USDA Natural Resources Conservation Service

Ecological site XA232X01Y202
Boreal Forest Loamy Flood Plain Middle

Last updated: 5/11/2020
Accessed: 05/18/2024

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.

MLRA notes

Major Land Resource Area (MLRA): 232X–Yukon Flats Lowlands

The Yukon Flats Lowlands MLRA is an expansive basin characterized by numerous levels of flood plains and terraces that are separated by minimal breaks in elevation. This MLRA is in Interior Alaska and is adjacent to the middle reaches of the Yukon River. Numerous tributaries of the Yukon River are within the Yukon Flats Lowlands MLRA. The largest are Beaver Creek, Birch Creek, Black River, Chandalar River, Christian River, Dall River, Hadweenzic River, Hodzana River, Porcupine River, and Sheenjek River. The MLRA has two distinct regions—lowlands and marginal uplands. The lowlands have minimal local relief and are approximately 9,000 square miles in size (Williams 1962). Landforms associated with the lowlands are flood plains and stream terraces. The marginal uplands consist of rolling and dissected plains that are a transitional area between the lowlands and adjacent mountain systems. The marginal uplands are approximately 4,700 square miles in size (Williams 1962).

This MLRA is bounded by the Yukon-Tanana Plateau to the south, Hodzana Highlands to the west, Porcupine Plateau to the east, and southern foothills of the Brooks Range to the north (Williams 1962). These surrounding hills and mountains partially isolate the Yukon Flats Lowlands MLRA from weather systems affecting other MLRAs of Interior Alaska. As a result, temperatures are generally warmer in summer and colder in winter than is characteristic in other areas at comparable latitude. There is a moisture and temperature gradient in which the lowlands region tends to be drier and colder and the surrounding marginal uplands region tends to be moister and warmer (PRISM Climate Group 2006).

The Yukon Flats Lowlands MLRA is mostly undeveloped lands that are sparsely populated and not accessible by a road system. A number of villages, including Beaver, Birch Creek, Chalkyitsik, Circle, Fort Yukon, Stevens Village, and Venetie, are adjacent to the Yukon River or one of its major tributaries. The largest village is Fort Yukon, which according to the 2010 U.S. Census has 583 residents that are dominantly Gwich'in Alaska Natives.

LRU notes

Alaska has no officially recognized LRU. However, there appear to be two distinct LRU in the Yukon Flats Lowlands MLRA. These LRU are thought to have differing climatic regimes, landforms, and soil types (STATSGO and Jorgensen and Meidinger 2015). The two LRU were previously discussed in the MLRA notes section above and are termed the lowlands LRU and the marginal uplands LRU.

This ecological site is associated with the lowlands LRU.

Classification relationships

Yukon Flats Lowlands MLRA.

Ecological site concept

This ecological site is associated with the middle flood plain of major tributaries in the Yukon Flats Lowlands MLRA. In this MLRA, the flood plains of major tributaries have been divided into having low, middle, and/or high positions. When compared to the low flood plain, the middle flood plain has less frequent and shorter duration flood events. When compared to the high flood plain, the middle flood plain has more frequent and longer duration flood events. Flooding occurs occasionally (5 to 50 times in 100 years) for long durations of time (between 7 and 30 days). Associated soils are considered moderately well drained. The reference state supports two plant communities related to flooding.

Reference plant community 1.1 is characterized as a closed deciduous forest (60-100 percent cover; Viereck et al. 1992) primarily composed of mature balsam poplar (Populus balsamifera). Seedlings of white spruce (*Picea glauca*) are commonly observed but generally have low canopy cover. Commonly observed understory species include prickly rose (Rosa acicularis), thinleaf alder (Alnus incana ssp. tenuifolia), redosier dogwood (Cornus sericea), feltleaf willow (*Salix alaxensis*), and field horsetail (Equisetum arvense). The soil surface is covered primarily by herbaceous litter and woody debris.

