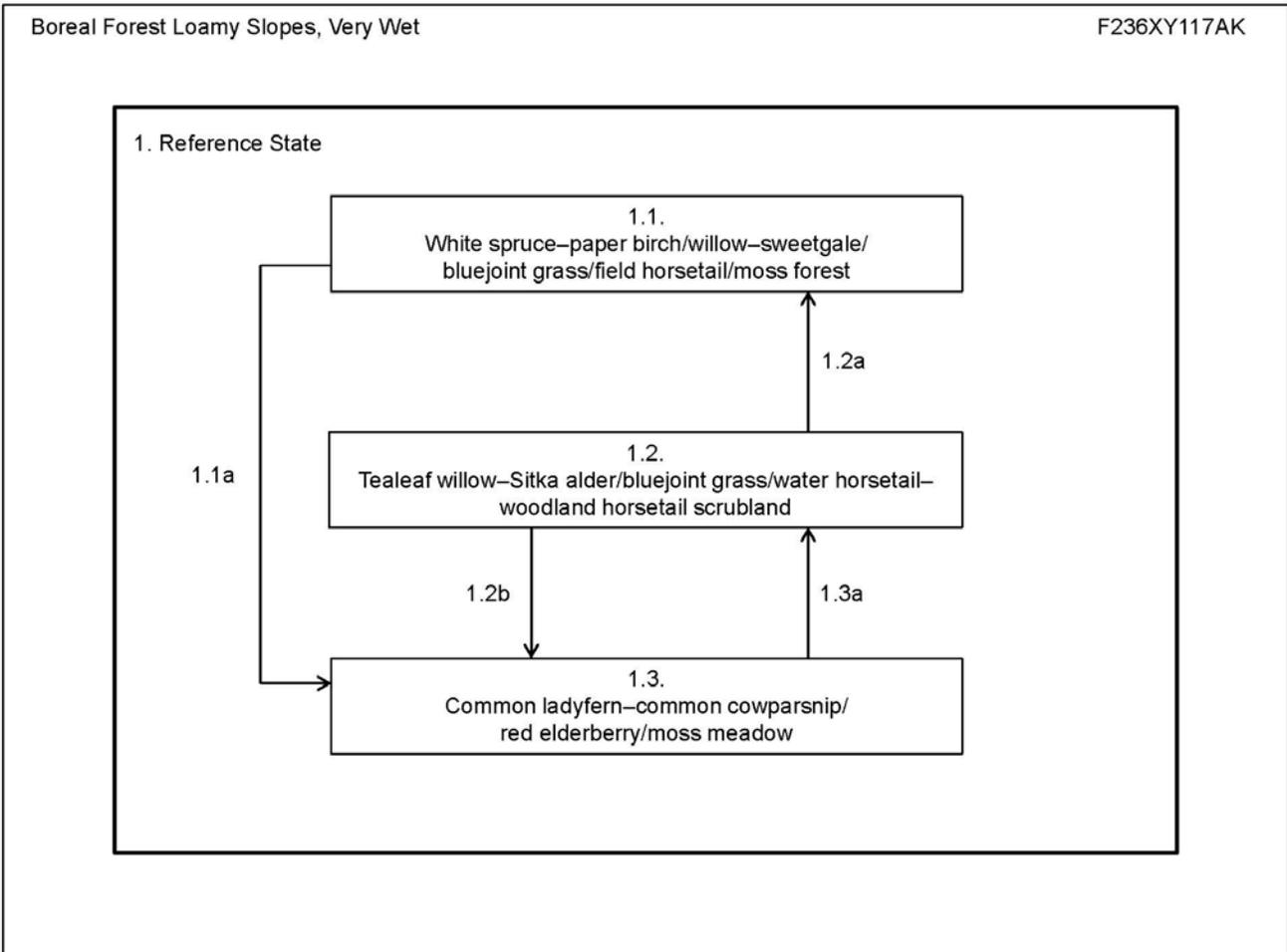


Ecological Site Description ID:	F236XY117AK—Boreal Forest Loamy Slopes, Very Wet
Ecological Dynamics of the Site:	
<p>This boreal ecological site is in linear to concave areas of upland plains and hills. It is typically 33 to 719 feet above sea level with slopes of 4 to 16 percent. Slope aspect does not appear to influence the plant community dynamics of this site because it is on all aspects.</p> <p>This ecological site is correlated to Damcreek soils. Soil characteristics that are likely to influence plant community dynamics include the cryic soil temperature regime, the aquic moisture regime with slow soil permeability to a depth of 40 inches, and a slightly acidic or moderately acidic (pH 6.1 to 5.8) first mineral horizon. Organic material content is commonly 15 to 20 percent in the surface layer. The annual precipitation is 25 to 37 inches, and the annual frost-free period is 85 to 140 days. The parent material is mossy organic material over coarse-silty alluvium over fine-loamy glaciolacustrine deposits.</p> <p>The reference community phase is typified by mixed white spruce (<i>Picea glauca</i>) and paper birch (<i>Betula papyrifera</i>) forest with an understory of forbs, medium shrubs, and abundant moss ground cover. Ecological site F236XY116AK (Boreal Forest Loamy Slopes, Wet) is in linear to convex areas of boreal upland plains and hills, and this site (F236XY117AK) is in linear to concave drainageways of the plains and hills. These sites differ in soil permeability, soil moisture subclass, surface layer pH, drainage class, and runoff potential. These differences and the resulting dissimilarities in disturbance regimes, reference states, and community phases make use of separate ecological sites necessary.</p> <p>Subsurface seepage is the main documented disturbance regime for this ecological site, and it is considered to be a natural event that is typically unmanaged. The soils in the sloped, linear to concave areas are somewhat poorly drained and have a high runoff potential. They are subject to very rare periods of flooding during the peak period of snowmelt in April and May. A water table is at a depth of 16 to 24 inches year round. The available background information suggests seepage or ponding commonly inhibits access of oxygen by susceptible plants (Hook and Crawford, 1978; Jackson and others, 1991). The hypoxic or anoxic condition that may result is a major abiotic stress that helps to determine the presence or absence of vascular plants (Vartapetian and Jackson, 1996). The time period necessary for changes in vegetation to occur due to seepage is unknown. Because flooding occurs very rarely, seepage is dependent on precipitation, runoff, and snowmelt; therefore, its effects are expected to be conditional upon yearly and monthly variations in precipitation and snowmelt.</p> <p>Slight browsing by moose on non-willow shrubs is also possible on this site, but it does not appear to affect the ecological processes significantly enough to alter the communities.</p>	

