Ecological site R220XY461AK
Maritime Scrub Sandy Depressions

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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 in ponded depressions in a variety of landscapes and landforms with deep, coarse-textured soils. In all settings, the water table ranges from several inches above the soil surface (ponded) to 4 inches below the soil surface. These soils are very poorly drained and nutrient poor.

The reference state supports an open low scrubland dominated by sweet gale and a wet herbaceous community dominated by horsetails (Equisetum spp.) and sedges (Carex spp.). Diverse water-loving plants are present in both communities, with wetness as the primary driver of shrub cover. Landform position influences community location, with horsetails in lower areas and shrubs in relatively higher spots. Concurrently, sweet gale and other shrubs are more abundant during relatively dry periods and less abundant when during relatively wet periods.

Associated sites

F220XY460AK	**Maritime Forest Gravelly Alluvial Plains** Site F220XY460AK occurs on terraces and can be adjacent to depressions associated with site R220XY461AK. However site F220XY460AK is not subject to ponding and supports an open coniferous forest.
F220XY432AK	**Maritime Forest Gravelly Plain** Site F220XY432AK occurs on outwash plains and deltas and can be adjacent to depressions associated with site R220XY461AK. However, site F220XY432AK is not subject to ponding and supports open forest vegetation.
F220XY455AK	**Maritime Forest Sandy Coastal Plain** Site F220XY455AK occurs on outwash plains and deltas and can be adjacent to depressions associated with site R220XY461AK. However, site F220XY455AK is not subject to ponding and supports open forest vegetation.
F220XY435AK	**Maritime Forest Loamy Wet Plains** Site F220XY435AK occurs on outwash plains and deltas and can be adjacent to depressions associated with site R220XY461AK. However, site F220XY435AK is not subject to ponding and supports open forest vegetation.
F220XY466AK	**Maritime Forest Sandy Plains Eolian** Site F220XY466AK occurs on eolian hills and dunes and can be adjacent to depressions or dune slacks associated with site R220XY461AK. However, site F220XY466AK is not subject to ponding and supports closed coniferous forest.

Similar sites

F220XY455AK	**Maritime Forest Sandy Coastal Plain** Site F220XY455AK occurs in similar landscape positions, however, it differs from this site because it is not frequently ponded on the soil surface for long periods. Site F220XY455AK is poorly or somewhat-poorly drained and can support an open forest community, whereas this site is very poorly-drained and is too wet to support forest communities.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Myrica gale*
Herbaceous	(1) *Equisetum variegatum*

Physiographic features

This site occurs in coarse-textured wet depressions that are frequently ponded and very poorly drained. These depressions occur on a variety of landscapes and landforms, including outwash plains, alluvial plains, outwash deltas, dune slacks, and fluviomarine terraces. In all settings, the water table ranges from several inches above the soil surface (ponded) to 4 inches below the soil surface throughout the growing season. This site is found at elevations of 0 - 700 feet on slopes ranging from 0 - 3%.

Table 2. Representative physiographic features

Geomorphic position, flats	(1) Dip
Landforms	(1) Outwash plain > Depression (2) Alluvial plain > Depression (3) Shore complex > Dune slack (4) Outwash plain > Outwash delta (5) Shore complex > Fluviomarine terrace
Runoff class	Very low to low
Flooding duration	Brief (2 to 7 days)
Flooding frequency	Rare to occasional
Ponding duration	Long (7 to 30 days) to very long (more than 30 days)
Ponding frequency	Frequent
Elevation	0–213 m
Slope	0–3%
Ponding depth	0–15 cm
Water table depth	0–10 cm
Aspect	W, NW, N, NE, E, SE, S, SW

Table 3. Representative physiographic features (actual ranges)

Runoff class	Very low to low
Flooding duration	Brief (2 to 7 days)
Flooding frequency	None to occasional
Ponding duration	Long (7 to 30 days) to very long (more than 30 days)
Ponding frequency	Frequent
Elevation	0–213 m
Slope	0–3%
Ponding depth	0–15 cm
Water table depth	0–10 cm

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)	95-142 days
Freeze-free period (characteristic range)	147-183 days
Precipitation total (characteristic range)	1,397-3,683 mm
Frost-free period (actual range)	84-170 days
Freeze-free period (actual range)	119-218 days
Precipitation total (actual range)	889-4,369 mm
Frost-free period (average)	120 days
Freeze-free period (average)	168 days
Precipitation total (average)	2,464 mm