Associated sites

XA232X01Y204	**Boreal Forest Loamy Flood Plain High** This ecological site occurs on the high flood plain of major tributaries in the Yukon Flats Lowlands MLRA. Flooding occurs occasionally (5 to 50 times in 100 years) for brief durations of time (between 2 and 7 days). The reference plant community is characterized as an open needleleaf forest (25 to 60 percent cover) primarily composed of mature white spruce (Picea glauca).
XA232X01Y250	**Boreal Woodland Gravelly Terraces Dry** This ecological site is associated with somewhat excessively drained soils on the tread of gravelly stream terraces in Yukon Flats Lowlands MLRA. Gravelly horizons occur at very shallow depth (0 to 10 inches). The reference plant community is characterized as a needleleaf woodland (10 to 25 percent cover; Viereck et al. 1992) composed primarily of mature white spruce (Picea glauca).
XA232X01Y200	**Boreal Scrub Loamy Flood Plain Low** This ecological site is associated with the low flood plain of major tributaries in the Yukon Flats Lowlands MLRA. Flooding occurs frequently (greater than 50 times in 100 years) for long durations of time (between 7 and 30 days). The reference plant community is characterized as closed tall scrub (greater than 75 percent shrub cover; Viereck et al. 1992) primarily composed of a mixture of willow (Salix spp.) and alder (Alder spp.).
XA232X01Y205	**Boreal Grass Loamy Flood Plain Depressions** This ecological site is associated with depressions on flood plains in the Yukon Flats Lowlands MLRA. The reference state plant communities are associated with soils that both pond and flood. Ponding occurs frequently (greater than 50 times in 100 years) for long durations of time (between 7 and 30 days). Flooding occurs occasionally (5 to 50 times in 100 years) for brief durations of time (between 2 and 7 days). The reference plant community is characterized as mesic graminoid herbaceous (Viereck et al. 1992) and is primarily composed of bluejoint (Calamagrostis canadensis).
XA232X01Y218	**Boreal Woodland Loamy Frozen Terraces** This ecological site is associated with wet soils on the tread of stream terraces in Yukon Flats Lowlands MLRA. Soils generally have permafrost at moderate depth (20 to 40 inches) and pond occasionally for long durations of time. The reference plant community is characterized as a needleleaf woodland (10 to 25 percent cover; Viereck et al. 1992) composed of black spruce (Picea mariana) and white spruce (Picea glauca).
XA232X01Y206	**Boreal Scrub Loamy Frozen Flood Plain Depressions** This ecological site is associated with depressions on flood plains in the Yukon Flats Lowlands MLRA. The reference state plant communities are associated with soils that both pond and flood. Ponding occurs occasionally (5 to 50 times in 100 years) for brief durations of time (between 2 and 7 days). Flooding occurs occasionally for brief durations of time. The reference plant community is characterized as open tall scrub (Viereck et al. 1992) and is primarily composed of willow (Salix spp.).

Similar sites

XA232X01Y200	**Boreal Scrub Loamy Flood Plain Low** While seedlings of balsam poplar are commonly observed, stands of mature balsam poplar are not associated with this ecological site. Ecological site XA232X01Y200 is characterized by the dominance of shrubby vegetation.
XA232X01Y204	**Boreal Forest Loamy Flood Plain High** While seedlings and mature individuals of balsam poplar are commonly observed, stands of mature balsam poplar are not associated with this ecological site. Ecological site XA232X01Y204 is characterized by the dominance of mature stands of white spruce.

Table 1. Dominant plant species

Tree	(1) *Populus balsamifera*
Shrub	(1) *Rosa acicularis* (2) *Cornus sericea*
Herbaceous	(1) *Equisetum arvense*

Legacy ID

F232XY202AK

Physiographic features

This ecological site and its associated communities occur throughout the Yukon Flats Lowlands MLRA. Given the large spatial extent, the site is associated with two soil components. The differences in site characteristics among these soils are discussed in this section.

Soils associated with rivers that are currently or have previously been glacially fed have different characteristics than those associated with nonglacial rivers. For instance, glacial rivers that flow out of the southern foothills of the Brooks Range created large gravelly stream terraces north of the Yukon River (e.g. Sheenjek River). The soils on these terraces and adjacent flood plains tend to have a sandy and gravelly substrata (Hodzana soils). Nonglacial rivers that flow out of the Yukon-Tanana Plateau (e.g., Birch Creek) formed numerous terrace levels south of the Yukon River. The soils on these flood plain and terrace levels have a loamy substrata (Theodore soils).