State and Transition Diagram:



LEGEND  
 1.1a = Seepage  
 1.2a, 1.3a = Seepage recovery

<b>State ID Number:</b>	1	<b>State Name:</b>	Reference State
<b>State Narrative:</b>	<p>The reference state supports three community phases, grouped by structure and dominance of the vegetation (e.g., trees, shrubs, graminoids, and forbs) and their ecological function and stability. The presence of the communities is temporally dictated by a seepage regime associated with these linear to concave areas. The reference community phase is represented by mixed forest with an understory of generally hydrophilic shrubs and forbs. No alternative states have been observed.</p> <p>This report provides baseline vegetation inventory data for this site. Future data collection is needed to provide further information about existing plant communities and the disturbance regimes that would result in transitions from one community to another.</p>		

Phase 1.1			
Community Phase Number:	1.1	Community Phase Name:	White spruce-paper birch/willow-sweetgale/bluejoint grass/field horsetail/moss forest
Community Phase Narrative:			
<p>The reference community phase for this ecological site is characterized by open forest consisting of mixed deciduous and coniferous trees with an understory of dominantly hydrophilic shrubs, forbs, and graminoids. Annual plant production is visually estimated to be highest among trees, though shrub and forb production is also expected to be relatively high. Typically, the overstory is paper birch (<i>Betula papyrifera</i>) and white spruce (<i>Picea glauca</i>) and the understory is facultative to obligate wetland species, including tealeaf willow (<i>Salix pulchra</i>), sweetgale (<i>Myrica gale</i>), field horsetail (<i>Equisetum arvense</i>), and bluejoint grass (<i>Calamagrostis canadensis</i>). Other understory species may include Lapland cornel (<i>Cornus suecica</i>), strawberryleaf raspberry (<i>Rubus pedatus</i>), Canadian burnet (<i>Sanguisorba canadensis</i>), longawn sedge (<i>Carex macrochaeta</i>), and others. Mosses, including feathermosses (<i>Ptilium crista-castrensis</i>, <i>Hylocomium splendens</i>) and sphagnum mosses (<i>Sphagnum spp.</i>), generally make up a large percentage of the ground cover (total mean cover ~85 percent). Other ground cover commonly includes herbaceous litter (~15 percent) and woody litter (~10 percent).</p>			

