

Ecological site XA232X01Y221

Boreal Forest Loamy Terraces

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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): 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 LRU—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 moderately well to well drained soils on the tread of stream terraces in the Yukon Flats Lowlands MLRA. A water table is typically not observed in the soil profile during the growing season. The reference state supports multiple community phases related to a fire regime. Reference plant community 1.1 is characterized as an open needleleaf forest (25 to 60 percent cover) primarily composed of mature white spruce. Commonly observed understory species include grayleaf willow, russet buffaloberry, twinflower, purple reedgrass, false toadflax, splendid feathermoss, Ptilidium liverwort, and greygreen reindeer lichen.

Associated sites

XA232X01Y229	Boreal Scrub Loamy Terrace Swales This ecological site is associated with swales on stream terraces in lowlands region of the Yukon Flats Lowlands MLRA. Associated soils are considered very poorly drained. The reference plant community is characterized as open tall scrub (Viereck et al. 1992) and the dominant shrubs are willow (<i>Salix</i> spp.) and shrub birch (<i>Betula glandulosa</i>).
XA232X01Y280	Boreal Scrub Loamy Flood Plain Wet This ecological site occurs on the flood plain and adjacent terraces of minor, low-gradient tributaries in the lowlands region of the Yukon Flats Lowlands MLRA. The reference plant community is associated with soils that both pond and flood. The reference plant community phase is characterized as closed tall scrub (greater than 75 percent shrub cover; Viereck et al. 1992) primarily composed of a mixture of willow (<i>Salix</i> spp.).
XA232X01Y219	Boreal Forest Loamy Terraces Moist This ecological site is associated with somewhat poorly to moderately well drained soils on the treads of stream terraces in the Yukon Flats Lowlands MLRA. Flooding frequency ranges from rare to none. The reference plant community is characterized as an open needleleaf forest (25 to 60 percent cover) primarily composed of mature white spruce (<i>Picea glauca</i>).
XA232X01Y224	Boreal Woodland Sandy Terrace Rises This ecological site is associated with vegetated dunes on treads of stream terraces in the lowlands region of the Yukon Flats Lowlands MLRA. 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 (<i>Picea glauca</i>).
XA232X01Y222	Boreal Graminoid Loamy Terrace Depressions This ecological site is associated with closed depressions of stream terraces that support a reference state with multiple graminoid-dominant community phases. These depressions are considered closed because they are not associated with a flood regime and have limited, if any, groundwater flow or recharge. The presumed hydrological inputs for this ecological site are primarily thaw of the annual active soil layer and/or permafrost, snowmelt runoff, and precipitation. This hydrologic regime results in the development of sodic soil properties.
XA232X01Y262	Boreal Woodland Gravelly Terraces This ecological site is associated with wet soils on the tread of gravelly stream terraces in the lowlands region of the Yukon Flats Lowlands MLRA. Gravelly horizons range from very shallow to shallow depths (0 to 20 inches) and soils lack permafrost at depth. The pH of soil horizons commonly range from neutral to moderately alkaline, which leads to diverse species assemblages. The reference plant community phase is characterized as a needleleaf woodland (10 to 25 percent cover; Viereck et al. 1992) composed primarily of black spruce (<i>Picea mariana</i>) and white spruce (<i>Picea glauca</i>).
XA232X01Y201	Boreal Woodland Peat Frozen Terraces This ecological site occurs in organic rich bogs in the lowlands and marginal uplands regions of the Yukon Flats Lowlands MLRA. The cumulative thickness of organic material often exceeds 50 inches in the soil profile. Reference state soils are poorly drained and organic material is considered ultra to extremely acidic. The soils associated with the reference plant community generally has permafrost at moderate depth (20 to 40 inches). This ecological site has an alternative state related to thermokarst.

