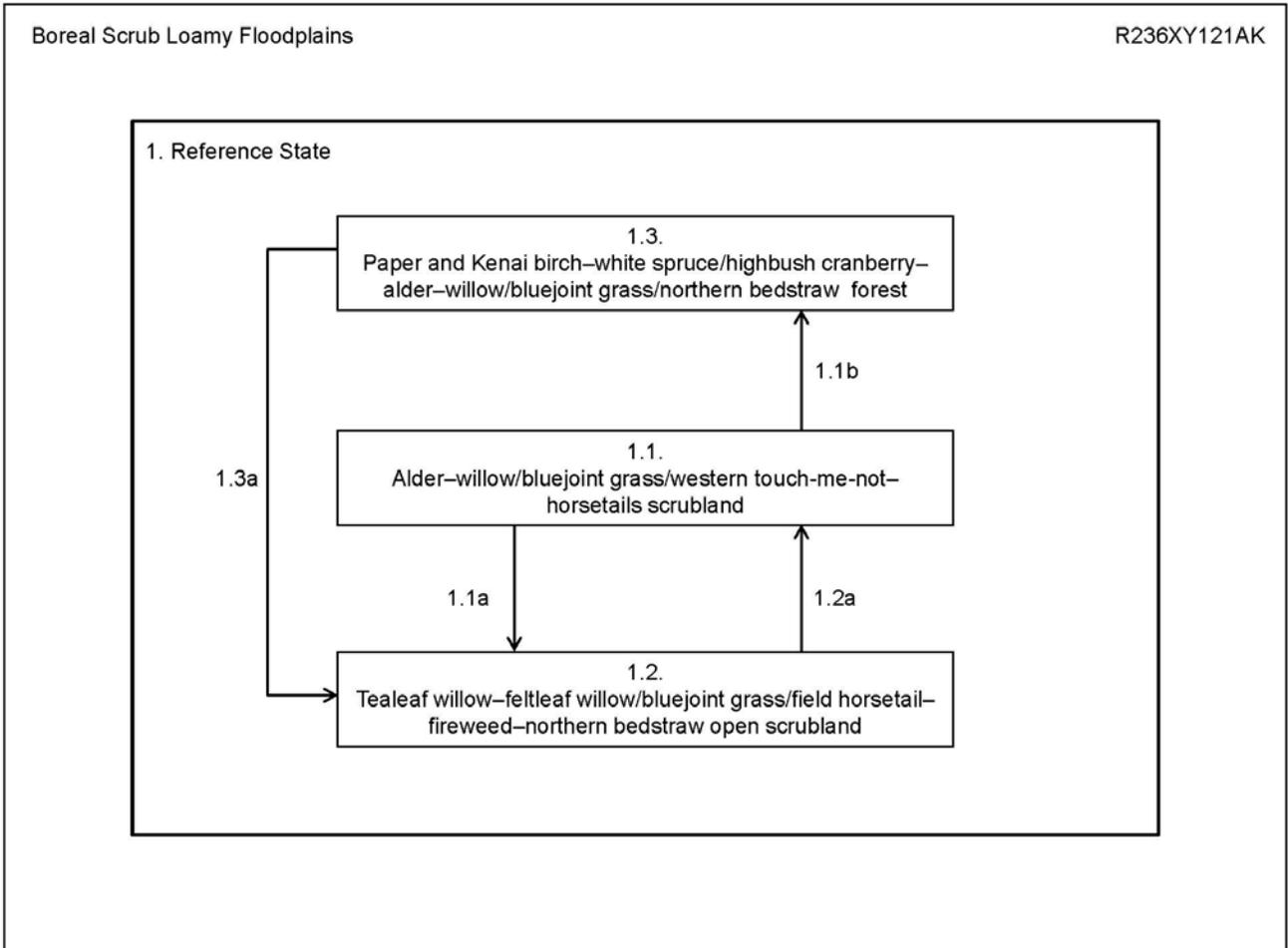


Ecological Site Description ID:	R236XY121AK—Boreal Scrub Loamy Flood Plains
Ecological Dynamics of the Site:	
<p>This boreal ecological site is located on lowland mid flood plains that are not in a channel. These areas are typically found at elevations between sea level and 1,820 feet with slopes of 0 to 4 percent. Slope aspect does not appear to influence the plant community dynamics of this site as it is found on all aspects.</p> <p>This ecological site is correlated to D36-Boreal scrub loamy flood plains and Lewispoint soils. Soil characteristics that are likely to influence plant community dynamics include a cryic soil temperature regime, an udic moisture regime with slow soil permeability to a depth of 40 inches, and a moderately acidic to very strongly acidic (pH 5.6 to 4.6) first mineral horizon. These soils are moderately well to well drained with low to medium runoff potential. Organic material content is commonly 1 to 7 percent in the surface layer. Annual precipitation is normally between 24 and 77 inches, and the annual frost-free period ranges from 80 to 140 days. Parent material consists of coarse-loamy alluvium, or grassy organic material over coarse-loamy alluvium over sandy and gravelly alluvium.</p> <p>The reference community phase is typified by tall shrub scrubland with an understory of bluejoint grass (<i>Calamagrostis canadensis</i>) and very diverse forbs. When compared to other ecological sites on lowland mid flood plains in the survey area, including R236XY119AK (Boreal Herbaceous Loamy Flood Plains), R236XY120AK (Boreal Scrub Loamy Flood Plains, Open), and R236XY158AK (Boreal Scrub Loamy Flood Plains, Moist), this ecological site is in areas of moderately well to well drained soils. Differences between these ecological sites in landform and river proximity also influence the frequency, duration, and strength of flooding and post-flood ponding. Differences in the soils and disturbance regimes create distinct reference states and community phases, making the use of unique ecological sites necessary.