extant species present in the reference community phase and pioneer hydrophilic species. Permanent ponding associated with areas upstream from beaver dams can negate the influence of flooding on the soils and vegetation. The vegetative community is likely to remain relatively stable until the dam is removed. When the dam is removed by natural events, beaver abandonment, or human intervention, it is thought that the plant community will revert to the reference state. Further research is needed to quantify the outcome of dam removal in situ . Moderate or severe browsing of willow by moose has been observed on this alternate state community. The browsing may prevent willows from becoming dominant and maintain the community as open woodland rather than transitioning to closed scrubland.

Community 2.1
Paper birch/bluejoint grass/tealeaf willow/horsetails-purple marshlocks woodland

Figure 13. Typical area of community 2.1.

Community Phase Canopy Cover

(Vegetation data in the table are provided as constancy (percent) and average canopy cover (percent) of the most dominant and ecologically relevant species for this community phase.)

Plant group	Common name	Scientific name	USDA plant code	Constancy (percent)	Average canopy cover (percent)
T	Alaska paper birch	*Betula neoalaskana*	BENE4	200*	15^
S	Tealeaf willow	*Salix pulchra*	SAPU15	100	25
G	Bluejoint grass	*Calamagrostis canadensis*	CACA4	100	85
F	Purple marshlocks	*Comarum palustre*	COPA28	100	10
F	Arctic raspberry	*Rubus arcticus*	RUAR	100	8
F	Horsetails	*Equisetum spp.*	EQUIS	100, 50, 50#	30, 40, 6
F	Fireweed	*Chamerion angustifolium*	CHAN9	100	8

* Trees may be present in multiple strata within one plot; therefore, it is possible for species of this plant group to have a constancy value of more than 100 percent.

^ Tall, medium, and stunted individuals are counted as canopy trees. Regenerative individuals are not included.

Horsetails (*Equisetum spp.)* are represented by three species—*E. arvense, E. pretense,* and *E. sylvaticum*, respectively.

Figure 14. Constancy and canopy cover of plant species in community 2.1.

This community phase is associated with areas surrounding beaver ponds. It is characterized by open woodland that has disturbance-loving, hydrophilic species in the understory and in non-treed areas. The woodland generally consists dominantly of Alaska paper birch (*Betula neoalaskana*) in the medium and regenerative strata. The understory and open areas commonly support species such as bluejoint grass (*Calamagrostis canadensis*), purple marshlocks (*Comarum palustre*), tealeaf willow (*Salix pulchra*), and arctic raspberry (*Rubus arcticus*). Less dominant understory species include various willows (Salix spp.), horsetails (Equisetum spp.), spreading woodfern (*Dryopteris expansa*), and fireweed (*Chamerion angustifolium*). The ground cover typically consists of clusters of moss (about 25 percent average cover), herbaceous litter (about 95 percent), woody litter (about 2 percent), and rock fragments (about 1 percent). About 5 percent is bare soil. Note: The vegetation and soils in two areas of this plant community phase were sampled. Due to the limited data available, personal field observations were used to aid in describing the community.

Transition T1A
State 1 to 2

This transition is caused by the damming of a water source by beavers. Areas surrounding beaver ponds may support plant assemblages distinct from those typically on these high flood plains. The vegetative community generally is comprised of species that are water tolerant and can reproduce in wet soils. Areas surrounding beaver ponds may be susceptible to flooding or ponding after rainfall and snowmelt. This prevents the vegetative community from supporting non-hydrophilic species, which may keep the composition of the plant community relatively stable. The time required for this transition depends on the presence and activity of beavers.

Restoration pathway R2A
State 2 to 1

This restorative pathway to the reference state occurs in areas where a beaver dam is removed. This can be a result of flooding, inactivity by beavers, or anthropogenic activity. Once a dam is removed, the plant community is expected to transition back to the reference state. This depends on factors such as the existing seed bank, propagule recruitment, and return of the natural flooding regime. Further research and in situ documentation is needed to fully describe this pathway.

Additional community tables

Table 7. Community 1.1 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height (M)	Canopy Cover (%)	Diameter (Cm)	Basal Area (Square M/Hectare)
Tree							
paper birch	BEPA	*Betula papyrifera*	–	–	30–35	–	–
Kenai birch	BEPAK	*Betula papyrifera var. kenaica*	–	–	30–35	–	–
white spruce	PIGL	*Picea glauca*	–	–	20–25	–	–

Table 8. Community 1.1 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (M)	Canopy Cover (%)
Shrub/Subshrub					
squashberry	VIED	*Viburnum edule*	–	–	5–10
arctic raspberry	RUAR	*Rubus arcticus*	–	–	5–10

Inventory data references

NASIS modal data points
Community 1.1
08AO07204
08SS10101
08SS11402
09AO10004

Community 1.2
09SS10401
08SS12507
08LL07306
08LL09806

Community 1.3
09SS11305

09SS10504

Community 1.4.
No data points

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Contributors

Phil Barber
Stephanie Schmit
Sue Tester
Kendra Moseley
Michael Margo
Jamin Johanson
Steff Shoemaker

Approval

Jamin Johanson, 2/07/2024

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	05/04/2024
Approved by	Jamin Johanson
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:

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:**

17. **Perennial plant reproductive capability:**