USDA Natural Resources Conservation Service

Ecological site F236XY176AK
Boreal Woodland Loamy Flood Plains

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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.

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 ecological site is on flood plain talfs of smaller tributary creeks. Site elevation is between 30 and 980 feet above sea level. Slopes are nearly level (0 – 3 percent). Soil hydrology, flooding, and a fire regime shape the vegetation on this site. A shallow water table and aquic soil conditions below 17 inches limit the number of white spruce on this site and create a woodland canopy rather than a forest. Wet soil is also reflected in the facultative to facultative wet wetland species found in the understory.

Local site factors including soil and site hydrology and flooding and fire disturbances support five communities in the reference stateThe reference state supports five communities. The reference plant community is characterized as a coniferous woodland (Viereck et al., 1992). It is composed of a white spruce canopy with an open understory of facultative to obligate wetland shrub, forb, and graminoid species. The relatively small size of this site along smaller tributaries make it susceptible to surrounding fires. Fires are more likely to occur in drier areas of this site where standing and dead trees and shrubs provide the most fuel. Post-fire vegetation is comprised of fast growing herbaceous species and extant shrubs.

Associated sites

R236XY144AK	**Subarctic Scrub Peat Terraces** R236XY144AK describes shrubland terraces in valleys. These terraces are supported on wet soils found alongside and at slightly higher elevations within a valley than the forested flood plains described by F236XY176AK.
F236XY139AK	**Boreal Woodland Loamy Rises** F236XY139AK describes a boreal woodland on plains. These landforms slope down and abut the flood plains described by this site.
R236XY173AK	**Subarctic Riparian Complex Loamy Flood Plains** R236XY173AK describes a rangeland on narrow valley flood plains. Occasional, long flooding events prevent a forest from developing on this site.

Similar sites

F236XY139AK	**Boreal Woodland Loamy Rises** F236XY139AK describes a boreal woodland on plains. The forested reference plant communities on these sites are similar. However, site and soil differences result in different understory communities and different disturbance regimes.

Table 1. Dominant plant species

Tree	(1) *Picea glauca*
Shrub	(1) *Salix pulchra* (2) *Rubus arcticus*
Herbaceous	(1) *Calamagrostis canadensis* (2) *Equisetum arvense*

Physiographic features

This site is on linear to convex flood plain talfs of tributaries. Elevation ranges from 30 to 980 feet above sea level. Slopes are nearly level (0 – 3 percent). This site is found at all aspects. Flooding is an occasional and brief event. A water table is present between 10 and 20 inches throughout the year.

Table 2. Representative physiographic features

Geomorphic position, flats	(1) Talf
Slope shape across	(1) Linear
Slope shape up-down	(1) Linear (2) Convex
Landforms	(1) Valley > Flood plain
Runoff class	Negligible to low
Flooding duration	Brief (2 to 7 days)
Flooding frequency	Occasional
Ponding frequency	None
Elevation	30–980 ft
Slope	0–3%
Water table depth	10–20 in
Aspect	W, NW, N, NE, E, SE, S, SW

Table 3. Representative physiographic features (actual ranges)

Runoff class	Negligible to low

Flooding duration	Brief (2 to 7 days)
Flooding frequency	Occasional
Ponding frequency	None
Elevation	20–980 ft
Slope	0–3%
Water table depth	4–71 in

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)	21-34 in
Frost-free period (actual range)	75-100 days
Freeze-free period (actual range)	65-90 days
Precipitation total (actual range)	15-41 in
Frost-free period (average)	90 days
Freeze-free period (average)	75 days
Precipitation total (average)	29 in