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 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 (<i>Salix</i> spp.).
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 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 (<i>Calamagrostis canadensis</i>).
XA232X01Y209	Boreal Tussock Loamy Frozen Terraces This ecological site occurs on stream terraces in the lowlands region of the Yukon Flats Lowlands MLRA. Soils commonly have permafrost at moderate depth (20 to 40 inches) and pond frequently for very long durations. The reference plant community is characterized as open low mixed shrub-sedge tussock bog (Viereck et al. 1992).
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 (<i>Salix</i> spp.) and alder (<i>Alder</i> spp.).
XA232X01Y212	Boreal Sedge Peat Terrace Depressions This ecological site is associated with drainageways on stream terraces in the lowlands region of the Yukon Flats Lowlands MLRA. Associated drainageways are very poorly drained and have a water table that remains above the soil surface for the entire growing season. The reference plant community phase is characterized as subarctic lowland sedge wet meadow (Viereck et al. 1992) and is composed primarily of water sedge (<i>Carex aquatilis</i>).
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 (<i>Picea glauca</i>).
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 (<i>Picea mariana</i>) and white spruce (<i>Picea glauca</i>).

XA232X01Y223	Boreal Scrub Loamy Frozen Terrace Depressions This shrubby ecological site occurs in the transitional area between the forested tread of a stream terrace and the graminoid-dominant communities associated with closed, terrace depressions (ecological site R232XY222AK). This site typically occurs between the outer third and lip of these closed depressions. The reference plant community for ecological site is characterized as an open tall scrubland (Viereck et al. 1992) and those shrubs are primarily an assortment of willow (<i>Salix</i> spp.).
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Similar sites

XA232X01Y204	Boreal Forest Loamy Flood Plain High XA232X01Y204 is on flood plains and has plant community phases related to a flood regime. As compared to XA232X01Y221, white spruce trees associated with site XA232X01Y204 tend to grow larger and have a higher site index value.
XA232X02Y210	Boreal Forest Loamy Frozen Plains Warm XA232X02Y210 is associated with dry soils on slopes in the marginal uplands LRU. As compared to XA232X01Y221, white spruce trees associated with site XA232X02Y210 tend to grow larger and have a higher site index value.
XA232X01Y219	Boreal Forest Loamy Terraces Moist XA232X01Y219 is in similar landform positions as XA232X01Y221 (tread of stream terraces), but site XA232X01Y219 is associated with wetter soils. As compared to XA232X01Y221, white spruce trees associated with XA232X01Y219 tend to be smaller and have a lower site index value.

Table 1. Dominant plant species

Tree	(1) <i>Picea glauca</i>
Shrub	(1) <i>Geocaulon lividum</i> (2) <i>Calamagrostis purpurascens</i>
Herbaceous	(1) <i>Hylocomium splendens</i> (2) <i>Ptilidium ciliare</i>

Legacy ID

F232XY221AK

Physiographic features

This ecological site and its associated plant communities are throughout the Yukon Flats Lowlands MLRA. Given the large spatial extent, the site is associated with a wide array of soil components. The differences in site characteristics among soils of different ages (young and old) and on different landforms are discussed in this section. All of the soil components, however, support similar kinds and amounts of vegetation.

This ecological site and its associated communities commonly occur on young and old terraces. The Yukon Flats Lowlands MLRA is composed of broad and numerous terrace levels. Individual terrace levels commonly span several miles in all directions, but one level to the next can be separated by less than 25 feet in elevation. These terrace levels can be broadly segregated by age. Young terraces are generally proximal to active stream channels and have a recent or current association with a flood regime (rare flooding, 1 to 5 times in 100 years). While capped with organic material, soils on young terraces are primarily composed of alluvium (Gwichin soils). Flight or

satellite reconnaissance of young terraces results in observance of readily identifiable stream landforms, which in the Yukon Flats Lowlands MLRA commonly include meander scrolls, abandoned channels, and oxbow lakes (see photo below). Old terraces are generally distal from active stream channels and are disconnected from a flood regime. Soils on old terraces are generally composed of eolian deposits and/or loess underlain by alluvium (Tlozhavun and Choonjik soils). The depositional surface material commonly is thick enough to mask stream landforms like abandoned linear channels. From the air, the depressions appear to be circular to amorphous in shape.