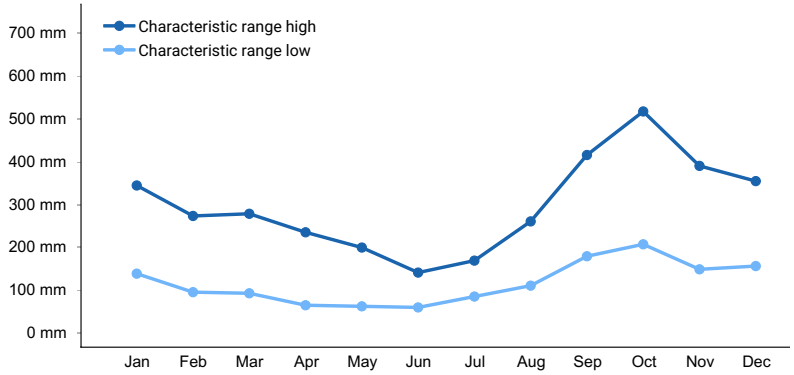


Figure 1. Monthly precipitation range

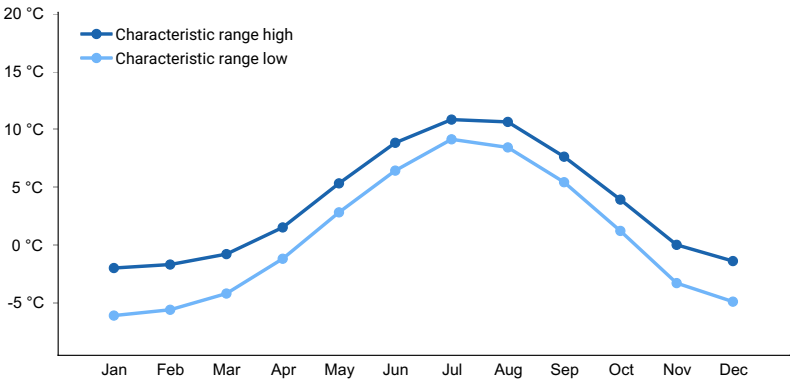


Figure 2. Monthly minimum temperature range

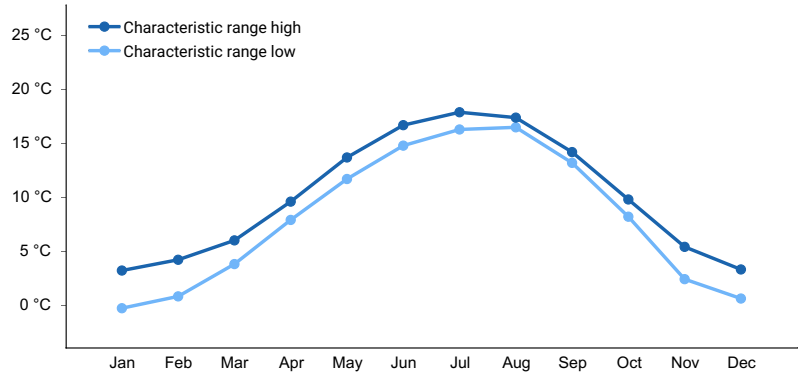


Figure 3. Monthly maximum temperature range

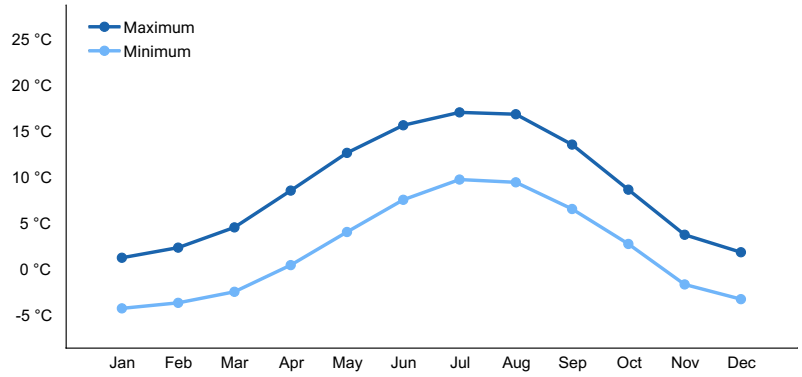


Figure 4. Monthly average minimum and maximum temperature

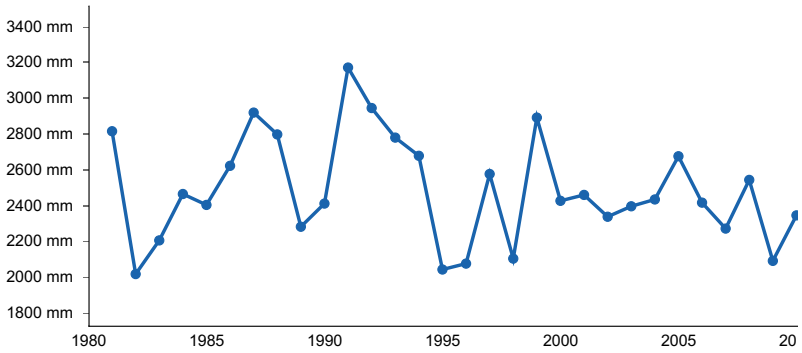


Figure 5. Annual precipitation pattern

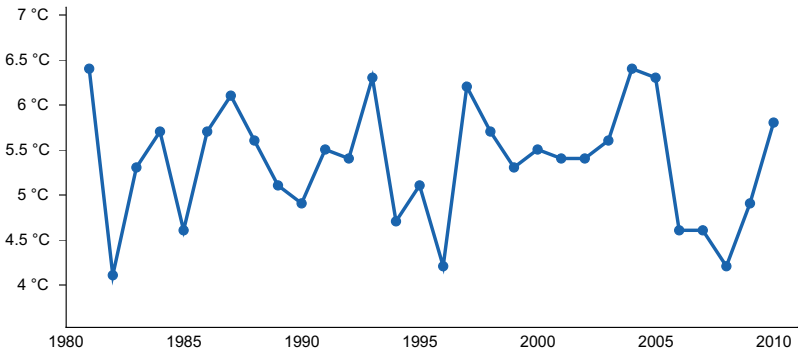


Figure 6. Annual average temperature pattern

Climate stations used

- (1) CORDOVA M K SMITH AP [USW00026410], Cordova, AK
- (2) SITKA AIRPORT [USW00025333], Sitka, AK
- (3) JUNEAU INTL AP [USW00025309], Juneau, AK

- (4) ANNETTE ISLAND AP [USW00025308], Metlakatla, AK
- (5) PETERSBURG 1 [USW00025329], Petersburg, AK
- (6) KETCHIKAN INTL AP [USW00025325], Ketchikan, AK
- (7) PELICAN [USC00507141], Hoonah, AK
- (8) GUSTAVUS [USW00025322], Gustavus, AK
- (9) GLACIER BAY [USC00503294], Gustavus, AK
- (10) YAKUTAT STATE AP [USW00025339], Yakutat, AK
- (11) SKAGWAY AP [USW00025335], Skagway, AK
- (12) HAINES AP [USW00025323], Haines, AK
- (13) SELDOVIA AP [USW00025516], Homer, AK
- (14) MAIN BAY [USC00505604], Valdez, AK

Influencing water features

The hydrology of this site is characterized by saturated soil conditions and a water table just below or several inches above (ponded) the soil surface throughout the growing season. Since it occurs in depressions near the bottom of a watershed, this site accumulates water flowing into it as runoff and subsurface flow from adjacent sites upslope. This site discharges water slowly due to its low slope and concave surface topography.

Soil features

The soils of this site formed in deep, coarse-textured outwash, alluvium, or eolian sand deposits greater than 60 inches thick. These soils are very poorly drained and have an aquic soil moisture regime. Soil textures are typically sandy with very few rock fragments, and may be capped with a mucky peat organic layer or a loamy- to silty-textured mineral layer on the surface. These soils are nutrient poor, with low clay content, low calcium carbonate content, and neutral to moderately acidic pH.

Figure 7. Typical soil profile.

Table 5. Representative soil features

Parent material	(1) Outwash (2) Alluvium (3) Eolian sands
Surface texture	(1) Sandy loam (2) Mucky peat (3) Silt loam (4) Peat (5) Muck
Family particle size	(1) Sandy (2) Loamy (3) Fine-silty (4) Coarse-loamy
Drainage class	Very poorly drained

Permeability class	Moderately rapid to very rapid
Soil depth	152 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	10.16–26.42 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Clay content (0-50.8cm)	0–10%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-25.4cm)	3.5–7.5
Subsurface fragment volume <=3" (0-152.4cm)	0%
Subsurface fragment volume >3" (0-152.4cm)	0%

Table 6. Representative soil features (actual values)