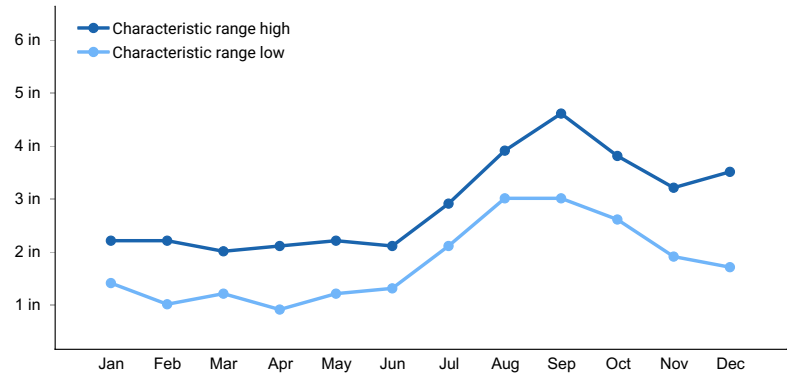


Figure 1. Monthly precipitation range

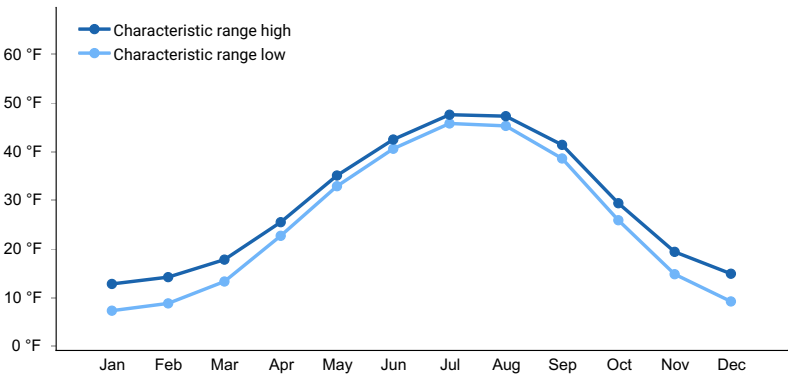


Figure 2. Monthly minimum temperature range

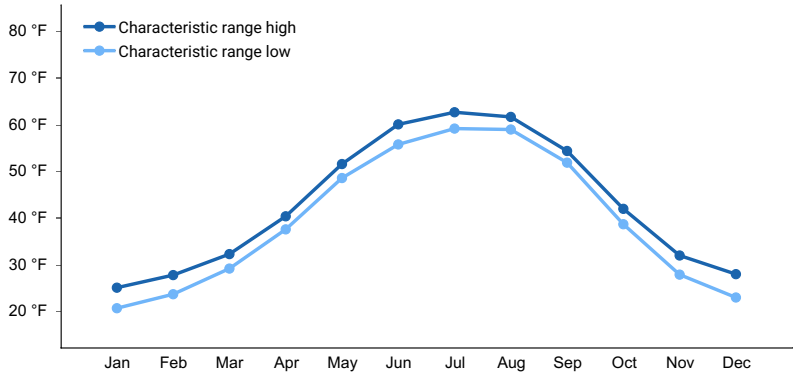


Figure 3. Monthly maximum temperature range

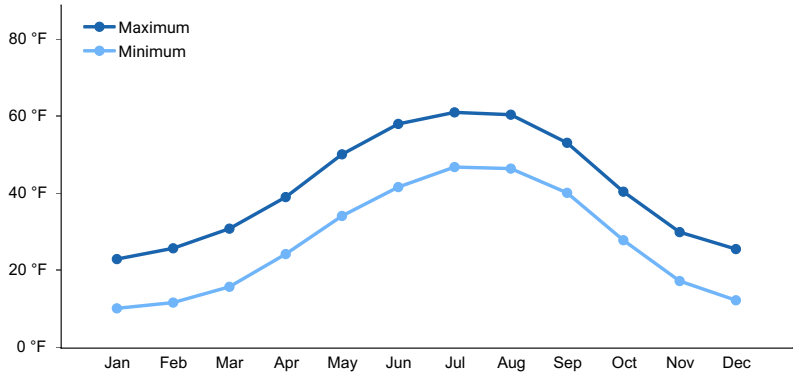


Figure 4. Monthly average minimum and maximum temperature

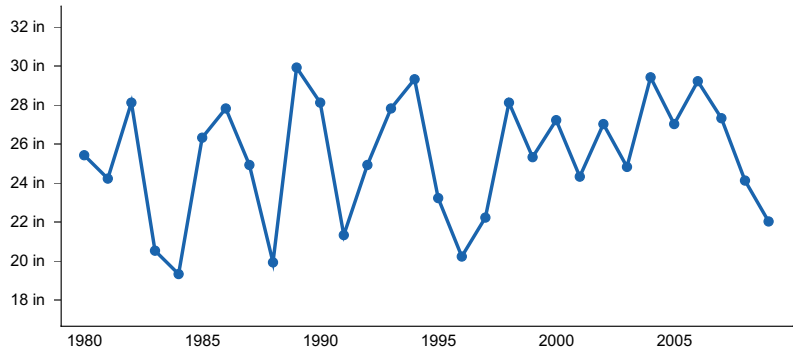


Figure 5. Annual precipitation pattern

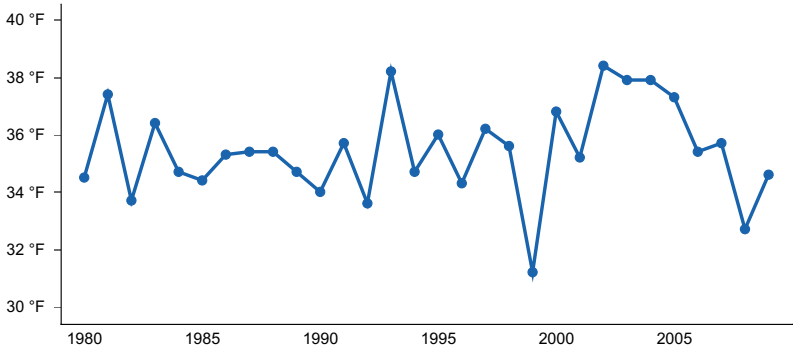


Figure 6. Annual average temperature pattern

Influencing water features

This site is on flood plains. It experiences occasional, brief flooding during periods of large snow melt and high precipitation. Vegetation is a mix of facultative to facultative wet wetland species.

Soil features

Soils are young and weakly developed Inceptisols (Soil Survey Staff, 2013). Soils are very deep and somewhat poorly drained. They support a cryic temperature regime and an aquic moisture regime. Parent material is alluvium.

Soil hydrology shapes vegetation on this site. A shallow water table is present throughout the year. Aquic soil conditions begin at 17 inches and continue through the soil profile. Wet soil conditions likely limit the number of white spruce on this site and create a woodland canopy rather than a forest. Wet soil is also reflected in the facultative to facultative wet wetland species found in the understory.

Correlated soil components in MLRA 236: Keefer; Fluvaquentic Cryaquepts, forest; D36-Boreal woodland loamy flood plains

Table 5. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Silt loam
Drainage class	Somewhat poorly drained
Permeability class	Moderate
