USDA Natural Resources Conservation Service

Ecological site F220XY430AK
Maritime Forest Sandy Plain Alluvial Fan

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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): 220X–Alexander Archipelago-Gulf of Alaska Coast

The Alexander Archipelago-Gulf of Alaska Coast area consists of a narrow arc of islands and lower elevation coastal mountains in the Southern Alaska Region. This area spans from the Alexander Archipelago in southeastern Alaska, north and west along the coast of the Gulf of Alaska and Prince William Sound, and further west to the southern tip of the Kenai Peninsula and the northeastern islands of the Kodiak Archipelago. The area makes up about 27,435 square miles (USDA 2006). The terrain primarily consists of low to moderate relief mountains that are deeply incised. Throughout the area glaciers, rivers, and streams have cut deep, narrow to broad valleys. The broader valleys have nearly level to strongly sloping flood plains and stream terraces. Alluvial and colluvial fans and short footslopes are common in the valleys along the base of the mountains. Rocky headlands, sea cliffs, estuaries, and beaches are common along the coast.

This area includes the Municipality of Juneau, Alaska's capital, and a number of smaller coastal towns and villages. Federally administered lands within this MLRA include Admiralty Island National Monument and part of Misty Fjords National Monument, Tongass National Forest, Chugach National Forest, and Glacier Bay, Wrangell-St. Elias, and Kenai Fjords National Parks and Preserves. The southern terminus of the Trans-Alaska Pipeline is in Valdez.

During the late Pleistocene epoch, the entire area was covered with glacial ice. The numerous fjords of the Alexander Archipelago and Prince William Sound were formed chiefly as a result of glacial scouring and deepening of preglacial river valleys. Most glacial deposits have been eroded away or buried by mountain colluvium and alluvium, which cover about 90 percent of the present landscape. The remaining glacial and glaciofluvial deposits are generally restricted to coastal areas. During the Holocene epoch, volcanic activity within and adjacent to this area deposited a layer of volcanic ash of varying thickness on much of the landscape in the southeastern and northwestern parts of the area. Paleozoic, Mesozoic, and Lower Tertiary stratified sedimentary rocks and Cretaceous and Tertiary intrusive rocks underlie much of the area and are exposed on steep mountain slopes and ridges (USDA 2006).

The dominant soil orders in this MLRA are Spodosols, Histosols, and Entisols. Soils in the area typically have a cryic soil temperature regime, an udic moisture regime, and have mixed minerology. Spodosols are common on mountains and hills having been formed in gravelly or cobbly colluvium, glacial till, and varying amounts of silty volcanic ash. These Spodosols commonly range from shallow to deep, are well to somewhat poorly drained, and typically classify as Humicryods or Haplocryods. Histosols that are poorly to very poorly drained occur on footslopes, discharge slopes, and valley floors. These wet histosols commonly classify as Cryosaprists, Cryohemists, and Cryofibrists. Histosols that are well drained occur on steep mountainsides. These dry Histosols commonly classify as Cryofolists. Entisols are common on flood plains, stream terraces, and outwash plains having been formed in silty, sandy, and gravelly to cobbly alluvium. These Entisols are generally deep, range from well to somewhat poorly drained, and commonly classify as Cryaquents and Cryofluvents. Miscellaneous (non-soil) areas make up about 23 percent of the MLRA. The most common miscellaneous areas are avalanche chutes, rock outcrop, rubble land, beaches, river wash, and water.

This area represents the northern extent of the Pacific temperature rainforest and is characterized by productive stands of conifers. Western hemlock and Sitka spruce are the dominant trees on mountains and hills at the lower elevations. Due to warmer temperatures, western red cedar and Alaska cedar are more prevalent in the southern part of the area. Black cottonwood and mixed forest types occur on flood plains. Areas of peat and other sites that are too wet for forest growth support sedge-grass meadows and low scrub. The transition to subalpine and alpine communities typically occurs at elevations between 1500 to 3000 feet (Boggs et al. 2010, Carstensen 2007, Martin et al. 1995), which characterize the vegetation of the Southern Alaska Coastal Mountains area.

For many decades, logging, commercial fishing, and mining have been the primary industrial land uses throughout much of the area. In recent years, changes in public interests, land use policies, and timber economics have contributed to a significant decline in the timber industry. Commercial fishing continues to be an important industry and most communities support a fleet of boats and fishing related facilities. A number of mines operate in the area and others have been prospected and proposed. Tourism and wildland recreation are becoming increasingly important. Subsistence hunting, fishing, and gathering provide food and a variety of other resources to local residents and remain the principal economy for residents of remote villages.