Each soil type originally had a correspondingly unique ecological site. After more fieldwork and data analysis, it was determined that these two soil types appear to support plant communities that have similar kinds and amounts of vegetation in the reference state. As a result, the soil components were all correlated into one ecological site.

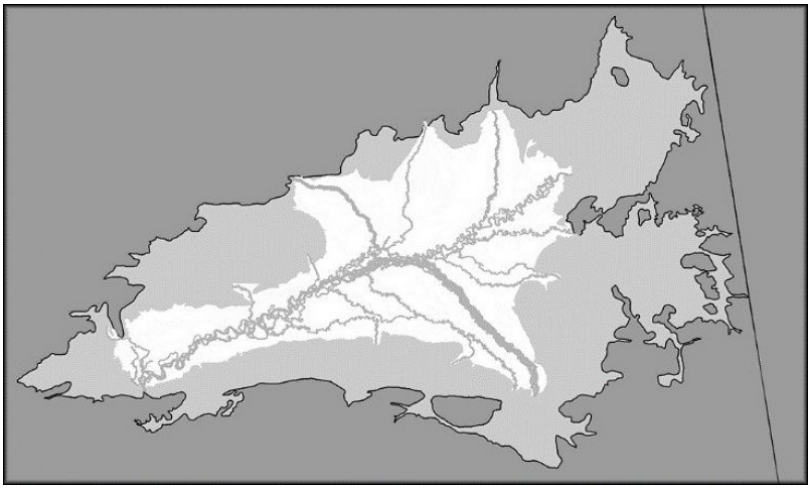


Figure 1. Lowlands (white) and marginal uplands (light gray) LRU of the Yukon Flats Lowlands MLRA.

Table 2. Representative physiographic features

Landforms	(1) Alluvial plain > Flood plain

Flooding duration	Long (7 to 30 days)
Flooding frequency	Occasional
Ponding frequency	None
Elevation	91–305 m
Slope	0–3%
Aspect	W, NW, N, NE, E, SE, S, SW

Climatic features

Short, warm summers and long, very cold winters characterize the subarctic continental climate of the area. The surrounding hills and mountains of this MLRA partially isolate it from weather systems affecting other interior lowlands. As a result, temperatures are generally warmer in summer and colder in winter than is characteristic in other areas of comparable latitude. The average annual temperature ranges from about 20 to 25 degrees F (-7 to -4 degrees C). The freeze-free period averages 70 to 120 days. The temperature usually remains above freezing from early June through late August. The average annual precipitation ranges from about 6 inches (150 millimeters) in the central basin to 15 inches (380 millimeters) along the boundary with the surrounding highlands. The maximum precipitation occurs in late summer, mainly as a result of thunderstorms. The average annual snowfall is about 45 to 55 inches (115 to 140 centimeters) (USDA, NRCS 2006).

All of the tabular data below was calculated from the PRISM dataset (1971-2000) and is specific to the Lowlands LRU in the Yukon Flats Lowlands MLRA.

Table 3. Representative climatic features

Frost-free period (characteristic range)	45-97 days
Freeze-free period (characteristic range)	70-120 days
Precipitation total (characteristic range)	203-330 mm
Frost-free period (average)	75 days
Freeze-free period (average)	
Precipitation total (average)	254 mm