Soil depth	60 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-10in)	1.5–2.6 in
Soil reaction (1:1 water) (0-10in)	4.2–5.5
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Table 6. Representative soil features (actual values)

Drainage class	Somewhat poorly drained to moderately well drained
Permeability class	Moderate
Soil depth	60 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-10in)	1.5–3.1 in
Soil reaction (1:1 water) (0-10in)	4.2–6
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

This site is on flood plain talfs of smaller streams. This stie is common along upstream tributaries of the larger Nushagak and Mulchatna Rivers. Local site factors including soil and site hydrology and flooding and fire disturbances support five communities in the reference state. The reference plant community is a white spruce

woodland with an understory of predominantly facultative to obligate wetland species.

Flooding is a major disturbance on this site. Spatial and temporal patterns in soil and site hydrology shape three communities. Areas with increased flooding energy and higher throughflow are most likely to support the early flood phase (community 1.3). These areas are too wet to support white spruce. An intermediate flood phase(community 1.2) is also present.

Hydrological changes caused by a change in throughflow or in the movement of a channel can shift one community to the other. A raised water table, caused by increased precipitation or more run off due to a watershed fire, can kill trees and shrubs and shift the community to a herbaceous meadow. Likewise, a decreased water table allows less hydrophytic and slower growing species to colonize.