Ecological site concept

This site occurs on alluvial fans and floodplains and form on coastal plains adjacent to mountainous terrain. These broad, low-gradient slopes rarely flood, but when high-intensity flooding does occur, primary succession takes place on newly deposited alluvial sediments. Soils are very deep and range from sandy-skeletal to coarse loamy and as a result soils are well-drained. Soils are udic or aquic udic.

This site supports a reference state comprised of three community phases, driven by geomorphic processes that result in the formation of alluvial fans. The reference community phase is represented by an open broadleaf forest community, the presence of which is dictated temporally and spatially by time since alluvial fan formation. Large depositional events have the potential to uproot woody species, resetting the successional process. A colonizing low-shrub community comprised primarily of Drummond’s mountain-avens, Sitka willow, and buffaloberry is established on the newly formed alluvial fan and is eventually succeeded by a closed tall shrub willow-alder community.

Associated sites

R220XY426AK	**Maritime Shrub Low Flood Plain** Other ecological sites are directly adjacent to or in close proximity to this ecological site. These ecological sites are typically differentiated by one or more criteria, including landform, landform position, associated soils, associated disturbance regimes, and the type and amount of extant plants. The most common associated ecological site is R220XY426AK. In areas where these ecological sites abut, ecotonal plant communities that have characteristics from each ecological site are common.

Similar sites

R220XY425AK	**Maritime Shrub Drainageway** Ecological site R220XY425AK exhibits vegetative communities similar to those of site F220XY430AK. R220XY425AK has a flooding disturbance regime, whereas F220XY430AK does not. This leads to differences in the soil drainage class, runoff potential, depth to the water table, and flooding regime and results in different reference state communities from that of ecological site F220XY430AK.
F220XY427AK	**Maritime Forest Gravelly High Floodplain** Ecological sites F220XY427AK exhibits vegetative communities similar to those of site F220XY430AK. F220XY427AK has a flooding disturbance regime, whereas F220XY430AK does not. This leads to differences in the soil drainage class, runoff potential, depth to the water table, and flooding regime and results in different reference state communities from that of ecological site F220XY430AK.

Figure 1. Ecological site R220XY425AK exhibits similar community assemblages to those of site F220XY430AK, but site R220XY425AK is in drainageways and is subject to a different flooding regime.

Figure 2. Community phase 1.1 of ecological site F220XY426AK, on low flood plains. Site F220XY426AK exhibits similar community assemblages as those of site F220XY430AK.

Table 1. Dominant plant species

Tree	(1) *Populus balsamifera*
Shrub	(1) *Alnus viridis ssp. sinuata*
Herbaceous	(1) *Streptopus amplexifolius* (2) *Dryopteris expansa*

Physiographic features

This site occurs on alluvial fans and floodplains and form on coastal plains adjacent to mountainous terrain. These broad, low-gradient slopes rarely flood, but when high-intensity flooding does occur, primary succession takes place on newly deposited alluvial sediments. The water table is usually more than 60 inches below the soil surface, but can rise to within 12 inches of the surface during wet periods. Slopes generally range from 0-5% with elevations usually between sea level and 500 feet.

Figure 3. Alluvial fan in Glacier Bay National Park and Preserve.

Table 2. Representative physiographic features

Landforms	(1) Coastal plain > Alluvial fan (2) Coastal plain > Flood plain (3) Mountain valleys or canyons > Alluvial fan
Flooding duration	Brief (2 to 7 days)
Flooding frequency	None to rare
Ponding frequency	None
Elevation	0–490 ft
Slope	0–5%
Water table depth	12–60 in
Aspect	W, NW, N, NE, E, SE, S, SW

Table 3. Representative physiographic features (actual ranges)

Flooding duration	Brief (2 to 7 days)
Flooding frequency	None to frequent
Ponding frequency	None
Elevation	0–980 ft
Slope	0–35%
Water table depth	0–72 in

Climatic features

Cloudy skies, moderate temperatures, and abundant rainfall characterize the temperate maritime climate of this site. Frequent winter storms may consist of snow or heavy rainfall. Moderate to strong winds from the south and southeast are common before and during storms throughout the year. Annual precipitation ranges from 44-94 inches, and annual snowfall ranges from 30-70 inches along the coast and up to 200 inches at higher elevations (USDA 2006). The average annual temperature at lower elevations ranges from about 38-43 degrees F (3-6 degrees C). The frost-free period ranges from about 90-140 days, and the freeze-free period ranges from about 125-180 days.