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 terraces north of the Yukon River (e.g. Sheenjek River). The soils on these terraces tend to have a sandy and gravelly substrata (e.g., Choonjik, gravelly substratum). These coarsely textured soils are unfavorable for permafrost aggradation in the profile. 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 terrace levels have a loamy substrata that is generally favorable for permafrost aggradation (Choonjik, Gwichin, and Tlozhavun soils).

During the soil survey, many unique soil types were identified because of the differences in the age of the terraces and in the landforms. Each soil type originally had a correspondingly unique ecological site. After more fieldwork and data analysis, it was determined that these wide-ranging soils all appear to support plant communities that respond similarly to fire and have similar kinds and amounts of vegetation in the reference state. For example, the site index for white spruce was similar for all of the correlated soil components, with or without a sandy and gravelly substratum. 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.

Figure 2. Aerial image of a meander scroll adjacent to the Yukon River, which is a landform associated with younger terrace surfaces. Well drained soils on this meander scroll that rarely flood support plant communities associated with ecological site F232XY221AK.

Figure 3. An older stream terrace between the Yukon River and Beaver Creek in the Yukon Flats Lowlands MLRA. Notice the closed depressions that appear to be circular to amorphous in shape.

Table 2. Representative physiographic features

Geomorphic position, terraces	(1) Tread
Landforms	(1) Alluvial plain > Stream terrace (2) Alluvial plain > Stream terrace
Flooding frequency	None to rare
Ponding frequency	None
Elevation	90 – 310 m
Slope	0 %
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)	50-100 days
Freeze-free period (characteristic range)	70-120 days
Precipitation total (characteristic range)	200-330 mm
Frost-free period (average)	80 days
Freeze-free period (average)	
Precipitation total (average)	250 mm

Influencing water features

Soils associated with this ecological site are generally considered well drained and lack an observable water table for the entire growing season. However, the Gwichin soil component is an exception. Gwichin soils have a water table at moderate depth (between 20 and 40 inches) during the early growing season (May/June). After the early growing season, these soils drain and a water table no longer occurs in the soil profile. In this instance, the seasonal water table does not appear to impact white spruce productivity or increase the presence of wetland indicator species.

Soil features

Correlated soil components for the Yukon Flats Area, Alaska soil survey (AK685): Choonjik; Choonjik, gravelly substratum; Gwichin; Tlozhavun; Tlozhavun, moderately deep over gravel; Tlozhavun, shallow over gravel; Typic Cryorthents.

Figure 8. Typical soil profile associated with Tlozhavun, gravelly substratum soil components. Soils with gravelly substratum do not typically have permafrost in the soil profile.

Figure 9. Typical soil profile associated with Choonjik soil component. Soils lacking gravelly substratum can have permafrost at depth.

Table 4. Representative soil features

Parent material	(1) Organic material (2) Loess (3) Alluvium
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Family particle size	(1) Coarse-silty over sandy or sandy-skeletal (2) Coarse-loamy (3) Coarse-silty
Drainage class	Moderately well drained to well drained
Soil depth	200 cm

Ecological dynamics

Fire

In the Yukon Flats Lowlands MLRA, fire is a common and natural event that has a significant control on the vegetation dynamics across the landscape. A typical fire event in areas associated with this ecological site will reset the plant succession and alter dynamic soil properties (e.g., presence or thickness of permafrost). For this ecological site to progress from the pioneering fire stage to the reference plant community phase, data suggest that 100 years or more must elapse without another fire event.

When comparing all MLRAs of Interior Alaska, land in the Yukon Flats Lowlands MLRA burns most frequently (Begét et al. 2006). Within this MLRA, fire is considered a natural and common event that typically is unmanaged. Fire suppression generally occurs adjacent to villages or on allotments with known structures, both of which have a relatively limited acre footprint. From 2000 to 2015, 132 known fire events occurred on land in the Yukon Flats Lowlands MLRA and the burn perimeter of the fires totaled about 4.1 million acres (AICC 2016). Fire-related disturbances are highly patchy and can leave undisturbed areas within the burn perimeter. Ten of the fire events were attributed to human activities (affecting a total of 2,864 acres), but the majority were caused by lightning strikes (AICC 2016).