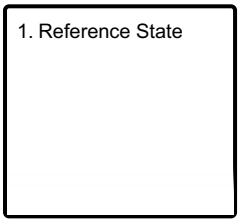
Fire occurs on this site. Fire is hypothesized to be an infrequent occurrence on active flood plains. However, the small size of this site along smaller tributaries make them susceptible to surrounding fires. Fires are more likely to occur in drier areas of this site where standing and dead trees and shrubs provide the most fuel.

Willows are moderately browsed by moose, particularly in the reference plant community. This does not appear to affect the ecological processes of the site.

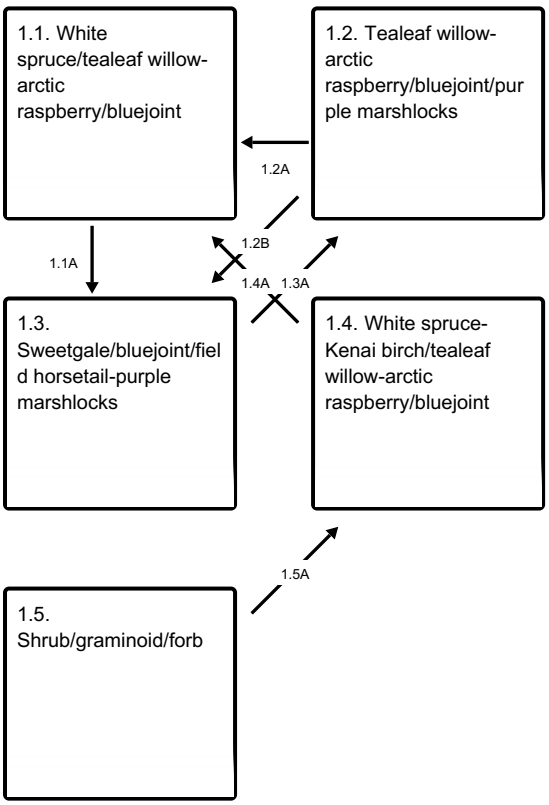
The information in this Ecological Dynamics section, including the state-and-transition model (STM), was developed based on current field data, professional experience, and a review of the scientific literature. As a result, all possible scenarios or plant species may not be included. Key indicator plant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

State and transition model

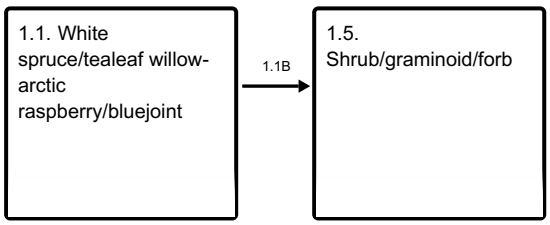
Ecosystem states



State 1 submodel, plant communities



Communities 1 and 5 (additional pathways)



1.1A - Increased hydrologic pressures

1.1B - Fire

1.2A - Decreased hydrologic pressure

1.2B - Increased hydrologic pressure

1.3A - Decreased hydrologic pressure

1.4A - Fire recovery.

1.5A - Fire recovery.

State 1
Reference State

The reference state supports five community phases, which are distinguished by the developed structure and dominance of the vegetation and by their ecological function and stability. The reference community phase is woodland. The presence of each community is dictated temporally by flooding or fire. This report provides baseline inventory data on the vegetation. Future data collection is needed to provide further information about existing plant communities and the disturbance regimes that result in transitions from one community to another. Common and scientific names are from the USDA PLANTS database. Community phases are characterized by the Alaska Vegetation Classification System (Viereck et al., 1992).

Community 1.1
White spruce/tealeaf willow-arctic raspberry/bluejoint

Figure 7. Typical area of community 1.1.

Community Phase 1.1 Canopy Cover Table

Vegetation data is aggregated across modal sample plots for this community phase and is provided as frequency (percent) and mean canopy cover (percent) of the most dominant and ecologically relevant species. Canopy cover is represented as a mean with the range in parentheses.