Drainage class	Very poorly drained
Permeability class	Moderately rapid to very rapid
Soil depth	152 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	2.29–27.69 cm
Calcium carbonate equivalent (0-101.6cm)	0–5%
Clay content (0-50.8cm)	0–24%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-25.4cm)	3–8.3
Subsurface fragment volume <=3" (0-152.4cm)	0–18%
Subsurface fragment volume >3" (0-152.4cm)	0%

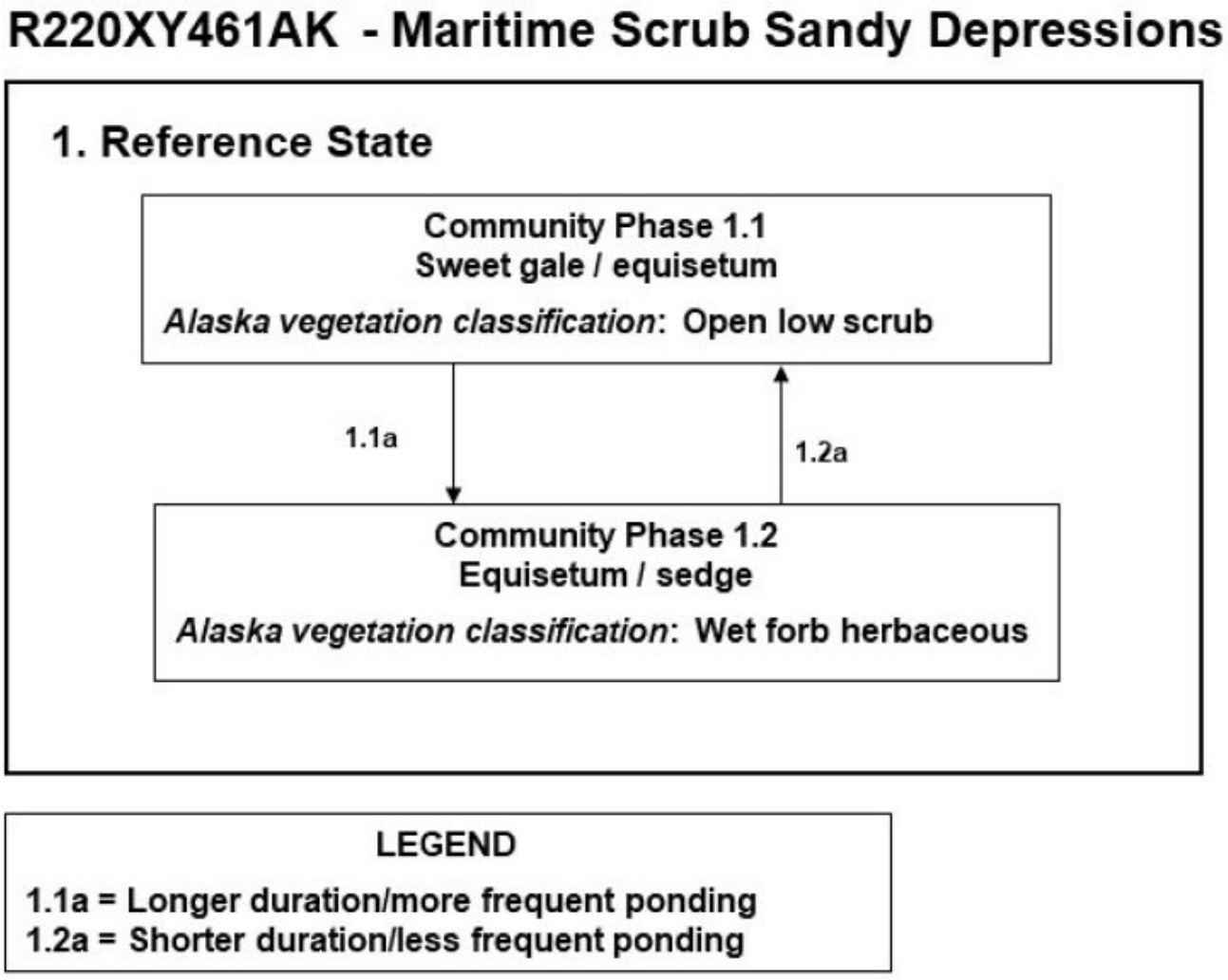
Ecological dynamics

This site occurs in ponded depressions on a variety of landscapes and landforms with coarse-textured soils. Saturated soils and ponding are the primary ecological drivers on this site. Climate trends, weather events, and

hydrologic changes higher up in the watershed all contribute to the ecosystem dynamics observed on this site. The soil is saturated for most of the growing season, often with ponding. As a result, all species common to this site are hydrophytes and are often obligate wetland species. The relative dominance of shrubs is a function of soil wetness and ponding, with sweet gale as the primary indicator of relatively dry hydrology on this site. Micro features resulting from topographic complexity as well as seasonal changes in water inputs may lead to areas within or around depressions that are relatively drier than others.