Community Phase Canopy Cover

(Vegetation data in the table are provided as constancy (percent) and average canopy cover (percent) of the most dominant and ecologically relevant species for this community phase.)

Plant group	Common name	Scientific name	USDA plant code	Constancy (percent)	Average canopy cover (percent)
T	Paper birch	<i>Betula papyrifera</i>	BEPA	200.0*	12.0^
T	White spruce	<i>Picea glauca</i>	PIGL	100.0	25.0^
S	Tealeaf willow	<i>Salix pulchra</i>	SAPU15	100.0	15.0
S	Sweetgale	<i>Myrica gale</i>	MYGA	100.0	10.0
G	Bluejoint grass	<i>Calamagrostis canadensis</i>	CACA4	100.0	10.0
F	Field horsetail	<i>Equisetum arvense</i>	EQAR	100.0	60.0
M	Feathermosses	Includes 2 genera		100.0, 100.0#	15.0, 35.0

\* Trees may be present in multiple strata within one plot; therefore, it is possible for species of this plant group to have a constancy value of more than 100 percent.

^ Tall, medium, and stunted individuals are counted as canopy trees. Regenerative individuals are not included.

# Feathermosses are represented by two species here—*Hylocomium splendens* and *Ptilium crista-castrensis*, respectively.

Note: The vegetation and soils for this community were sampled at one location. Due to the limited data about this community phase, personal field observations were used to aid in describing this plant community.

Community Pathways

Pathway Number	Pathway Name & Description
1.1a	Seepage. It is likely that seepage will drown susceptible plant species of the reference community phase, particularly trees and shrubs. Less competition for space and light, however, could allow for pioneer, hydrophilic forbs and graminoids to colonize. The frequency and duration of seepage required to initiate this transition is unknown.

Phase 1.2			
Community Phase Number:	1.2	Community Phase Name:	Tealeaf willow-Sitka alder/bluejoint grass/water horsetail-woodland horsetail scrubland
Community Phase Narrative:			
<p>This is the late seepage community phase, characterized by scrubland with water-tolerant graminoids and forbs. Annual plant production is visually estimated to occur at moderately equal levels in the shrub and graminoid groups, with forbs also contributing to annual production. Total plant production is hypothesized to be less than that of the reference community phase due to the poorer growing conditions and lack of trees. Typically, this community consists of tealeaf willow (<i>Salix pulchra</i>) and Sitka alder (<i>Alnus viridis ssp. sinuata</i>) scrubland with areas of bluejoint grass (<i>Calamagrostis canadensis</i>) and water-tolerant forbs such as horsetails (<i>Equisetum spp.</i>), violets (<i>Viola spp.</i>), and ferns. Other species that may be present include Barclay's willow (<i>Salix barclayi</i>), cloudberry (<i>Rubus chamaemorus</i>), strawberryleaf raspberry (<i>Rubus pedatus</i>), and tall Jacob's-ladder (<i>Polemonium acutiflorum</i>). Medium and regenerative trees such as white spruce (<i>Picea glauca</i>) and Kenai birch (<i>Betula papyrifera var. kenaica</i>) may be present sporadically in this community. Sphagnum mosses (<i>Sphagnum spp.</i>) are generally in the ground cover (total mean cover ~13 percent). Other ground cover commonly includes herbaceous litter (~83 percent) and woody litter (~6 percent).</p>			

Community Phase Canopy Cover

(Vegetation data in the table are provided as constancy (percent) and average canopy cover (percent) of the most dominant and ecologically relevant species for this community phase.)