Table 4. Representative climatic features

Frost-free period (characteristic range)	89-139 days
Freeze-free period (characteristic range)	126-181 days

Precipitation total (characteristic range)	44-94 in
Frost-free period (actual range)	77-147 days
Freeze-free period (actual range)	116-184 days
Precipitation total (actual range)	31-140 in
Frost-free period (average)	110 days
Freeze-free period (average)	153 days
Precipitation total (average)	74 in

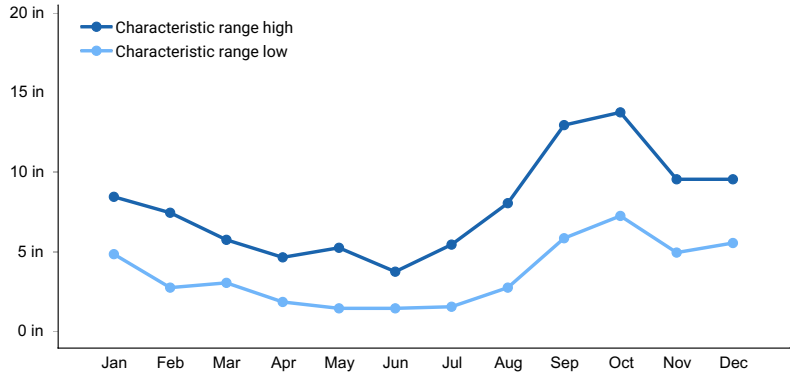


Figure 4. Monthly precipitation range

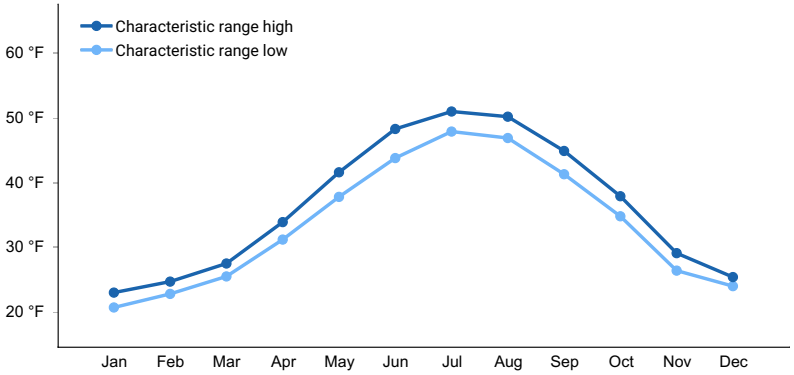


Figure 5. Monthly minimum temperature range

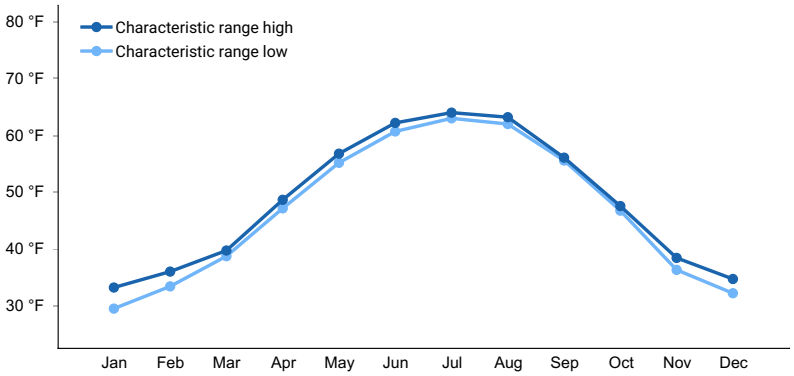


Figure 6. Monthly maximum temperature range

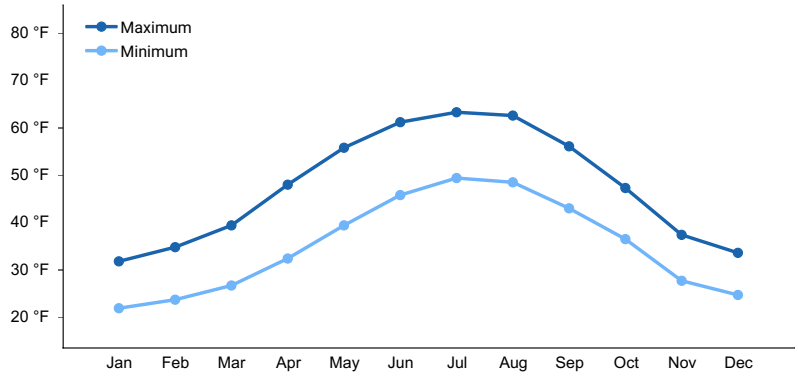


Figure 7. Monthly average minimum and maximum temperature

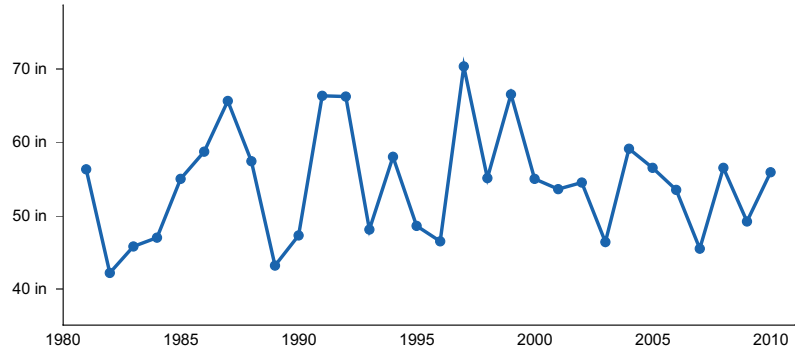


Figure 8. Annual precipitation pattern

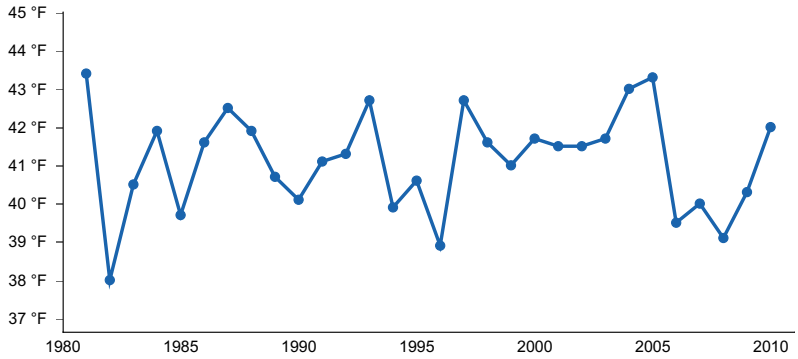


Figure 9. Annual average temperature pattern

Climate stations used

- (1) GUSTAVUS [USW00025322], Gustavus, AK
- (2) GLACIER BAY [USC00503294], Gustavus, AK
- (3) YAKUTAT STATE AP [USW00025339], Yakutat, AK
- (4) SKAGWAY AP [USW00025335], Skagway, AK
- (5) HAINES AP [USW00025323], Haines, AK
- (6) SELDOVIA AP [USW00025516], Homer, AK
- (7) MAIN BAY [USC00505604], Valdez, AK
- (8) CORDOVA M K SMITH AP [USW00026410], Cordova, AK
- (9) SITKA AIRPORT [USW00025333], Sitka, AK
- (10) JUNEAU INTL AP [USW00025309], Juneau, AK
- (11) ANNETTE ISLAND AP [USW00025308], Metlakatla, AK
- (12) PETERSBURG 1 [USW00025329], Petersburg, AK
- (13) KETCHIKAN INTL AP [USW00025325], Ketchikan, AK
- (14) PELICAN [USC00507141], Hoonah, AK

Influencing water features