Browsing by moose on willow species was observed on this ecological site, but it 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 two community phases. The reference community phase is an open low scrubland consisting of low and dwarf shrubs interspersed with areas of water-loving forbs and graminoids. If site wetness increases, the shrub component of the community decreases, particularly sweet gale, and is replaced by a wet forb herbaceous community dominated by horsetails (Equisetum ssp.) and sedges (Carex ssp.).

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

Dominant plant species

- sweetgale (*Myrica gale*), shrub
- sedge (*Carex*), grass
- horsetail (*Equisetum*), other herbaceous

Community 1.1
Sweet gale / equisetum

Figure 8. Typical plant community associated with community 1.1.

The reference community phase is characterized as open scrubland (Viereck et al. 1992) that includes patchy, dense shrubs in a mosaic of wetland graminoids and forbs. Sweetgale is the best indicator of this plant community, along with equisetum species and purple marshlocks. Diverse willows, sedges, and wetland forbs are common. The vegetative strata that characterize this community is medium shrubs (3 feet to 10 feet in height) and medium forbs (4 inches to 2 feet in height). Soil surface cover is a highly variable combination of herbaceous litter, moss, bare soil, and water.

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

- sweetgale (*Myrica gale*), shrub
- horsetail (*Equisetum*), other herbaceous

Table 7. Soil surface cover

Tree basal cover	0%
Shrub/vine/liana basal cover	0%
Grass/grasslike basal cover	0%
Forb basal cover	0%
Non-vascular plants	0-90%
Biological crusts	0%
Litter	40-100%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0-65%
Bare ground	0-45%

Community 1.2
equisetum / sedge

Figure 9. Typical plant community associated with community 1.2.

This is a wet forb herbaceous community (Viereck et al. 1992) with diverse hydrophytic forbs, graminoids, willows, and mosses. Equisetum spp. and Carex spp. are particularly dominant. The vegetative stratum that characterizes this community is medium forbs (4 to 24 inches in height). Soil surface cover is a highly variable combination of herbaceous litter, moss, bare soil, and water.

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

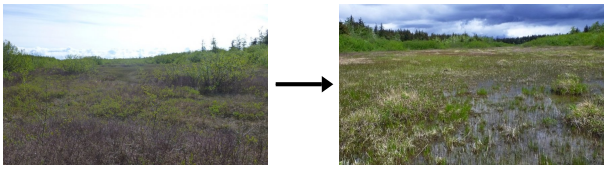
- sedge (*Carex*), grass
- horsetail (*Equisetum*), other herbaceous

Table 8. Soil surface cover

Tree basal cover	0%
Shrub/vine/liana basal cover	0%
Grass/grasslike basal cover	0%

Forb basal cover	0%
Non-vascular plants	0-95%
Biological crusts	0%
Litter	5-80%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	5-90%
Bare ground	0-30%

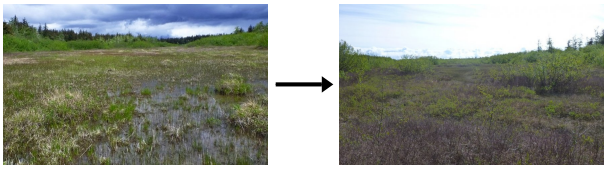
Pathway 1.1a
Community 1.1 to 1.2



Sweet gale / equisetum **equisetum / sedge**

Ecological process: increased ponding reduces bioavailability of soil nutrients due to the lack of oxygen, thereby reducing cover of woody shrubs like sweet gale in favor of sedge and equisetum which are better adapted to extended periods of soil saturation. Trigger: increased wetness due to weather, climate, or hydrologic change in the watershed such as tree removal upslope that reduces evapotranspiration and increases discharge to concave landscape positions.

Pathway 1.2a
Community 1.2 to 1.1



equisetum / sedge **Sweet gale / equisetum**

Ecological process: decreased ponding increases the bioavailability of soil nutrients due to the presence of oxygen, thereby increasing cover of woody shrubs like sweet gale. Trigger: Decreased wetness due to weather, climate, or hydrologic change in the watershed, such as a road that impedes water flow to concave areas due to insufficient culverts.

