

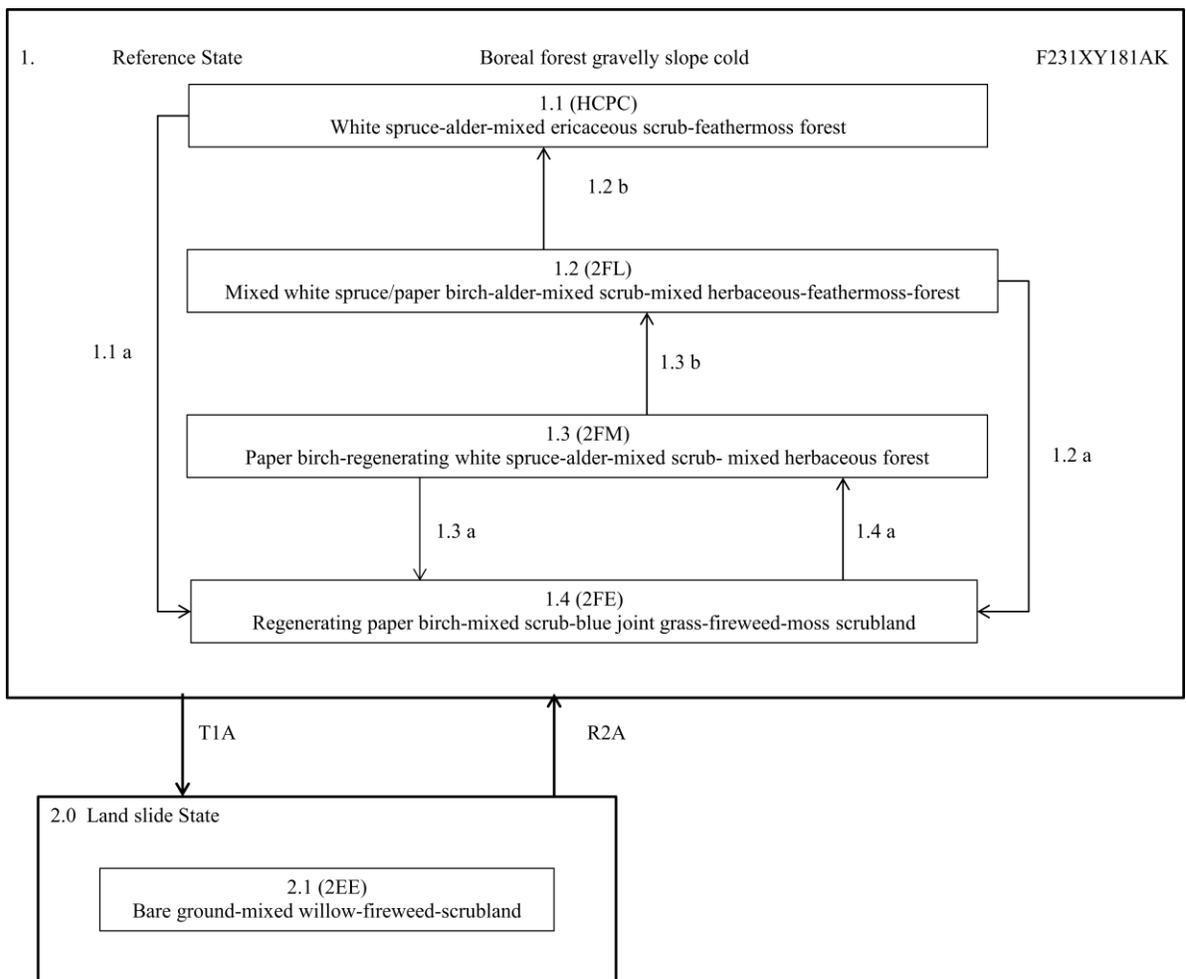
Ecological Site Description ID: F231XY181AK

Ecological Dynamics of the Site:

This boreal ecological site occurred on steep north facing escarpment slopes (i.e. typical slope exceeded 65%). The north facing aspect for this ecological site resulted in a cooler microclimate when compared to ecological sites on steep southern escarpment slopes (i.e. R231XY109AK and F231XY110AK). However, the steep slopes and gravelly soils on this ecosite prevented development of permafrost. Site conditions favored development of an open white spruce forest. While F231XY110AK was similar ecological site, F231XY181AK had a thick organic mat and abundant moss ground cover. For community phase 1.1, soils were classified as cryorthents and were composed of organic matter over gravelly colluvium.