</p> <p>Flooding is the documented disturbance regime for this ecological site. It is considered to be a natural event that is typically unmanaged. The generally low elevation, minimal slope, and proximity to a river tributary make this ecological site susceptible to occasional, brief periods of flooding from April through October. The available background information suggests that the intensity of flooding and time between periods of flooding play a critical role in the distribution and abundance of vegetation in Alaskan riverine systems (Wohl, 2007). This disturbance can allow for plant succession by creating barren and moist colonization spots, burying organic layers, adding nutrients to the soil, and depositing seed banks (Rood <i>et al.</i>, 2007; Yarie <i>et al.</i>, 1998). In addition to flooding, the lower relative position of this ecological site as compared to the surrounding landscape can result in rare or occasional, brief periods of ponding from April through June. Ponding may affect the plant community composition because the hypoxic or anoxic conditions that can result from ponding are a major abiotic stress that helps to determine the presence or absence of vascular plants (Vartapetian and Jackson, 1996). The effects of ponding typically depend not only on the periods of flooding but also on yearly and monthly variations in rainfall, snowmelt, and seepage.</p> <p>Flooding results in one early community phase. Rarely, areas of the reference community phase are not flooded and trees such as paper birch (<i>Betula papyrifera</i>), Kenai birch (<i>Betula papyrifera</i> var. <i>kenaica</i>), and white spruce (<i>Picea glauca</i>) may colonize and create a forest community. Reintroduction of a flooding regime to the post-reference community phase is expected to cause a transition to the early flooding community phase.</p> <p>Slight to severe browsing of willow by moose has been noted in the reference community phase. This browsing may regulate the growth and reproduction of willow, but it does not create a significant change in structure and function.</p>	

State and Transition Diagram:



LEGEND
 1.1a, 1.3a = Flooding
 1.2a = Flooding recovery
 1.1b = No flooding

State ID Number:	1	State Name:	Reference State
State Narrative:	<p>The reference state supports three community phases, grouped by the structure and dominance of the vegetation (e.g., trees, shrubs, forbs, and graminoids) and their ecological function and stability. The presence of these communities is temporally dictated by occasional flooding. The reference community phase is represented by scrubland consisting of tall shrubs with an understory of graminoids and forbs. A transition to a post-reference community phase is possible when the reference community phase is not flooded for a longer than normal period of time, thereby allowing for colonization and growth of trees. No alternative states have been observed.</p> <p>This report provides baseline vegetation inventory data for this ecological 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:	Alder-willow/bluejoint grass/western touch-me-not-horsetails scrubland
Community Phase Narrative:			
<p>The reference community phase is characterized by tall scrubland with forbs and graminoids dispersed throughout. Annual plant production is visually estimated to be highest among shrubs and is lower, but relatively equal, among graminoids and forbs. Typically, this community consists of a tall shrub overstory of Sitka alder (<i>Alnus viridis</i> ssp. <i>sinuata</i>), thin-leaf alder (<i>Alnus incana</i> ssp. <i>tenuifolia</i>), and feltleaf willow (<i>Salix alaxensis</i>) with an understory of bluejoint grass (<i>Calamagrostis canadensis</i>), western touch-me-not (<i>Impatiens noli-tangere</i>), spreading woodfern (<i>Dryopteris expansa</i>), and horsetails (<i>Equisetum</i> spp.). Other extant species may include tealeaf willow (<i>Salix pulchra</i>), American red raspberry (<i>Rubus idaeus</i>), arctic starflower (<i>Trientalis europaea</i>), and fireweed (<i>Chamerion angustifolium</i>). The ground cover commonly includes mosses (total mean cover ~11 percent), herbaceous litter (~82 percent cover), and woody litter (~8 percent). About 10 percent is bare soil.</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	Thinleaf alder	<i>Alnus incana ssp. tenuifolia</i>	ALINT	68.2	42.3
S	American red raspberry	<i>Rubus idaeus</i>	RUID	63.6	8.9
S	Feltleaf willow	<i>Salix alaxensis</i>	SAAL	59.1	14.5
S	Sitka alder	<i>Alnus viridis ssp. sinuata</i>	ALVIS	54.6	39.5
S	Tealeaf willow	<i>Salix pulchra</i>	SAPU15	50.0	5.1
G	Bluejoint grass	<i>Calamagrostis canadensis</i>	CACA4	95.5	54.8
F	Spreading woodfern	<i>Dryopteris expansa</i>	DREX2	77.3	6.9
F	Western touch-me-not	<i>Impatiens noli-tangere</i>	IMNO	72.7	11.0
F	Horsetails	<i>Equisetum spp.</i>	EQUIS	63.6, 31.8, 31.8 [^]	12.6, 21.7, 26.4

[^] Horsetails (*Equisetum spp.*) are represented by three species—*E. arvense*, *E. pratense*, and *E. sylvaticum*, respectively.

Community Pathways

Pathway Number	Pathway Name & Description
1.1a	<p>Flooding.</p> <p>Flooding can inundate this community, scouring loose-rooted vegetation and soil and depositing sediment and a new seed bank. It does not appear to be detrimental to all vegetation, as some shrubs typically survive this disturbance. In areas where competition for light and space has diminished, pioneer (disturbance-loving) hydrophilic forbs and graminoids, particularly species that have seeds or spores that are dispersed by wind or water, are likely to be recruited. Occasional, brief periods of flooding occur; however, the specific frequency and duration required to initiate a community transition is currently unknown. Ponding in these low areas may limit plant recruitment to only those species that can survive in moist environs.</p>
1.1b	<p>Rare, prolonged periods without flooding.</p> <p>When the reference community phase is not flooded for a long period of time, it may be possible for slower-growing, less hydrophilic species such as trees to colonize. This transition is thought to be very rare because flooding commonly is regular enough to prevent trees from maturing and reproducing. This ecological site is expected to remain in community phase 1.1 for a long period of time before progressing to community phase 1.3 because of the intense competition from shrubs and the continued influence of ponding in summer, which can restrict the ability of trees to colonize, grow, and reproduce.</p>