Additional community tables

Table 9. Community 1.1 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (M)	Canopy Cover (%)
Grass/grass-like (Graminoids)					
Lyngbye's sedge	CALY3	*Carex lyngbyei*	Native	–	0–40
longawn sedge	CAMA11	*Carex macrochaeta*	Native	–	0–20
water sedge	CAAQ	*Carex aquatilis*	Native	–	0–20
bluejoint	CACA4	*Calamagrostis canadensis*	Native	–	0–20
Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	Native	–	0–15

red cottongrass	ERRU2	*Eriophorum russeolum*	Native	–	0–15
sweetgrass	HIOD	*Hierochloe odorata*	Native	–	0–15
tall cottongrass	ERAN6	*Eriophorum angustifolium*	Native	–	0–10
Chamisso's cottongrass	ERCH7	*Eriophorum chamissonis*	Native	–	0–10
tufted hairgrass	DECE	*Deschampsia cespitosa*	Native	–	0–10
falcate rush	JUFA	*Juncus falcatus*	Native	–	0–6
poverty rush	JUTE	*Juncus tenuis*	Native	–	0–5
three-hulled rush	JUTR4	*Juncus triglumis*	Native	–	0–3
red fescue	FERU2	*Festuca rubra*	Native	–	0–3
white cottongrass	ERSC2	*Eriophorum scheuchzeri*	Native	–	0–3
northern green rush	JUALN	*Juncus alpinoarticulatus ssp. nodulosus*	Native	–	0–2
arctic rush	JUAR2	*Juncus arcticus*	Native	–	0–2
common woodrush	LUMU2	*Luzula multiflora*	Native	–	0–2
smallflowered woodrush	LUPA4	*Luzula parviflora*	Native	–	0–2
slimstem reedgrass	CAST36	*Calamagrostis stricta*	Native	–	0–2
little green sedge	CAVI5	*Carex viridula*	Native	–	0–2
boreal bog sedge	CAMA12	*Carex magellanica*	Native	–	0–2
mud sedge	CALI7	*Carex limosa*	Native	–	0–2
tufted bulrush	TRCE3	*Trichophorum cespitosum*	Native	–	0–1
yellow sedge	CAFL4	*Carex flava*	Native	–	0–1
Forb/Herb					
yellow marsh marigold	CAPA5	*Caltha palustris*	Native	–	0–50
buckbean	METR3	*Menyanthes trifoliata*	Native	–	0–25
western water hemlock	CIDO	*Cicuta douglasii*	Native	–	0–15
purple marshlocks	COPA28	*Comarum palustre*	Native	–	1–15
marsh pea	LAPA4	*Lathyrus palustris*	Native	–	0–10
alpine bistort	POVI3	*Polygonum viviparum*	Native	–	0–8
marsh grass of Parnassus	PAPA8	*Parnassia palustris*	Native	–	0–6
smallflower lousewort	PEPA4	*Pedicularis parviflora*	Native	–	0–5
Alaska Indian paintbrush	CAUN4	*Castilleja unalaschcensis*	Native	–	0–5
white marsh marigold	CALE4	*Caltha leptosepala*	Native	–	0–5
giant red Indian paintbrush	CAMI12	*Castilleja miniata*	Native	–	0–5
bog blueberry	VAUL	*Vaccinium uliginosum*	Native	–	0–5
American vetch	VIAM	*Vicia americana*	Native	–	0–4
little yellow rattle	RHMI13	*Rhinanthus minor*	Native	–	0–4
goose tongue	PLMAJ	*Plantago maritima var. juncoides*	Native	–	0–3
kneeling angelica	ANGE2	*Angelica genuflexa*	Native	–	0–3
seacoast angelica	ANLU	*Angelica lucida*	Native	–	0–3
silverweed cinquefoil	ARAN7	*Argentina anserina*	Native	–	0–3
threeleaf goldthread	COTR2	*Coptis trifolia*	Native	–	0–3
violet	VIOLA	*Viola*	Native	–	0–3
Douglas aster	SYSUS	*Symphyotrichum subspicatum var. subspicatum*	Native	–	0–3
sticky tofieldia	TRGL5	*Triantha glutinosa*	Native	–	0–2