Fire was a disturbance regime that resulted in 4 documented phases. Fire is a natural and typically unmanaged disturbance regime. The typical fire return interval for coniferous forests of interior Alaska is approximately 100 years. Mass movement due to fire disturbance resulted in one observed alternate state that had one documented phase.

State and Transition Diagram:



State ID Number:	1	State Name:	Reference
State Narrative:	<p>Phases within the reference state were grouped on the structure and dominance of deciduous and coniferous trees which was believed to directly relate to time since last fire event.</p> <p>Due to the steepness and dominance of a white spruce forest, a high-severity fire regime was considered to be the typical fire disturbance for this ecological site. In a high-severity fire, large proportions of the organic mat are consumed and mineral soils will typically be exposed. While many pre-fire species likely regenerate after fire, conditions are suitable for the establishment and growth of species with wind-blown seed (e.g. paper birch, fireweed, willow).</p> <p>The fire return interval plays a large role in the structure of the observed forest. Longer fire return intervals favors development of community phases 1.1, while shorter fire return intervals favor development of community phases 1.2 and 1.3.</p> <p>Tall trees are defined as trees growing >40' in height, medium trees are defined as growing 15-40' in height, while stunted and regenerative trees are defined as growing less than 15' in height. Tall shrubs are defined to grow greater than 10' in height, medium shrubs are defined to grow 3-10' in height, low shrubs are defined to grow 8" – 3' in height, and dwarf shrubs are defined to grow less than 8" in height.</p>		

Photo 1.1



Community Phase Number:

1.1

Community Phase Name:

White spruce-alder-mixed ericaceous scrub-feathermoss forest

Community Phase Narrative:

The dominant vegetation was tall trees, low shrubs, and moss. The majority of the tree canopy was split between tall and medium sized trees. While *Picea glauca* was the most common tree species (~30% cover), *Picea mariana* and *Betula neoalaskana* were also observed. For this phase, *Picea glauca* averaged 101 years of age (i.e. ranging from 24-128). Tall, low, and dwarf shrubs were common (combining for ~30% cover). The most common tall shrub was *Alnus viridis*, the most common low shrubs were *Ledum palustre* and *Juniperus communis*, and the most common dwarf shrub was *Vaccinium vitis-idaea*. A common graminoid was *Calamagrostis purpurascens*, while a common forb was *Geocaulon lividum*. *Hylocomium splendens* was an abundant ground cover. This phase had three observations.

Community Pathways

Pathway Number

Pathway Name & Description

1.1a	Fire. For this community phase, white spruce was the dominate tree species. For this ecological site, this phase had the longest fire return interval.
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Photo 1.2



Community Phase Number:	1.2	Community Phase Name:	Mixed white spruce/paper birch-alder-mixed scrub-mixed herbaceous-feathermoss-forest
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Community Phase Narrative:

The dominant vegetation for this phase was medium trees, tall shrubs, low shrubs, and moss. Both *Betula neolaskana* and *Picea glauca* occurred evenly across the tall, medium, and regenerative tree stratum. *Picea glauca* averaged 143 years of age (ranging from 118-159) with an average dbh of 7.0". The most common tall shrub was *Alnus viridis*. The most common low shrubs were *Rosa acicularis*, *Ribes triste*, and *Ledum palustre*. The most common dwarf shrub was *Vaccinium vitis-idaea*. Forb and graminoids combined for approximately 40% cover. A common graminoid was *Calamagrostis canadensis*, while common forbs were *Polygonum alpinum* and *Geocaulon lividum*. Feathermoss was an abundant ground cover. This phase had two observations.