The fire regime within Interior Alaska follows two basic scenarios—low-severity burns and high-severity burns. It should be noted, however, that the fire regime in Interior Alaska is generally thought to be much more complex (Johnstone et al. 2008). Burn severity refers to the proportion of the vegetative canopy and organic material consumed in a fire event (Chapin et al. 2006). Fires in cool and moist habitat tend to result in low-severity burns, while fires in warm and dry habitat tend to result in high-severity burns. As a result of field observations and because the associated soils are warm and well drained, the typical fire scenario for this ecological site is considered to result in a high-severity burn.

Large portions of the organic mat are consumed during a high-severity fire event, commonly exposing pockets of mineral soil. The loss of this organic mat, which insulates the mineral soil, and the decrease in site albedo tends to cause overall soil temperatures to increase (Hinzman et al. 2006). In areas that have permafrost before a fire event, the increase in soil temperatures leads to a decrease in the depth to the permafrost or loss of permafrost in the soil profile (Hinzman et al. 2006). For this ecological site, permafrost was typically not observed in the soil profiles after recent fire events and a soil component was developed for this change in dynamic soil properties (Typic Cryorthents soils). For soils with loamy substratum, data from fieldwork indicate that permafrost aggradation in the soil profile typically does not occur until community phase 1.2 and that permafrost is commonly associated with community phase 1.1. Fire events also destroy a majority of the vascular and nonvascular biomass above ground.

Field data suggest that each of the forested communities will burn and that fire events will cause a transition to the pioneering stage of fire succession. This stage (community 1.5) is a mix of species that either regenerate in place (e.g., subterranean root crowns for willow and rhizomes for graminoids) and/or from wind-dispersed seed or spores that colonize exposed mineral soil (e.g., quaking aspen [*Populus tremuloides*] and *Ceratodon* moss [*Ceratodon purpureus*]). The pioneering stage of fire succession is primarily composed of tree seedlings, forbs, grasses, and weedy bryophytes. Willow (*Salix* spp.) and deciduous tree seedlings continue to colonize and grow on recently burned sites until they become dominant in the overstory, which marks the transition to the early stage of fire succession (community 1.4). In the absence of fire, tree species continue to become more dominant in the stand. The later stages of succession have an overstory that is dominantly deciduous trees (community 1.3), a mix of broadleaf and needleleaf trees (community 1.2), or needleleaf trees (community 1.1).

The time elapsed since the most recent fire event plays a large role in determining the community observed in the field. Using data from the burn perimeter (AICC 2016) and tree age, the pioneering fire stage is thought to persist for up to 10 years post fire and the early fire community persists about 10 to 30 years postfire. After approximately 30 years, an open forest with some combination of aspen and white spruce will persist until the next fire event. Field data suggest that broadleaf trees (primarily quaking aspen) are dominant in the canopy structure during the first 30 to 60 years post fire. During this timeframe, white spruce colonizes and matures in the understory. Eventually, white spruce gains dominance in the overstory and begins to replace the shade-intolerant broadleaf tree species. Late-fire community 1.2 has a mixture of immature and mature white spruce, while the reference community 1.1 has a stand composed primarily of mature white spruce. The average age of white spruce in the reference state is 105 years; therefore, it takes more than a century to

progress from the pioneering stage to the reference community phase.

Given the high frequency of fire and its associated footprint, much of the land in the Yukon Flats Lowlands MLRA has burned too recently to support the reference plant community. GIS data and flight reconnaissance have made it apparent that large swaths of mature white spruce forests are uncommon throughout the MLRA. Mixed and open broadleaf forests have the greatest spatial representation in the Yukon Flats Lowlands MLRA.