sticky tofieldia	TRGL2	*Triantha glutinosa*	Native		0–2
hooded lady's tresses	SPRO	*Spiranthes romanzoffiana*	Native	–	0–2
burnet	SANGU2	*Sanguisorba*	Native	–	0–2
common yarrow	ACMI2	*Achillea millefolium*	Native	–	0–2
beachhead iris	IRSE	*Iris setosa*	Native	–	0–2
threepetal bedstraw	GATR2	*Galium trifidum*	Native	–	0–2
arctic eyebright	EUSU2	*Euphrasia subarctica*	Native	–	0–1
scentbottle	PLDI3	*Platanthera dilatata*	Native	–	0–1
bentgrass	AGROS2	*Agrostis*	Native	–	0–1
showy pussytoes	ANPU	*Antennaria pulcherrima*	Native	–	0–1
roundleaf sundew	DRRO	*Drosera rotundifolia*	Native	–	0–1
Pacific hemlockparsley	COGM	*Conioselinum gmelinii*	Native	–	0–1
Canadian burnet	SACA14	*Sanguisorba canadensis*	Native	–	0–1
felwort	SWPE	*Swertia perennis*	Native	–	0–1
Rocky Mountain goldenrod	SOMU	*Solidago multiradiata*	Native	–	0–1
white clover	TRRE3	*Trifolium repens*	Native	–	0–1
small cranberry	VAOX	*Vaccinium oxycoccos*	Native	–	0–1
Fern/fern ally					
variegated scouringrush	EQVA	*Equisetum variegatum*	Native	–	5–80
water horsetail	EQFL	*Equisetum fluviatile*	Native	–	1–70
field horsetail	EQAR	*Equisetum arvense*	Native	–	0–60
scouringrush horsetail	EQHY	*Equisetum hyemale*	Native	–	0–20
marsh horsetail	EQPA	*Equisetum palustre*	Native	–	0–7
Shrub/Subshrub					
sweetgale	MYGA	*Myrica gale*	Native	–	10–85
undergreen willow	SACO2	*Salix commutata*	Native	–	1–40
Barclay's willow	SABA3	*Salix barclayi*	Native	–	1–15
dune willow	SAHO	*Salix hookeriana*	Native	–	0–10
Sitka willow	SASI2	*Salix sitchensis*	Native	–	0–5
Sitka alder	ALVIS	*Alnus viridis ssp. sinuata*	Native	–	0–5
arctic raspberry	RUAR	*Rubus arcticus*	Native	–	0–3
cloudberry	RUCH	*Rubus chamaemorus*	Native	–	0–3
false mountain willow	SAPS	*Salix pseudomonticola*	Native	–	0–3
grayleaf willow	SAGL	*Salix glauca*	Native	–	0–1
Tree					
Sitka spruce	PISI	*Picea sitchensis*	Native	–	0–7
lodgepole pine	PICO	*Pinus contorta*	Native	–	0–5
Nonvascular					
calliergon moss	CALLI10	*Calliergon*	Native	–	0–95
calliergonella moss	CACU18	*Calliergonella cuspidata*	Native	–	0–70
Moss	2MOSS	*Moss*	Native	–	0–60
goose neck moss	RHYTI2	*Rhytidiadelphus*	Native	–	0–60
dichodontium moss	DIPE7	*Dichodontium pellucidum*	Native	–	0–50
goose neck moss	RHLO70	*Rhytidiadelphus loreus*	Native	–	0–20

rhizomnium moss	RHIZO2	*Rhizomnium*	Native	–	0–15
rhizomnium moss	RHGL70	*Rhizomnium glabrescens*	Native	–	0–10
sphagnum	SPHAG2	*Sphagnum*	Native	–	0–10
felt lichen	PELTI2	*Peltigera*	Native	–	0–1