This site occurs on floodplains and on low-grade alluvial fans where flooding is rare. When high-intensity out-wash events occur resulting in alluvial fan formation, early successional Drummond's mountain-avens is established. Ponding does not exist on this site.

Soil features

The soils of this site are formed in very deep alluvial deposits on floodplains and alluvial fans occurring on glacial-outwash coastal plains directly adjacent to mountainous terrain. Soil textures are primarily sandy-skeletal to coarse loamy and are characterized by udic and aquic udic moisture regimes. Flooding is rare and ponding is not known to occur on these moderately well drained soils.

Figure 10. Typical soil profile for Muirpoint soils in Glacier Bay National Park and Preserve-Gustavus Area, Alaska.

Table 5. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Silt loam (2) Sandy loam (3) Very fine sandy loam
Family particle size	(1) Sandy-skeletal (2) Loamy-skeletal (3) Coarse-loamy over sandy or sandy-skeletal (4) Medial over sandy or sandy-skeletal
Drainage class	Well drained
Permeability class	Moderate
Soil depth	60 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-10in)	1.2–1.8 in
Calcium carbonate equivalent (0-40in)	0%
Clay content (0-20in)	2–9%
Electrical conductivity (0-40in)	0 mmhos/cm
Sodium adsorption ratio (0-40in)	0

Soil reaction (1:1 water) (0-40in)	4.5–7.3
Subsurface fragment volume <=3" (0-60in)	0–50%
Subsurface fragment volume >3" (0-60in)	0–15%

Table 6. Representative soil features (actual values)

Drainage class	Somewhat poorly drained to somewhat excessively drained
Permeability class	Moderate to rapid
Soil depth	60 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-10in)	0–3.9 in
Calcium carbonate equivalent (0-40in)	0%
Clay content (0-20in)	2–10%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	3.5–8.4
Subsurface fragment volume <=3" (0-60in)	0–69%
Subsurface fragment volume >3" (0-60in)	0–27%