Flooding

Historical flood markers in Fort Yukon and aerial observations conducted by U.S. Fish and Wildlife Service staff (personal communication) have shown that flooding occurs on the young terraces that support this ecological site.

While conducting fieldwork, little if any evidence of flood-related disturbance was observed. Thus, no flood-related community phases were developed for this ecological site. A flood event in areas associated with this site likely has limited energy, depositing alluvium on the soil surface but causing minimal alterations to overall composition of the plant community.

Other Observations

Future research and field studies may determine that the correlated soil components respond differently to anthropogenic disturbance or have varying degrees of agricultural value. In addition, more focused studies on the productivity of forested stands may indicate differences in timber quality among the correlated soil components. The present data, however, support the correlation of multiple soil components to this ecological site.

Animal use (browsing and grazing) of this ecological site primarily consists of slight moose browse on willow and tree regeneration. A browse severity rating of slight on willow and tree regeneration 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

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 6. Community 1.1 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height M	Canopy Cover (%)	Diameter Cm	Basal Area (square M/hectare)
Tree							
white spruce	PIGL	<i>Picea glauca</i>	Native	5.8-29.3	20-75	5.6-50	–

Table 7. Community 1.1 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (m)	Canopy Cover (%)
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Table 8. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 1.2 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height M	Canopy Cover (%)	Diameter Cm	Basal Area (square M/hectare)
Tree							
white spruce	PIGL	<i>Picea glauca</i>	Native	4.9-26.8	10-70	4.6-49.3	–
quaking aspen	POTR5	<i>Populus tremuloides</i>	Native	–	–	–	–

Table 10. Community 1.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 11. Community 1.3 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height M	Canopy Cover (%)	Diameter Cm	Basal Area (square M/hectare)
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Tree							
quaking aspen	POTR5	<i>Populus tremuloides</i>	Native	–	10-75	–	–
white spruce	PIGL	<i>Picea glauca</i>	Native	2.4-21	0-20	3.3-32	–

Table 12. Community 1.4 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()		Foliar Cover (%)	
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Table 13. Community 1.4 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height M	Canopy Cover (%)	Diameter Cm	Basal Area (square M/hectare)
Tree							
quaking aspen	POTR5	<i>Populus tremuloides</i>	Native	0.3-4.6	0.1-30	–	–
balsam poplar	POBA2	<i>Populus balsamifera</i>	Native	0.3-4.6	0-11	–	–
white spruce	PIGL	<i>Picea glauca</i>	Native	0.3-4.6	0.1-5	–	–

Table 14. Community 1.5 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()		Foliar Cover (%)	
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Table 15. Community 1.5 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height M	Canopy Cover (%)	Diameter Cm	Basal Area (square M/hectare)
Tree							
quaking aspen	POTR5	<i>Populus tremuloides</i>	Native	0.3-4.6	0-70	–	–

Table 16. Representative site productivity

Common Name	Symbol	Site Index Low	Site Index High	CMAI Low	CMAI High	Age Of CMAI	Site Index Curve Code	Site Index Curve Basis	Citation
white spruce	<i>PIGL</i>	37	73	–	–	–	–	–	