Plant group	Common name	Scientific name	USDA plant code	Frequency (percent)	Mean canopy cover (percent)
T	White spruce	*Picea glauca*	PIGL	200*	20*
S	Arctic raspberry	*Rubus arcticus*	RUAR	100	10
S	Tealeaf willow	*Salix pulchra*	SAPU15	67	45
S	Barclay's willow	*Salix barclayi*	SABA3	67	10
G	Bluejoint	*Calamagrostis canadensis*	CACA4	100	50
F	Field horsetail	*Equisetum arvense*	EQAR	100	15
F	Canadian burnet	*Sanguisorba canadensis*	SACA14	100	3
F	Fireweed	*Chamerion angustifolium*	CHAN9	67	4

* 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.

This dataset includes data from 3 sample plots. The sample plots are distributed across the survey area and are independent of one another. Due to the limited data available for this community phase, personal field observations were also used to aid in describing the vegetative community.

Plant functional group classifications—T = trees, S = shrubs, G = graminoids, F = forbs, B = bryophytes, L = lichens

Canopy cover data is rounded, except trace (0.1 percent) cover. Data ranging from 1 to 9 percent cover is rounded to the nearest integer. Data ranging from 10 to 100 percent cover is rounded to the nearest factor of 5.

Figure 8. Frequency and canopy cover of plants in community 1.1.

The reference plant community is needleleaf woodland (Viereck et al., 1992) that has a mix of shrubs, graminoids, and forbs throughout. This community consists of medium (15 to 40 feet tall) and tall (more than 40 feet tall) white spruce (*Picea glauca*) and an understory of tealeaf willow (*Salix pulchra*), Barclay's willow (*Salix barclayi*), arctic raspberry (*Rubus arcticus*), bluejoint (*Calamagrostis canadensis*), field horsetail (*Equisetum arvense*), and Canadian burnet (*Sanguisorba canadensis*). Other species may include lingonberry (*Vaccinium vitis-idaea*), sweetgale (*Myrica gale*), sedges (Carex spp.), fireweed (*Chamerion angustifolium*), and arctic starflower (*Trientalis europaea*). Some paper birch (*Betula papyrifera*) may be present. Shrub species, ranging from dwarf (less than 8 inches tall) to tall (more than 10 feet tall), commonly are present. Mosses are common in the ground cover, and a low density of lichens typically are present. The ground cover also may include herbaceous litter, woody litter, and water. Some areas are bare soil.

Dominant plant species

- white spruce (*Picea glauca*), tree
- arctic raspberry (*Rubus arcticus*), shrub
- tealeaf willow (*Salix pulchra*), shrub
- Barclay's willow (*Salix barclayi*), shrub
- bluejoint (*Calamagrostis canadensis*), grass
- field horsetail (*Equisetum arvense*), other herbaceous
- Canadian burnet (*Sanguisorba canadensis*), other herbaceous
- fireweed (*Chamerion angustifolium*), other herbaceous

Community 1.2
Tealeaf willow-arctic raspberry/bluejoint/purple marshlocks

Figure 9. Typical area of community 1.2.

Community Phase 1.2 Canopy Cover Table

Vegetation data is aggregated across modal sample plots for this community phase and is provided as frequency (percent) and mean canopy cover (percent) of the most dominant and ecologically relevant species. Canopy cover is represented as a mean with the range in parentheses.

Plant group	Common name	Scientific name	USDA plant code	Frequency (percent)	Mean canopy cover (percent)
S	Tealeaf willow	*Salix pulchra*	SAPU15	100	30
S	Cloudberry	*Rubus chamaemorus*	RUCH	100	6
S	Thinleaf alder	*Alnus incana* ssp. *tenuifolia*	ALINT	50	35
S	Bog blueberry	*Vaccinium uliginosum*	VAUL	50	30
G	Bluejoint	*Calamagrostis canadensis*	CACA4	100	65
F	Purple marshlocks	*Comarum palustre*	COPA28	100	10
M	Sphagnum moss	*Sphagnum spp.*	SPHAG2#	100	25

Sphagnum mosses (*Sphagnum spp.*) are combined and distinguished at the genus level.