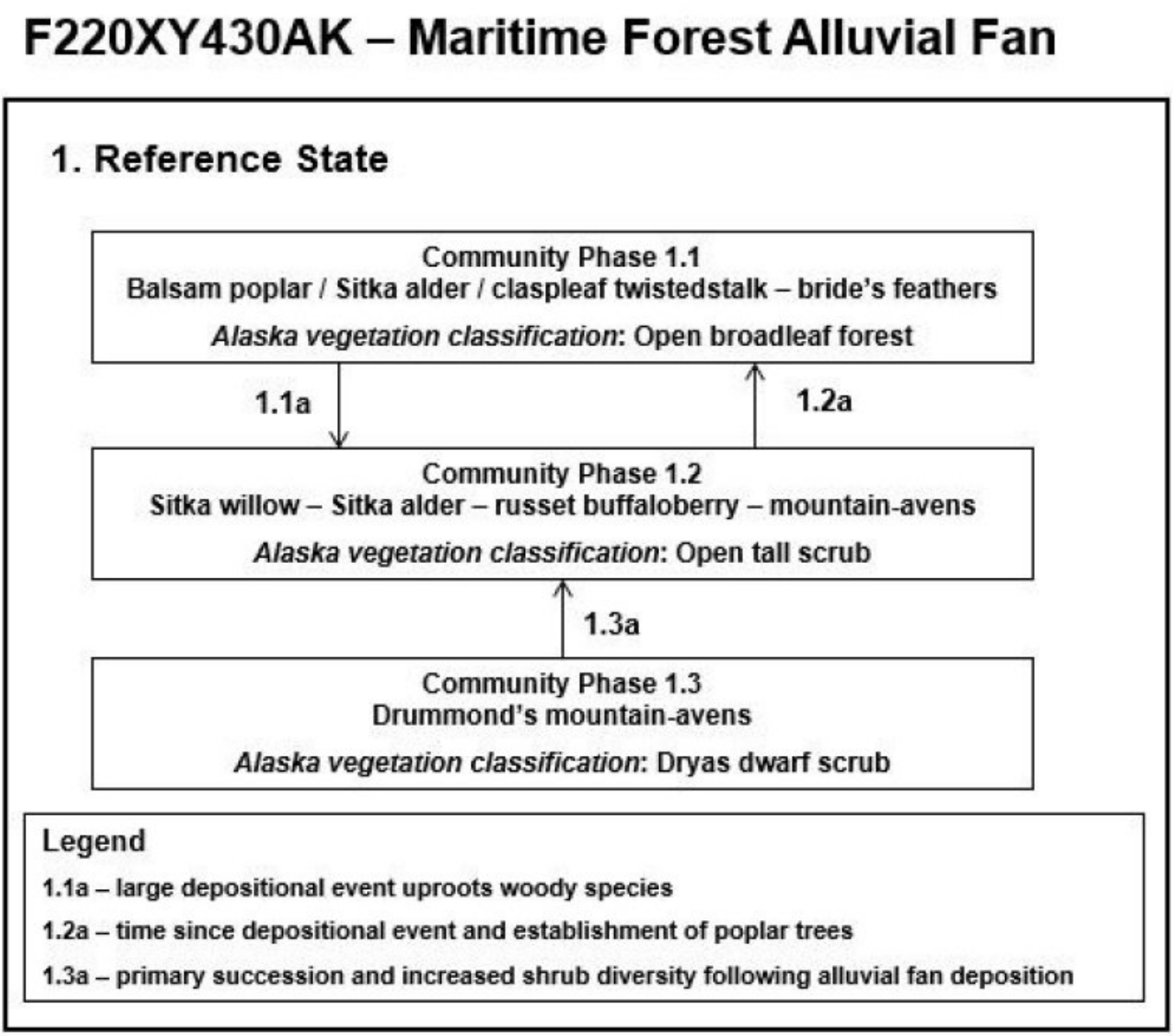
Ecological dynamics

This site is associated with alluvial fans and associated flood plains along the Gulf of Alaska. Until about 10,000 years ago, this area had many continental-scale ice sheets that advanced and retreated many times over millennia (Chapin 1994). The final advance of these glaciers occurred during the Little Ice Age, which peaked about 1750 AD. Since then, many glaciers have thinned and retreated inland, while numerous tidewater glaciers still exist in the area (Lawson 2015). The 250-year glacial retreat is attributed to less regional snowfall in the mountains, rising winter temperatures, and decreased cloud cover and lower precipitation during the growing season in summer (Hall et al. 2003).