Plant group	Common name	Scientific name	USDA plant code	Constancy (percent)	Average canopy cover (percent)
S	Tealeaf willow	<i>Salix pulchra</i>	SAPU15	100.0	10.0
S	Sitka alder	<i>Alnus viridis ssp. sinuata</i>	ALVIS	50.0	40.0
G	Bluejoint grass	<i>Calamagrostis canadensis</i>	CACA4	100.0	52.5
F	Violets	<i>Viola spp.</i>	VIOLA	100.0	Trace
F	Water horsetail	<i>Equisetum fluviatile</i>	EQFL	50.0	10.0

Note: The vegetation and soils for this community were sampled at two separate locations. Due to the limited data about this community phase, personal field observations were used to aid in describing this plant community.

Community Pathways

Pathway Number	Pathway Name & Description
1.2a	<p>Natural succession: Normal time and growth without disruptive seepage.</p> <p>It is probable that as time passes, trees such as white spruce and paper birch may colonize and reproduce, eventually dominating the overstory. This can shade out larger shrubs, allowing competitive forbs, graminoids, and smaller shrubs to colonize. The time needed for this transition to occur is currently unknown; however, various factors may be influential, including the rate of decrease in soil moisture and the colonization and growth rate of trees.</p>
1.2b	<p>Extended period of seepage.</p> <p>It is likely that extended periods of subsurface water saturation and movement may create a hypoxic or anoxic condition that can drown susceptible plants in community 1.2. This would allow more water-tolerant species to colonize. The time required for this transition to take place is unknown, but it is estimated to be long because many of the plants in the late community phase are facultative to obligate wetland species.</p>

Phase 1.3			
Community Phase Number:	1.3	Community Phase Name:	Common ladyfern-common cowparsnip/red elderberry/moss meadow
Community Phase Narrative:			
<p>This is the early seepage community phase, characterized by forb meadow with shrubs and graminoids primarily at the edges. A majority of the annual plant production is visually estimated to be among forbs, and shrub production is next highest. Typically, this community consists of dense meadow consisting of common ladyfern (<i>Athyrium filix-femina</i>), common cowparsnip (<i>Heracleum maximum</i>), and fireweed (<i>Chamerion angustifolium</i>) and patches of red elderberry (<i>Sambucus racemosa</i>) and bluejoint grass (<i>Calamagrostis canadensis</i>) at the edges. Various other forbs include seacoast angelica (<i>Angelica lucida</i>), field horsetail (<i>Equisetum arvense</i>), Bering chickweed (<i>Cerastium beeringianum</i>), and larkspurleaf monkshood (<i>Aconitum delphiniifolium</i>). The ground cover consists dominantly of mosses (total mean cover ~40 percent) and herbaceous litter (~80 percent)</p>			

Community Phase Canopy Cover

(Vegetation data in the table are provided as constancy (percent) and average canopy cover (percent) of the most dominant and ecologically relevant species for this community phase.)

Plant group	Common name	Scientific name	USDA plant code	Constancy (percent)	Average canopy cover (percent)
S	Red elderberry	<i>Sambucus racemosa</i>	SARA2	100.0	30
F	Common ladyfern	<i>Athyrium filix-femina</i>	ATFI	100.0	50
F	Common cowparsnip	<i>Heracleum maximum</i>	HEMA80	100.0	40
F	Fireweed	<i>Chamerion angustifolium</i>	CHAN9	100.0	5

Note: The vegetation and soils for this plant community phase were sampled at one location. Due to the limited data about this community phase, personal field observations were used to aid in describing this plant community.

Community Pathways

Pathway Number	Pathway Name & Description
1.3a	<p>Natural succession: Normal time and growth without disruptive seepage.</p> <p>It is likely that as time passes, decreases in soil moisture may allow medium and tall shrubs to colonize. The overshadowing caused by these shrubs can reshape the understory, commonly leading to a dominance of shade- and moisture-tolerant forbs and graminoids. The time necessary for this to occur is unknown, though it is hypothesized that hydrophilic shrubs may begin to colonize very soon after a major seepage event.</p>

Bibliography

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*This report is interim and subject to change.*