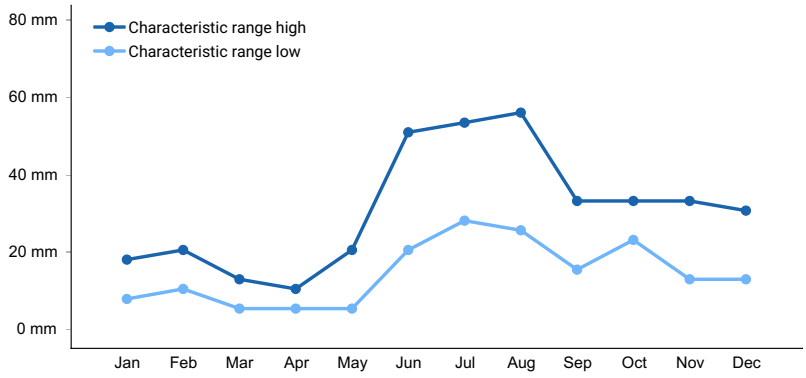


Figure 2. Monthly precipitation range

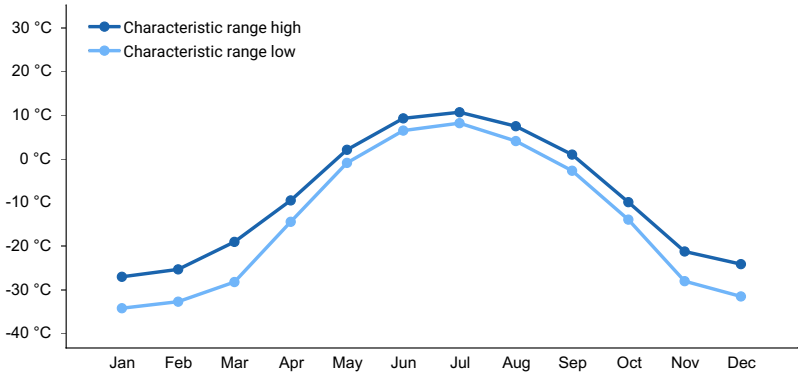


Figure 3. Monthly minimum temperature range

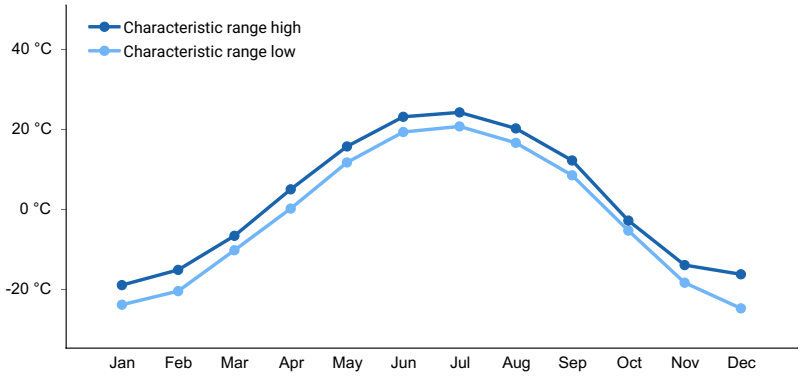


Figure 4. Monthly maximum temperature range

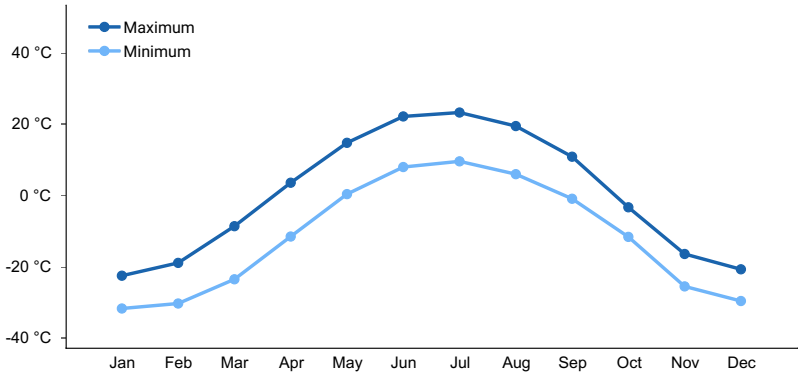


Figure 5. Monthly average minimum and maximum temperature

Influencing water features

During the early growing season (May and June), a water table commonly occurs at moderate depths in the soil profile (between 20 and 40 inches). This time period is when rivers typically have peak volume in the Yukon Flats Lowlands , which directly impacts the water table in the soil profile. During the early growing season, overland flooding occurs occasionally (5 to 50 times in 100 years) for long periods of time (between 7 and 30 days). After the early growing season, the water drains from these soils. During the rest of the growing season, a water table is typically no longer observed in the soil profile (60+ inches). The typical depth to the water table was determined through field observation and by the presence of redoximorphic features in the soil profile.

Soil features

Correlated soil components for Yukon Flats Area, Alaska (AK685): Hodzana and Theodore.