Inventory data references

NASIS User Site ID / Modal Datasets 10BL00903 F232XY221AK community 1.1 10BL01403 F232XY221AK community 1.1 10BL02004 F232XY221AK community 1.1 11BB05305 F232XY221AK community 1.1 11BB06202 F232XY221AK community 1.1 11BB06705 F232XY221AK community 1.1 11BB07301 F232XY221AK community 1.1 11TD09201 F232XY221AK community 1.1 12NR00403 F232XY221AK community 1.1 12NR00603 F232XY221AK community 1.1 12NR02003 F232XY221AK community 1.1 12NR02602 F232XY221AK community 1.1 12NR02802 F232XY221AK community 1.1 12SN00203 F232XY221AK community 1.1 12SN01202 F232XY221AK community 1.1 12TR00603 F232XY221AK community 1.1 12TR00803 F232XY221AK community 1.1 13BA00902 F232XY221AK community 1.1 13BA01501 F232XY221AK community 1.1 13BA01702 F232XY221AK community 1.1 13NR01405 F232XY221AK community 1.1 13NR01501 F232XY221AK community 1.1 13NR02103 F232XY221AK community 1.1 14AK2903031 F232XY221AK community 1.1 14DM00303 F232XY221AK community 1.1 14NR02101 F232XY221AK community 1.1 14NR02501 F232XY221AK community 1.1 14NR02701 F232XY221AK community 1.1 14NR02904 F232XY221AK community 1.1 2015AK290461 F232XY221AK community 1.1 2015AK290621 F232XY221AK community 1.1 2015AK290624 F232XY221AK community 1.1 2015AK290667 F232XY221AK community 1.1 2015AK290989 F232XY221AK community 1.1 2015AK290997 F232XY221AK community 1.1 S2012AK290002 F232XY221AK community 1.1 S2013AK290001 F232XY221AK community 1.1 S2014AK290001 F232XY221AK community 1.1 S2014AK290002 F232XY221AK community 1.1 10BB00903 F232XY221AK community 1.2 10BB01101 F232XY221AK community 1.2 10BB01203 F232XY221AK community 1.2 10BB01302 F232XY221AK community 1.2 10BB01303 F232XY221AK community 1.2 10BB01603 F232XY221AK community 1.2 10BB01903 F232XY221AK community 1.2 10BL01003 F232XY221AK community 1.2 10BL01103 F232XY221AK community 1.2 10BL01203 F232XY221AK community 1.2 10BL01703 F232XY221AK community 1.2 10BL01705 F232XY221AK community 1.2 11BB05002 F232XY221AK community 1.2 11BB05902 F232XY221AK community 1.2 11BB07102 F232XY221AK community 1.2 11BB07103 F232XY221AK community 1.2 11SN03401 F232XY221AK community 1.2 11TD09305 F232XY221AK community 1.2 11TD09502 F232XY221AK community 1.2 12BB00801 F232XY221AK community 1.2 12NR01902 F232XY221AK community 1.2 12NR02002 F232XY221AK community 1.2 12SN00101 F232XY221AK community 1.2 12SN00102 F232XY221AK community 1.2 12SN00404 F232XY221AK community 1.2 12SN01103 F232XY221AK community 1.2 12SN01203 F232XY221AK community 1.2 12SN01402 F232XY221AK community 1.2 12TR01004 F232XY221AK community 1.2 13BA01201 F232XY221AK community 1.2 13BA01302 F232XY221AK community 1.2 14AK2903117 F232XY221AK community 1.2 14DM00403 F232XY221AK community 1.2 14NR00102 F232XY221AK community 1.2 14NR00201 F232XY221AK community 1.2 14NR00601 F232XY221AK community 1.2 14NR00603 F232XY221AK community 1.2 14NR01101 F232XY221AK community 1.2 14NR02601 F232XY221AK community 1.2 2015AK290408 F232XY221AK community 1.2 2015AK290418 F232XY221AK community 1.2 2015AK290459 F232XY221AK community 1.2 2015AK290620 F232XY221AK community 1.2 2015AK290638

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Type locality

Location 1: Yukon-Koyukuk County, AK	
Latitude	66° 27'49"
Longitude	-145° 40'41"

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Contributors

Blaine T. Spellman

Approval

Michael Margo, 5/18/2020

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	05/11/2020
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. Number and extent of rills:

2. Presence of water flow patterns:

3. Number and height of erosional pedestals or terracettes:

4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):

5. Number of gullies and erosion associated with gullies:

6. Extent of wind scoured, blowouts and/or depositional areas:

7. Amount of litter movement (describe size and distance expected to travel):

8. Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):

10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:

11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):

12. Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):

Dominant:

Sub-dominant:

Other:

Additional:

13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):

14. Average percent litter cover (%) and depth (in):

15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):

16. Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:
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17. Perennial plant reproductive capability:
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