During the past 250 years of glacial retreat, meltwater transported and deposited a large amount of silt and sediment via numerous short, high-gradient rivers. Alluvial and colluvial fans and long footslopes are common in the valleys along the base of the mountains.

This site supports a reference state that comprised of three community states, driven by geomorphic processes that result in the formation of alluvial fans. The reference community phase is represented by an open broadleaf forest community, the presence of which is dictated temporally and spatially by time since alluvial fan formation. Large depositional events have the potential to uproot woody species, resetting the successional process. A colonizing low-shrub community comprised primarily of Drummond’s mountain-avens, Sitka willow, and buffaloberry is established on the newly formed alluvial fan and is eventually succeeded by a closed tall shrub willow-alder community. Browsing by moose on willow species has been observed but does not appear to affect the ecological processes enough to alter the communities.

State and transition model



State 1
Reference State

The reference state supports three community phases that result as a function of flooding and succession, both

primary and secondary.

Resilience management. The lack of alternative states suggest the reference state is resilient and/or resistant to disturbance drivers.

Dominant plant species

- balsam poplar (*Populus balsamifera*), tree
- Sitka alder (*Alnus viridis ssp. sinuata*), shrub
- spreading woodfern (*Dryopteris expansa*), other herbaceous

Community 1.1
Balsam poplar / Sitka alder / claspleaf twistedstalk - spreading woodfern

Figure 11. Typical plant community associated with community 1.1.

Community phase 1.1 is characterized as an open broadleaf forest. It is composed primarily of mature balsam poplar with an understory of tall shrubs and medium forbs. Common species include Sitka alder, bride's feathers, claspleaf twistedstalk, spreading woodfern, fragrant bedstraw, common ladyfern, and small enchanter's nightshade. The vegetative strata that characterize this community phase are tall trees, tall shrubs and medium forbs. The ground cover is largely herbaceous debris with some rock fragments and moss. Observed moss species include Schreber's big red stem moss and splendid feathermoss.

Resilience management. Resilience management: This phase has been observed to be resilient and/or resistant to current disturbance drivers, lacking alternative states and at-risk communities.

Dominant plant species

- balsam poplar (*Populus balsamifera*), tree
- Sitka alder (*Alnus viridis ssp. sinuata*), shrub
- claspleaf twistedstalk (*Streptopus amplexifolius*), other herbaceous

Table 7. Soil surface cover

Tree basal cover	55%
Shrub/vine/liana basal cover	41%
Grass/grasslike basal cover	0%
Forb basal cover	40%
Non-vascular plants	7%
Biological crusts	0%
Litter	83%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%

Bedrock	0%
Water	0%
Bare ground	0%

Community 1.2
Sitka willow - Sitka alder / Canadian burnet

Figure 12. Typical plant community associated with community 1.2

Community phase 1.2 is characterized as closed tall scrub. The understory is a diverse assemblage of shrubs and forbs. Common species include Sitka willow, Sitka alder, Drummond's mountain-avens, russet buffaloberry, Canadian burnet, sidebells wintergreen and a variety of other willow . Occasional balsam poplar and quaking aspen seedlings and saplings are present but with low coverages. The vegetative strata that characterize this community phase are tall shrubs and medium forbs. The ground cover is largely composed of herbaceous debris, rock fragments, and various moss species, including Schreber's big red stem moss and splendid feathermoss. Some areas are bare.

Resilience management. Resilience management: This phase has been observed to be resilient and/or resistant to current disturbance drivers, lacking alternative states and at-risk communities.

Dominant plant species

- Sitka alder (*Alnus viridis ssp. sinuata*), shrub
- Sitka willow (*Salix sitchensis*), shrub
- Canadian burnet (*Sanguisorba canadensis*), other herbaceous

Table 8. Soil surface cover

Tree basal cover	0-24%
Shrub/vine/liana basal cover	16-72%
Grass/grasslike basal cover	0%
Forb basal cover	0-5%
Non-vascular plants	5-60%
Biological crusts	0%
Litter	0-93%
Surface fragments >0.25" and <=3"	0-95%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0-30%

Community 1.3
Drummond’s mountain avens - Sitka alder

Figure 13. Typical plant community associated with community 1.3

Community phase 1.3 is characterized as Dryas dwarf scrub. The community is comprised of a mosaic of mostly shrubs, dominantly Drummond’s mountain avens and Sitka alder. Other shrubs include russet buffaloberry and Sitka willow. Occasional balsam poplar seedlings and saplings are present but with low coverages. The vegetative strata that characterize this community phase is low shrubs.The ground cover is herbaceous litter, rock fragments, and some moss species, including Ceratodon moss and Dicranum moss.