Figure 6. Typical soil profile of Theodore soil component.

Table 4. Representative soil features

Parent material	(1) Organic material (2) Alluvium
Family particle size	(1) Coarse-loamy (2) Coarse-loamy over sandy or sandy-skeletal
Drainage class	Moderately well drained

Ecological dynamics

Flooding

All major tributaries within the Yukon Flats Lowlands have low, middle, and/or high flood plain ecological sites. These flood plain ecological sites represent major breaks in the flood regime (i.e. flood frequency and flood duration) and dominant vegetative type on associated tributaries. The low flood plain ecological site is thought to flood frequently (>50 times in 100 years) for long durations of time (7 to 30 days) and supports a willow (Salix spp.) dominant reference plant community. The middle flood plain ecological site is thought to flood occasionally for long durations of time and supports a balsam poplar dominant reference plant community. The high flood plain ecological site is thought to flood occasionally for brief durations of time (2 to 7 days) and supports a white spruce (*Picea glauca*) dominant reference plant community.

The shift of vegetative type from willow to white spruce dominance represents riparian primary succession along major tributaries in the Yukon Flats Lowlands MLRA. This successional process is thought to take between 200 and 300 years in Interior Alaska (Chapin et al. 2006). The flood regime, growth traits of vegetation, biotic competition, and a slew of other factors contribute to the dynamic nature of boreal flood plain succession. For more detailed information on boreal flood plain succession and successional drivers, refer to Walker et al. (1986) and Chapin et al. (2006).

Field work indicates that certain sampled communities within the reference state flood more frequently and/or severely then other communities. As flooding frequency decreases, balsam poplar cover increases and shrubby understory vegetation decreases. Given this observation, a more frequently flooded community was incorporated into the reference state (community 1.2). This plant community likely represents the transition in succession from the low to middle flood plain.

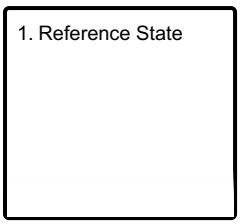
Other Observations

Animal use (browsing and grazing) of this ecological site primarily consists of slight moose browse on willow, which was common in each community phase. A browse severity rating of slight on willow is defined as a majority of individuals having no signs of browsing.

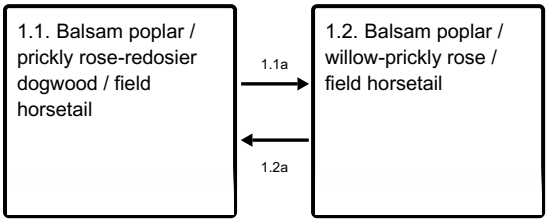
No alternative states for this ecological site were documented.

State and transition model

Ecosystem states



State 1 submodel, plant communities



State 1
Reference State

Figure 7. The Yukon River flood plain. This ecological site occurs on the flood plain of large tributaries in the Yukon Flats Lowlands MLRA.

The reference state has two associated plant communities. These communities are grouped by the structure and dominance of the vegetation (e.g., coniferous trees, deciduous trees, shrubs, and forbs) and their ecological function and stability. Plant communities in the reference state appear to be largely controlled by the influences of flooding. As flooding becomes less frequent and lasts for shorter durations of time, white spruce gain dominance and the ecological site shifts to the high flood plain. This report provides baseline vegetation inventory data for the ecological site. More data collection is needed to provide further information about existing plant communities and the disturbance regimes that would result in transitions from one community or state to another. The common and scientific plant names are from the USDA PLANTS database. All communities in this report are characterized using the Alaska Vegetation Classification (Viereck et al. 1992).

Community 1.1
Balsam poplar / prickly rose-redosier dogwood / field horsetail

Figure 8. Typical plant community associated with community 1.1.