Phase 1.2			
Community Phase Number:	1.2	Community Phase Name:	Tealeaf willow-feltleaf willow/bluejoint grass/field horsetail-fireweed-northern bedstraw open scrubland
Community Phase Narrative:			
<p>This early flooding community phase is characterized by willow (<i>Salix spp.</i>) scrubland with bluejoint grass (<i>Calamagrostis canadensis</i>) and forbs throughout. Annual plant production is visually estimated to be higher in the combined graminoid and forb groups than in the shrub group. Typically, this community consists of a patchwork community of tealeaf willow (<i>Salix pulchra</i>) and feltleaf willow (<i>Salix alaxensis</i>) with open areas of bluejoint grass, fireweed (<i>Chamerion angustifolium</i>), northern bedstraw (<i>Galium boreale</i>), and field horsetail (<i>Equisetum arvense</i>). Other species may include alders (<i>Alnus spp.</i>), Barclay's willow (<i>Salix barclayi</i>), western touch-me-not (<i>Impatiens noli-tangere</i>), common ladyfern (<i>Athyrium filix-femina</i>), other horsetails (<i>Equisetum spp.</i>), and others. Mosses are a relatively minor vegetative component (total mean cover ~8 percent). Other ground cover commonly includes herbaceous litter (~80 percent) and woody litter (~5 percent). About 24 percent is bare soil.</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	90.0	24.6
S	Feltleaf willow	<i>Salix alaxensis</i>	SAAL	40.0	48.3
G	Bluejoint grass	<i>Calamagrostis canadensis</i>	CACA4	100.0	56.5
F	Fireweed	<i>Chamerion angustifolium</i>	CHAN9	80.0	8.4
F	Northern bedstraw	<i>Galium boreale</i>	GABO2	70.0	2.4
F	Field horsetail	<i>Equisetum arvense</i>	EQAR	60.0	19.3

Community Pathways

Pathway Number	Pathway Name & Description
1.2a	<p>Natural succession: Normal time and growth without disruptive flooding.</p> <p>It is likely that as time passes, medium and tall alders and willows will reproduce, creating a more shaded understory. Graminoid and forb populations may diversify as new niches are created within the community. The time necessary for this transition to take place is currently unknown, though it is likely that it is affected by factors such as the reproductive rate of willows and alders, distance from a seed source, and variations in precipitation.</p>
Phase 1.3	

Community Phase Number:	1.3	Community Phase Name:	Paper and Kenai birch-white spruce/highbush cranberry-alder-willow/bluejoint grass/northern bedstraw forest
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Community Phase Narrative:

This post-reference community phase is characterized by mixed forest with an understory of bluejoint grass, various forbs, and patches of shrubs. Annual plant productivity is visually estimated to be highest in the tree group. Production among graminoids, forbs, and shrubs fluctuates, but in some cases can be nearly as high as that of trees. Total plant productivity is hypothesized to be higher than in the reference community phase due to the increased biomass of the trees. Typically, this community consists of a mixed overstory of paper birch (*Betula papyrifera*), Kenai birch (*Betula papyrifera* var. *kenaica*), and white spruce (*Picea glauca*) with an understory of alder (*Alnus* spp.), willow (*Salix* spp.), bluejoint grass (*Calamagrostis canadensis*),ighbush cranberry (*Viburnum edule*), northern bedstraw (*Galium boreale*), and arctic starflower (*Trientalis europaea*). Myriad other understory plants may also be present, including arctic raspberry (*Rubus arcticus*), alders (*Alnus* spp.), tealeaf willow (*Salix pulchra*), Lapland cornel (*Cornus suecica*), field horsetail (*Equisetum arvense*), and spreading woodfern (*Dryopteris expansa*). Mosses commonly are a minor component of this community (total mean cover ~5 percent). Other ground cover includes herbaceous litter (~95 percent) and woody litter.

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	White spruce	<i>Picea glauca</i>	PIGL	100.0	10.0^
T	Paper birch	<i>Betula papyrifera</i>	BEPA	50.0	30.0^
T	Kenai birch	<i>Betula papyrifera</i> var. <i>kenaica</i>	BEPAK	50.0	35.0^
S	Highbush cranberry	<i>Viburnum edule</i>	VIED	100.0	7.5
G	Bluejoint grass	<i>Calamagrostis canadensis</i>	CACA4	100.0	45.0
F	Northern bedstraw	<i>Galium boreale</i>	GABO2	100.0	16.5
F	Arctic starflower	<i>Trientalis europaea</i>	TREU	100.0	2.6
F	Fireweed	<i>Chamerion angustifolium</i>	CHAN9	100.0	1.1

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

Note: The vegetation and soils for this community were sampled at two locations. Due to the limited data available for 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>Flooding.</p> <p>The return of a flooding regime to the post-reference community phase can result in the uprooting or drowning of extant tree and shrub species. Free from competition for light and space, fast-growing, hydrophilic, pioneer graminoids and forbs may colonize and thrive. The time needed for this transition to occur is unknown, but it is first contingent on the return of the occasional, brief periods of flooding, which is the natural flooding regime.</p>

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This report is interim and subject to change.