This dataset includes data from 2 sample plots. The sample plots are distributed across the survey area and are independent of one another. Due to the limited data available for this community phase, personal field observations were also used to aid in describing the vegetative community.

Plant functional group classifications—T = trees, S = shrubs, G = graminoids, F = forbs, B = bryophytes, L = lichens

Canopy cover data is rounded, except trace (0.1 percent) cover. Data ranging from 1 to 9 percent cover is rounded to the nearest integer. Data ranging from 10 to 100 percent cover is rounded to the nearest factor of 5.

Figure 10. Frequency and canopy cover of plants in community 1.2.

The late flooding community phase is open tall scrubland that has an understory of hydrophilic forbs and dense graminoids. This community consists of medium and tall tealeaf willow and thinleaf alder (*Alnus incana* ssp. tenuifolia) and an understory of cloudberry (*Rubus chamaemorus*), dense bluejoint, purple marshlocks (*Comarum palustre*), and horsetails. Other species may include bog blueberry (*Vaccinium uliginosum*), spirea (*Spiraea stevenii*), dwarf birch (*Betula nana*), violets (Viola spp.), and tall Jacob's ladder (*Polemonium acutiflorum*). Individual white spruce trees may be present. Mosses, typically including sphagnum mosses (Sphagnum spp.), are in the ground cover. Lichens typically are not in this community. The ground cover may include herbaceous litter, woody litter, and water.

Dominant plant species

- tealeaf willow (*Salix pulchra*), shrub
- cloudberry (*Rubus chamaemorus*), shrub
- thinleaf alder (*Alnus incana ssp. tenuifolia*), shrub

- bog blueberry (*Vaccinium uliginosum*), shrub
- bluejoint (*Calamagrostis canadensis*), grass
- purple marshlocks (*Comarum palustre*), other herbaceous
- sphagnum (*Sphagnum*), other herbaceous

Community 1.3
Sweetgale/bluejoint/field horsetail-purple marshlocks

Figure 11. Typical area of community 1.3.

Community Phase 1.3 Canopy Cover Table

Vegetation data is aggregated across modal sample plots for this community phase and is provided as frequency (percent) and mean canopy cover (percent) of the most dominant and ecologically relevant species. Canopy cover is represented as a mean with the range in parentheses.

Plant group	Common name	Scientific name	USDA plant code	Frequency (percent)	Mean canopy cover (percent)
S	Sweetgale	*Myrica gale*	MYGA	100	10
S	Tealeaf willow	*Salix pulchra*	SAPU15	100	10
G	Bluejoint	*Calamagrostis canadensis*	CACA4	100	80
F	Field horsetail	*Equisetum arvense*	EQAR	100	10
F	Purple marshlocks	*Comarum palustre*	COPA28	100	5

This dataset includes data from 15 sample plots. The sample plots are distributed across the survey area and are independent of one another.

Plant functional group classifications—T = trees, S = shrubs, G = graminoids, F = forbs, B = bryophytes, L = lichens

Canopy cover data is rounded, except trace (0.1 percent) cover. Data ranging from 1 to 9 percent cover is rounded to the nearest integer. Data ranging from 10 to 100 percent cover is rounded to the nearest factor of 5.

Figure 12. Frequency and canopy cover of plants in community 1.3.

The early flooding community is a mesic graminoid herbaceous meadow (Viereck et al., 1992) that has hydrophilic shrubs and forbs throughout. This community consists of dense bluejoint and hydrophilic shrubs and forbs such as sweetgale, tealeaf willow, purple marshlocks, and field horsetail. Other species may include livid sedge (*Carex livida*), silvery sedge (*Carex canescens*), woolly geranium (*Geranium erianthum*), and Canadian burnet. The ground cover typically includes moss, herbaceous litter, and water. Some areas are bare soil.