Community Phase 1.1 Canopy Cover Table

Vegetation information is provided as frequency (percent) and mean canopy cover (percent) of the most dominant and ecologically relevant species for this community phase. 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	balsam poplar	*Populus balsamifera*	POBA2	100	60 (50-75)
T	white spruce	*Picea glauca*	PIGL	60	2 (0-6)
S	prickly rose	*Rosa acicularis*	ROAC	100	25 (2-80)
S	thinleaf alder	*Alnus incana* ssp. *tenuifolia*	ALINT	90	10 (0-30)
S	redosier dogwood	*Cornus sericea*	COSE16	80	20 (0-45)
S	feltleaf willow	*Salix alaxensis*	SAAL	40	5 (0-20)
F	field horsetail	*Equisetum arvense*	EQAR	100	35 (0.1-70)

This dataset comes from ten sample plots. The plots occur across the survey area and are independent of one another.

Values for tall, medium, regenerative, and stunted tree strata are used to calculate mean canopy cover and range values. Regenerative trees are not considered part of the overstory canopy.

Plant functional group classifications—T = trees, S = shrubs, G = graminoids, F = forbs, B = bryophytes, and 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 9. Canopy cover table for community 1.1.

Plant community 1.1 is characterized as a closed deciduous forest (60-100 percent cover) primarily composed of mature balsam poplar. The majority of the balsam poplar is similar in size and occurs primarily in the tall tree stratum (greater than 40 feet in height). Seedlings of white spruce are common but cover is generally low. The soil surface is covered primarily by herbaceous litter and woody debris. Commonly observed understory species include prickly rose, thinleaf alder, redosier dogwood, feltleaf willow, and field horsetail. The understory vegetative strata that characterize this community are medium shrubs (between 3 and 10 feet in height) and medium forbs (4 to 24 inches in height). White spruce trees were sampled for diameter at breast height (dbh), height, and age at dbh (6 trees total). The basal area of the stand and the site index were determined for each sample plot. The mean dbh is 4.4 inches (ranging from 2.5 to 10.6), the mean height is 22 feet (ranging from 11 to 52), and the mean age is 26 years (ranging from 16 to 56). The mean basal area of the stands is 112 (ranging from 58 to 140), and mean site index is 57 (ranging from 42 to 73) (Farr 1967).

Dominant plant species

- balsam poplar (*Populus balsamifera*), tree
- white spruce (*Picea glauca*), tree
- prickly rose (*Rosa acicularis*), shrub
- thinleaf alder (*Alnus incana ssp. tenuifolia*), shrub
- redosier dogwood (*Cornus sericea*), shrub
- feltleaf willow (*Salix alaxensis*), shrub
- field horsetail (*Equisetum arvense*), other herbaceous

Community 1.2
Balsam poplar / willow-prickly rose / field horsetail

Figure 10. Typical plant community associated with community 1.2.

Community Phase 1.2 Canopy Cover Table

Vegetation information is provided as a frequency (percent) and mean canopy cover (percent) of the most dominant and ecologically relevant species for this community phase. 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	balsam poplar	*Populus balsamifera*	POBA2	100	25 (6-50)
T	white spruce	*Picea glauca*	PIGL	86	8 (0-20)
S	willow	*Salix spp.*	SALIX	100	60 (30-100)
S	prickly rose	*Rosa acicularis*	ROAC	100	15 (1-30)
S	redosier dogwood	*Cornus sericea*	COSE16	86	20 (0-80)
S	thinleaf alder	*Alnus incana* ssp. *tenuifolia*	ALINT	86	15 (0-40)
F	field horsetail	*Equisetum arvense*	EQAR	57	6 (0-30)

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

Values for tall, medium, regenerative, and stunted tree strata are used to calculate mean canopy cover and range values. Regenerative trees are not considered part of the overstory canopy.

Plant functional group classifications—T = trees, S = shrubs, G = graminoids, F = forbs, B = bryophytes, and 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 11. Canopy cover table for community 1.2.