Community Pathways	
Pathway Number	Pathway Name & Description

1.2 a	Fire. For this phase, white spruce and paper birch were codominate trees.
1.2 b	Normal time and growth without fire. As a result, paper birch will eventually be replaced by white spruce that would result in a community assemblage resembling phase 1.1. The fire return interval was presumed to be shorter than phase 1.1 but longer than phase 1.3.

Photo 1.3



Community Phase Number:

1.3

Community Phase Name:

Paper birch-alder-mixed scrub- mixed herbaceous forest

Community Phase Narrative:

The dominant vegetation for this phase was tall trees, medium trees, and scrubs. The most common tall and medium tree species was *Betula nealaskana* (i.e. ~50% cover). *Picea glauca* was an abundant regenerating tree species (~10% cover). Scrubs were abundant covering ~50% of sampled plots. The most common tall scrub was *Alnus viridis*, the most common medium shrub was *Spiraea stevenii*, the most common low scrub was *Viburnum edule*, and the most common dwarf scrub was *Vaccinium vitis-idaea*. The most common graminoid was *Calamagrostis canadensis*, while the most common forb was *Equisetum pratense*. High litter cover (80% cover in sampled plots) likely prevented abundant moss ground cover. This phase had two observations.

Community Pathways

Pathway Number	Pathway Name & Description
1.3 a	Fire. Stands of paper birch are less likely to burn and fire is less likely to spread when compared to stands dominated by spruce. Regardless, stands of paper birch were observed to burn within the study area. If phase 1.3 burned, the resulting community would likely resemble phase 1.4.
1.3 b	Normal time and growth without fire. White spruce will grow and become a codominate with paper birch, which would result in a community resembling phase 1.2. Fire return interval was presumed to be shorter than phase 1.2 but longer than phase 1.4.

Photo 1.4			
Community Phase Number:	1.4	Community Phase Name:	Regenerating paper birch-mixed scrub-blue joint grass-fireweed-moss scrubland
Community Phase Narrative:			
<p>The dominant form of vegetation was regenerating trees, scrubs, graminoids, forbs, and moss. While <i>Betula nealaskana</i> was the most common regenerating tree species, <i>Picea glauca</i> and <i>Populus tremuloides</i> were also observed. Scrubs were primarily a mixture a medium sized <i>Salix alaxensis</i> and <i>Salix bebbiana</i>. The most common graminoid was <i>Calamagrostis canadensis</i>, while the most common forb was <i>Chamerion angustifolium</i>. Moss was an abundant ground cover. This phase had two</p>			

observations.

Community Pathways

Pathway Number	Pathway Name & Description
1.4 a	Normal time and growth without fire disturbance. The aspen and birch present within the sampled sites should mature and the community should resemble phase 1.3. While this phase may burn, the resulting community would likely resemble phase 1.4.

Photo 2.1



Community Phase Number:

2.1

Community Phase Name:

Bare ground-mixed willow-fireweed-scrubland

Community Phase Narrative:

Approximately 80% of sampled plot had exposed rock and soil. Scrub and forbs were the dominant vegetation. The most common medium scrubs were *Salix alaxensis*, while the most common low scrub was *Rosa acicularis*. The most common forbs were *Chamerion angustifolium*, *Descurainia sophioides*, and *Artemisia tilesii*.

Community Pathways

Pathway Number	Pathway Name & Description
1.1 a	No additional phases were documented for this state.

Transition Number:	T1A
To State/Community Phase:	2.0 Landslide State
Transition Narrative:	
<p>Landslides have been observed in this ecological site and are assumed to occur following a fire event. These landslides would cause a transition from the reference state as soil surfaces would remain highly erodible and unfavorable to the successional pathway observed in reference state 1.0.</p>	

Restoration Pathway (copy and paste pages as needed)

Restoration pathway number:	R2A
To state/community phase:	1.0 Reference State
Restoration pathway narrative:	
<p>It is currently unclear whether sites can return to the reference state after a significant mass movement event. In theory, vegetation may stabilize slopes to the point where site impacted by mass movement returns to a community resembling phase 1.3 or 1.4.</p>	