Table 10. Community 1.2 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (M)	Canopy Cover (%)
Grass/grass-like (Graminoids)					
water sedge	CAAQ	*Carex aquatilis*	Native	–	0–50
Lyngbye's sedge	CALY3	*Carex lyngbyei*	Native	–	0–35
sedge	CAREX	*Carex*	Native	–	0–25
little green sedge	CAVI5	*Carex viridula*	Native	–	0–20
bluejoint	CACA4	*Calamagrostis canadensis*	Native	–	0–20
red cottongrass	ERRU2	*Eriophorum russeolum*	Native	–	0–20
lesser panicled sedge	CADI4	*Carex diandra*	Native	–	0–10
Chamisso's cottongrass	ERCH7	*Eriophorum chamissonis*	Native	–	0–5
rush	JUNCU	*Juncus*	Native	–	0–3
northern green rush	JUALN	*Juncus alpinoarticulatus ssp. nodulosus*	Native	–	0–2
tufted hairgrass	DECE	*Deschampsia cespitosa*	Native	–	0–2
tall cottongrass	ERAN6	*Eriophorum angustifolium*	Native	–	0–1
bentgrass	AGROS2	*Agrostis*	Native	–	0–1
slimstem reedgrass	CAST36	*Calamagrostis stricta*	Native	–	0–1
largehead sedge	CAMA10	*Carex macrocephala*	Native	–	0–1
hairyleaf rush	JUSU3	*Juncus supiniformis*	Native	–	0–1
Forb/Herb					
scouringrush horsetail	EQHY	*Equisetum hyemale*	Native	–	0–65
water horsetail	EQFL	*Equisetum fluviatile*	Native	–	0–40
variegated scouringrush	EQVA	*Equisetum variegatum*	Native	–	0–35
buckbean	METR3	*Menyanthes trifoliata*	Native	–	0–25
marsh horsetail	EQPA	*Equisetum palustre*	Native	–	0–15
field horsetail	EQAR	*Equisetum arvense*	Native	–	0–10
alpine bistort	POVI3	*Polygonum viviparum*	Native	–	0–6
western water hemlock	CIDO	*Cicuta douglasii*	Native	–	0–5
yellow marsh marigold	CAPA5	*Caltha palustris*	Native	–	0–5
white marsh marigold	CALE4	*Caltha leptosepala*	Native	–	0–5
marsh marigold	CALTH	*Caltha*	Native	–	0–5
gentian	GENTI	*Gentiana*	Native	–	0–4
sticky tofieldia	TRGL5	*Triantha glutinosa*	Native	–	0–4
American vetch	VIAM	*Vicia americana*	Native	–	0–3
violet	VIOLA	*Viola*	Native	–	0–3
marsh grass of Parnassus	PAPA8	*Parnassia palustris*	Native	–	0–3
purple marshlocks	COPA28	*Comarum palustre*	Native	–	0–2
onion	ALLIU	*Allium*	Native	–	0–2
kneeling angelica	ANGE2	*Angelica genuflexa*	Native	–	0–2

kneeling angelica	ANGE2	*Angelica genuflexa*	Native		0–2
fireweed	CHAN9	*Chamerion angustifolium*	Native	–	0–1
common yarrow	ACMI2	*Achillea millefolium*	Native	–	0–1
roundleaf sundew	DRRO	*Drosera rotundifolia*	Native	–	0–1
marsh willowherb	EPPA	*Epilobium palustre*	Native	–	0–1
iris	IRIS	*Iris*	Native	–	0–1
threepetal bedstraw	GATR2	*Galium trifidum*	Native	–	0–1
fringed grass of Parnassus	PAFI3	*Parnassia fimbriata*	Native	–	0–1
arctic lupine	LUAR2	*Lupinus arcticus*	Native	–	0–1
starwort	STELL	*Stellaria*	Native	–	0–1
Douglas aster	SYSUS	*Symphyotrichum subspicatum var. subspicatum*	Native	–	0–1
Shrub/Subshrub					
Barclay's willow	SABA3	*Salix barclayi*	Native	–	0–20
Sitka willow	SASI2	*Salix sitchensis*	Native	–	0–20
false mountain willow	SAPS	*Salix pseudomonticola*	Native	–	0–4
dune willow	SAHO	*Salix hookeriana*	Native	–	0–3
sweetgale	MYGA	*Myrica gale*	Native	–	0–3
Sitka alder	ALVIS	*Alnus viridis ssp. sinuata*	Native	–	0–2
arctic raspberry	RUAR	*Rubus arcticus*	Native	–	0–1
undergreen willow	SACO2	*Salix commutata*	Native	–	0–1
squashberry	VIED	*Viburnum edule*	Native	–	0–1
Tree					
lodgepole pine	PICO	*Pinus contorta*	Native	–	0–1
Nonvascular					
scorpidium moss	SCSC70	*Scorpidium scorpioides*	Native	–	0–90
Moss	2MOSS	*Moss*	Native	–	0–50
pohlia moss	POHLI2	*Pohlia*	Native	–	0–40
hookeria moss	HOLU	*Hookeria lucens*	Native	–	0–20
aulacomnium moss	AUPA70	*Aulacomnium palustre*	Native	–	0–15
sphagnum	SPHAG2	*Sphagnum*	Native	–	0–10
goose neck moss	RHYTI2	*Rhytidiadelphus*	Native	–	0–5

Inventory data references

All data currently reside in NASIS under the User Site IDs in the following table:

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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	05/13/2025
Approved by	Marji Patz
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:**

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

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5. **Number of gullies and erosion associated with gullies:**

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

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

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

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

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

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

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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):**

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

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

---

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:**