Dominant plant species

- sweetgale (*Myrica gale*), shrub
- tealeaf willow (*Salix pulchra*), shrub
- bluejoint (*Calamagrostis canadensis*), grass
- field horsetail (*Equisetum arvense*), other herbaceous
- purple marshlocks (*Comarum palustre*), other herbaceous

Community 1.4
White spruce-Kenai birch/tealeaf willow-arctic raspberry/bluejoint

Figure 13. Typical area of community 1.4.

Community Phase 1.4 Canopy Cover Table

Vegetation data is aggregated across modal sample plots for this community phase and is provided as frequency (percent) and mean canopy cover (percent) of the most dominant and ecologically relevant species. Canopy cover is represented as a mean with the range in parentheses.

Plant group	Common name	Scientific name	USDA plant code	Frequency (percent)	Mean canopy cover (percent)
T	White spruce	*Picea glauca*	PIGL	200*	15^
T	Kenai birch	*Betula papyrifera* var. *kenaica*	BEPAK	67	10^
S	Tealeaf willow	*Salix pulchra*	SAPU15	100	20
S	Arctic raspberry	*Rubus arcticus*	RUAR	100	7
S	Lingonberry	*Vaccinium vitis-idaea*	VAVI	67	25
G	Bluejoint	*Calamagrostis canadensis*	CACA4	100	10
F	Field horsetail	*Equisetum arvense*	EQAR	100	9
F	Fireweed	*Chamerion angustifolium*	CHAN9	100	2

* 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.

This dataset includes data from 3 sample plots. The sample plots are distributed across the survey area and are independent of one another. Due to the limited data available for this community phase, personal field observations were also used to aid in describing the vegetative community.

Plant functional group classifications—T = trees, S = shrubs, G = graminoids, F = forbs, B = bryophytes, L = lichens

Canopy cover data is rounded, except trace (0.1 percent) cover. Data ranging from 1 to 9 percent cover is rounded to the nearest integer. Data ranging from 10 to 100 percent cover is rounded to the nearest factor of 5.

Figure 14. Frequency and canopy cover of plants in community 1.4.

This community phase is mixed woodland that has various shrubs, graminoids, and forbs in the understory. This community consists of an open canopy of white spruce and Kenai birch (*Betula papyrifera* var. kenaica) and an understory of tealeaf willow, arctic raspberry, bluejoint, and field horsetail. Other species in the understory may

include lingonberry (*Vaccinium vitis-idaea*), spirea, bluegrasses (Poa spp.), woodland horsetail (*Equisetum sylvaticum*), fireweed, and Canadian burnet. Other tree species may include paper birch (*Betula papyrifera*) and Alaska birch (*Betula neoalaskana*). Various mosses, including sphagnum moss, Schreber's big red stem moss (*Pleurozium schreberi*), and splendid feathermoss (*Hylocomium splendens*) typically make up a large mat. A small amount of lichens may be present. Other ground cover includes herbaceous litter and woody litter.

Dominant plant species

- white spruce (*Picea glauca*), tree
- Kenai birch (*Betula papyrifera var. kenaica*), tree
- tealeaf willow (*Salix pulchra*), shrub
- arctic raspberry (*Rubus arcticus*), shrub
- lingonberry (*Vaccinium vitis-idaea*), shrub
- bluejoint (*Calamagrostis canadensis*), grass
- field horsetail (*Equisetum arvense*), other herbaceous
- fireweed (*Chamerion angustifolium*), other herbaceous

Community 1.5
Shrub/graminoid/forb

This post-fire community phase was not observed in the field. Based on post-fire communities in other treed ecological sites, it is hypothesized that the post-fire community will support of a variety of fast-growing forbs and graminoids and extant shrubs that remain.

Pathway 1.1A
Community 1.1 to 1.3

White spruce/tealeaf willow-arctic raspberry/bluejoint

Sweetgale/bluejoint/field horsetail-purple marshlocks

A raised water table due to increased throughflow can shift the vegetation towards a herbaceous meadow. A raised water table can be the result of increased throughflow or overflow, which can be caused by increased precipitation, increased snow melt, or increased run-off due to a fire in the watershed.