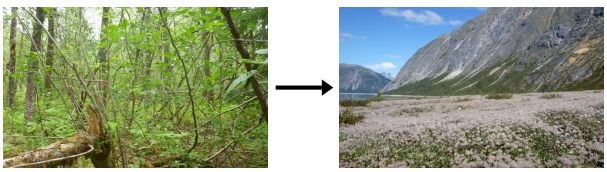
Dominant plant species

- Drummond's mountain-avens (*Dryas drummondii*), shrub

Table 9. Soil surface cover

Tree basal cover	0%
Shrub/vine/liana basal cover	45%
Grass/grasslike basal cover	0%
Forb basal cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	40%
Surface fragments >0.25" and <=3"	58%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

Pathway 1.1a
Community 1.1 to 1.3



Balsam poplar / Sitka alder / claspleaf twistedstalk - spreading woodfern

Drummond’s mountain avens - Sitka alder

Large depositional event uproots woody species

Pathway 1.2a
Community 1.2 to 1.1

Sitka willow - Sitka alder / Canadian burnet

Balsam poplar / Sitka alder / claspleaf twistedstalk - spreading woodfern

Time since depositional even and establishment of poplar trees

Pathway 1.3a
Community 1.3 to 1.2

Drummond's mountain avens - Sitka alder

Sitka willow - Sitka alder / Canadian burnet

Primary succession and increased shrub diversity following alluvial fan deposition

Additional community tables

Table 10. Community 1.1 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height (Ft)	Canopy Cover (%)	Diameter (In)	Basal Area (Square Ft/Acre)

Table 11. Community 1.1 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (Ft)	Canopy Cover (%)
Grass/grass-like (Graminoids)					
tufted hairgrass	DECE	*Deschampsia cespitosa*	–	–	–
Forb/Herb					
claspleaf twistedstalk	STAM2	*Streptopus amplexifolius*	–	–	15
bride's feathers	ARDI8	*Aruncus dioicus*	–	–	10
fragrant bedstraw	GATR3	*Galium triflorum*	–	–	5
small enchanter's nightshade	CIAL	*Circaea alpina*	–	–	2
northern groundcone	BORO	*Boschniakia rossica*	–	–	0–1
largeleaf avens	GEMA4	*Geum macrophyllum*	–	–	0–1
common cowparsnip	HEMA80	*Heracleum maximum*	–	–	0–1
marsh willowherb	EPPA	*Epilobium palustre*	–	–	0–1
variegated scouringrush	EQVA	*Equisetum variegatum*	–	–	0–1
beach strawberry	FRCH	*Fragaria chiloensis*	–	–	0–1
stiff clubmoss	LYAN2	*Lycopodium annotinum*	–	–	0–1
sidebells wintergreen	ORSE	*Orthilia secunda*	–	–	1
Kentucky bluegrass	POPR	*Poa pratensis*	–	–	0–1
western rattlesnakeroot	PRAL	*Prenanthes alata*	–	–	0–1
liverleaf wintergreen	PYAS	*Pyrola asarifolia*	–	–	0–1
Fern/fern ally					
spreading woodfern	DREX2	*Dryopteris expansa*	–	–	5
common ladyfern	ATFI	*Athyrium filix-femina*	–	–	2
Braun's hollyfern	POBR4	*Polystichum braunii*	–	–	0–1
northern hollyfern	POLO4	*Polystichum lonchitis*	–	–	0–1
Shrub/Subshrub					
Sitka alder	ALVIS	*Alnus viridis ssp. sinuata*	–	–	40
devilsclub	OPHO	*Oplopanax horridus*	–	–	0–1
salmonberry	RUSP	*Rubus spectabilis*	–	–	0–1
Sitka willow	SASI2	*Salix sitchensis*	–	–	0–1
Tree					
Sitka spruce	PISI	*Picea sitchensis*	–	–	0–1
Nonvascular					
Schreber's big red stem moss	PLSC70	*Pleurozium schreberi*	–	–	3
splendid feather moss	HYSP70	*Hylocomium splendens*	–	–	2
climacium moss	CLIMA2	*Climacium*	–	–	2

Table 12. Community 1.2 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height (Ft)	Canopy Cover (%)	Diameter (In)	Basal Area (Square Ft/Acre)