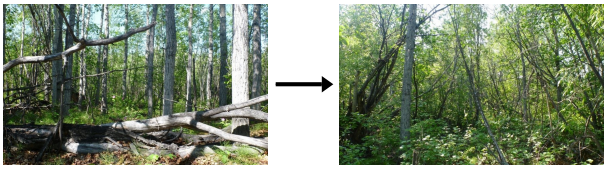
Plant community 1.2 is thought to flood more frequently and flood for longer durations of time then plant community 1.1. It is characterized as deciduous woodland (10 to 25 percent cover), which is primarily composed of balsam poplar. Balsam poplar cover is generally split between immature medium-sized trees (between 15 and 40 feet) and

regenerative trees (less than 15 feet). Seedlings of white spruce are common but cover is generally low. The soil surface is covered primarily by herbaceous litter and woody debris. Commonly observed understory species include prickly rose, a mixture of willow (most dominantly *Salix alaxensis*, *S. arbusculoides*, and *S. bebbiana*), thinleaf alder, redosier dogwood, and field horsetail. The understory vegetative strata that characterize this community are medium shrubs (between 3 and 10 feet in height) and tall shrubs (greater than 10 feet in height).

Dominant plant species

- balsam poplar (*Populus balsamifera*), tree
- white spruce (*Picea glauca*), tree
- feltleaf willow (*Salix alaxensis*), shrub
- littletree willow (*Salix arbusculoides*), shrub
- Bebb willow (*Salix bebbiana*), shrub
- prickly rose (*Rosa acicularis*), shrub
- thinleaf alder (*Alnus incana ssp. tenuifolia*), shrub
- field horsetail (*Equisetum arvense*), other herbaceous

Pathway 1.1a
Community 1.1 to 1.2

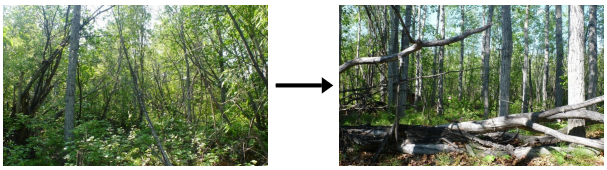


Balsam poplar / prickly rose-redosier dogwood / field horsetail

Balsam poplar / willow-prickly rose / field horsetail

More frequent flooding. The reference state for this ecological site floods occasionally for long periods of time. Areas that are thought to flood less frequently are represented by plant community 1.1 and areas that are thought to flood more frequently are represented by plant community 1.2. When compared to community 1.1, the more frequently flooded plant community (community 1.2) has less balsam poplar cover and greater shrub cover.

Pathway 1.2a
Community 1.2 to 1.1



Balsam poplar / willow-prickly rose / field horsetail

Balsam poplar / prickly rose-redosier dogwood / field horsetail

Less frequent flooding. The reference state for this ecological site floods occasionally for long periods of time. Areas that are thought to flood less frequently are represented by plant community 1.1 and areas that are thought to flood more frequently are represented by plant community 1.2. When compared to community 1.1, the more frequently flooded plant community (community 1.2) has less balsam poplar cover and greater shrub cover.

Additional community tables

Table 5. Community 1.1 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height (M)	Canopy Cover (%)	Diameter (Cm)	Basal Area (Square M/Hectare)
Tree							
balsam poplar	POBA2	*Populus balsamifera*	Native	8.2–21.3	50–75	16.5–46.5	–
white spruce	PIGL	*Picea glauca*	Native	3.4–15.8	0–6	6.4–26.9	–

Table 6. Community 1.2 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height (M)	Canopy Cover (%)	Diameter (Cm)	Basal Area (Square M/Hectare)
Tree							
balsam poplar	POBA2	*Populus balsamifera*	Native	9.1–11.3	6–50	11.7–17.3	–
white spruce	PIGL	*Picea glauca*	Native	3.7–6.4	0–20	3.3–12.2	–

Inventory data references

NASIS User Site ID / Modal Datasets
12NR02304 plant community 1.1
10BB02305 plant community 1.1
10BL03301 plant community 1.1
10BL03302 plant community 1.1
10BL03303 plant community 1.1
10BL03304 plant community 1.1
10BL04601 plant community 1.1
11BB05702 plant community 1.1
12NR00104 plant community 1.1
12NR04501 plant community 1.1
13NR01302 plant community 1.1
2015AK290405 plant community 1.1
10BB02603 plant community 1.2
10BL03404 plant community 1.2
11BB06605 plant community 1.2
13BS00203 plant community 1.2
12NR00501 plant community 1.2

Other references

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Contributors

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Approval

Michael Margo, 5/11/2020

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	05/07/2020
Approved by	Michael Margo
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:**

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):**

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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:**