Pathway 1.1B
Community 1.1 to 1.5

Fire. Fire is hypothesized to be rare. Dead white spruce trees provide fuel for fires caused by natural events, such as lightning. In areas where dead spruce trees and shrubs are abundant, the fires are hypothesized to be low-intensity due to nearby water sources and periods of flooding. Fast-growing pioneer species that have propagules spread by wind typically colonize the post-fire areas.

Pathway 1.2A
Community 1.2 to 1.1

Tealeaf willow-arctic raspberry/bluejoint/purple marshlocks

White spruce/tealeaf willow-arctic raspberry/bluejoint

A lowered water table allows less hydrophytic and slower growing species to colonize. The period needed currently is unknown. It likely depends on myriad factors, including the reproduction and colonization rates of white spruce

and changes in throughflow and overflow patterns.

Pathway 1.2B
Community 1.2 to 1.3

Tealeaf willow-arctic raspberry/bluejoint/purple marshlocks

Sweetgale/bluejoint/field horsetail-purple marshlocks

A raised water table due to increased throughflow can shift the vegetation towards a herbaceous meadow. A raised water table can be the result of increased throughflow or overflow, which can be caused by increased precipitation, increased snow melt, or increased run-off due to a fire in the watershed.

Pathway 1.3A
Community 1.3 to 1.2

Sweetgale/bluejoint/field horsetail-purple marshlocks

Tealeaf willow-arctic raspberry/bluejoint/purple marshlocks

Slower growing vegetation, such as shrubs, outcompete extant forbs and graminoids for light and space and increase in richness and abundance. White spruce colonizes in drier areas. The period needed for this transition currently is unknown; however, the bluejoint grass-dominant community (phase 1.3) tends to remain for extended periods due to post-flood ponding.

Pathway 1.4A
Community 1.4 to 1.1

White spruce-Kenai birch/tealeaf willow-arctic raspberry/bluejoint

White spruce/tealeaf willow-arctic raspberry/bluejoint

Natural succession: Normal time and growth without disruptive fire and with return of natural flooding regime. White spruce eventually will shade out deciduous trees, which will alter the understory. The period needed for this transition currently is unknown. A return of the natural flooding regime in burned areas will aid in the transition to the reference plant community.

Pathway 1.5A
Community 1.5 to 1.4

Natural succession. Over time, slower growing vegetation, such as shrubs, likely will outcompete extant forbs and graminoids for light and space and increase in richness and abundance. Deciduous and conifer trees will colonize. Community 1.5 was not recorded in the field; therefore, the period needed for this transition currently is unknown.

Additional community tables

Table 7. Community 1.1 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height (Ft)	Canopy Cover (%)	Diameter (In)	Basal Area (Square Ft/Acre)
Tree							
white spruce	PIGL	*Picea glauca*	Native	–	20	–	–

Table 8. Community 1.1 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (Ft)	Canopy Cover (%)
Grass/grass-like (Graminoids)					
bluejoint	CACA4	*Calamagrostis canadensis*	Native	–	50
Forb/Herb					
field horsetail	EQAR	*Equisetum arvense*	Native	–	15
fireweed	CHAN9	*Chamerion angustifolium*	Native	–	4
Canadian burnet	SACA14	*Sanguisorba canadensis*	Native	–	3
Shrub/Subshrub					
tealeaf willow	SAPU15	*Salix pulchra*	Native	–	45
Barclay's willow	SABA3	*Salix barclayi*	Native	–	10
arctic raspberry	RUAR	*Rubus arcticus*	Native	0.5–	10

Inventory data references

Modal points for Community 1.1
08SS07605
09AO11007

Modal points for Community 1.2
08AO06501
10SS08105

Modal points for Community 1.3
09AO11305
09SS12505

Modal points for Community 1.4
07SM01006
10SS11805

Modal points for Community 1.5
None

References

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Approval

Kirt Walstad, 2/13/2024

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	04/29/2024
Approved by	Kirt Walstad
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):**

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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:**