Table 13. Community 1.2 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (Ft)	Canopy Cover (%)
Grass/grass-like (Graminoids)					
spike bentgrass	AGEX	*Agrostis exarata*	–	–	0–1
bluejoint	CACA4	*Calamagrostis canadensis*	–	–	0–1

bluejoint	CACA4	*Calamagrostis canadensis*			0–1
little green sedge	CAVI5	*Carex viridula*	–	–	0–1
giant red Indian paintbrush	CAMI12	*Castilleja miniata*	–	–	0–1
foxtail barley	HOJU	*Hordeum jubatum*	–	–	0–1
Kentucky bluegrass	POPR	*Poa pratensis*	–	–	0–1
mountain hairgrass	VAAT2	*Vahlodea atropurpurea*	–	–	0–1
Forb/Herb					
Canadian burnet	SACA14	*Sanguisorba canadensis*	–	–	0–60
liverleaf wintergreen	PYAS	*Pyrola asarifolia*	–	–	0–2
slender bog orchid	PLST4	*Platanthera stricta*	–	–	0–2
sidebells wintergreen	ORSE	*Orthilia secunda*	–	–	0–2
field locoweed	OXCA4	*Oxytropis campestris*	–	–	0–1
fringed grass of Parnassus	PAFI3	*Parnassia fimbriata*	–	–	0–1
marsh grass of Parnassus	PAPA8	*Parnassia palustris*	–	–	0–1
little yellow rattle	RHMI13	*Rhinanthus minor*	–	–	0–1
western pearly everlasting	ANMA	*Anaphalis margaritacea*	–	–	0–1
lyrate rockcress	ARLY2	*Arabis lyrata*	–	–	0–1
alpine milkvetch	ASAL7	*Astragalus alpinus*	–	–	0–1
dwarf fireweed	CHLA13	*Chamerion latifolium*	–	–	0–1
marsh willowherb	EPPA	*Epilobium palustre*	–	–	0–1
variegated scouringrush	EQVA	*Equisetum variegatum*	–	–	0–1
beach strawberry	FRCH	*Fragaria chiloensis*	–	–	0–1
white hawkweed	HIAL2	*Hieracium albiflorum*	–	–	0–1
Fern/fern ally					
spreading woodfern	DREX2	*Dryopteris expansa*	–	–	0–1
Shrub/Subshrub					
Sitka alder	ALVIS	*Alnus viridis ssp. sinuata*	–	–	0–85
Sitka willow	SASI2	*Salix sitchensis*	–	–	1–55
russet buffaloberry	SHCA	*Shepherdia canadensis*	–	–	0–35
Drummond's mountain-avens	DRDR	*Dryas drummondii*	–	–	0–35
Barclay's willow	SABA3	*Salix barclayi*	–	–	0–10
undergreen willow	SACO2	*Salix commutata*	–	–	0–10
feltleaf willow	SAAL	*Salix alaxensis*	–	–	0–5
kinnikinnick	ARUV	*Arctostaphylos uva-ursi*	–	–	0–3
grayleaf willow	SAGL	*Salix glauca*	–	–	0–1
Nonvascular					
splendid feather moss	HYSP70	*Hylocomium splendens*	–	–	0–40
Schreber's big red stem moss	PLSC70	*Pleurozium schreberi*	–	–	0–30
ceratodon moss	CEPU12	*Ceratodon purpureus*	–	–	0–20
dicranum moss	DICRA8	*Dicranum*	–	–	0–10
goose neck moss	RHYTI2	*Rhytidiadelphus*	–	–	0–10
ceratodon moss	CERAT9	*Ceratodon*	–	–	0–5
dicranum moss	DISC71	*Dicranum scoparium*	–	–	0–2
rough goose neck moss	RHTR70	*Rhytidiadelphus triquetrus*	–	–	0–2

	MAPO16	*Marchantia polymorpha*	–	–	0–1

Table 14. Community 1.3 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height (Ft)	Canopy Cover (%)	Diameter (In)	Basal Area (Square Ft/Acre)

Table 15. Community 1.3 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (Ft)	Canopy Cover (%)
Forb/Herb					
field locoweed	OXCA4	*Oxytropis campestris*	–	–	0–1
alpine aster	ASAL3	*Aster alpinus*	–	–	0–1
Shrub/Subshrub					
Drummond's mountain-avens	DRDR	*Dryas drummondii*	–	–	40
russet buffaloberry	SHCA	*Shepherdia canadensis*	–	–	5
Barclay's willow	SABA3	*Salix barclayi*	–	–	0–1
undergreen willow	SACO2	*Salix commutata*	–	–	0–1
Sitka willow	SASI2	*Salix sitchensis*	–	–	0–1

Inventory data references

NASIS plot ID community
13NP02303 community 1.1
13NP05002 community 1.2
13NP04902 community 1.2
13NP04901 community 1.2
13NP02901 community 1.2
13NP02101 community 1.2
13NP02902 community 1.2
13NP05001 community 1.3
13NP04001 community 1.3

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Approval

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Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	05/11/2025
Approved by	Marji Patz
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:**
