

## Arctic Floodplain Shrubland



**Stratum code:** AFS

**Number of plots sampled:** 23

**Physiography:** riverine (Floodplain physiographic unit)

**Geomorphology:** floodplain

**Landforms:** active floodplain, river and stream bars and banks

**Hydrology:** xeric to mesic, well drained

**Classification:** An upland shrubland type. Average shrub cover is 46.9%; with low shrub cover averaging 26.0% and dwarf shrub cover averaging 20.1%. On low shrub sites, *Salix richardsonii* and *Salix alaxensis* codominate; on dwarf shrub sites *Dryas integrifolia* is dominant.



**Site characteristics:** Occurs across the elevational gradient from the subalpine to the coast. Associated with active floodplains and dry permafrost. Vegetation composition and structure vary depending on the frequency of flooding; a mosaic of bare ground (15.2% average cover), herbs and low to tall shrubs is common. Due to the proximity to flowing water, seasonal thaw is deep, with a mean active layer thickness of 129 cm.

**Soil characteristics:** Soils consist of sorted sand, gravel, and cobble. Because of frequent fluvial erosion and deposition, weathering and soil profile development is minimal. Soils are typically composed of layered sand, gravel, and cobble. On older terraces mineral soils may be overlain by A or B horizons. The mean thickness of moss and duff combined is only 0.6 cm and organic horizons are thin (mean thickness of 2.5 cm). Average soil water pH measured at 10 cm depth is 7.5.

## Arctic Floodplain Shrubland

**Vegetation:** The willows, *Salix richardsonii* and *Salix alaxensis* codominate on tall shrub sites; *Dryas integrifolia* is the dominant shrub on dwarf shrub sites. Nitrogen-fixing species in the Fabaceae family such as *Hedysarum mackenziei*, *Hedysarum americanum*, *Oxytropis borealis*, and *Astragalus alpinus* are characteristic. Indicator species include *Salix alaxensis*, the dry-site species *Arctous rubra*, and the disturbed mineral soil specialist, *Equisetum arvense*. Mosses in the *Tomentypnum* genus show high constancy (>40%). Mean vascular plant species richness is 31 taxa.

### Dominant species:

- *Dryas integrifolia*
- *Hedysarum mackenziei*

**Indicator species** Taxa with significant potential ( $p < 0.0002$ ) to indicate floodplains (listed in decreasing order of indication) include:

- *Salix alaxensis*
- *Arctous rubra*
- *Equisetum arvense*

**Succession and disturbance:** An early-successional type where fluvial erosion and deposition are the main disturbances on these high energy floodplains. Aggradation of sediment or channel migration can move sites out of the elevational and lateral reach of floodwaters allowing sites to develop towards a mid-successional Arctic Floodplain Wetland.

**Indicators of change:** Change in structure or composition; change in hydrologic regime (change in flood intensity or frequency).



## Arctic Floodplain Shrubland

Table 2. Cover and constancy of plant taxa occurring in the Arctic Floodplain Shrubland stratum. Species listed by habit, in decreasing order of percent cover.

Habit	Scientific Name	Average Cover (%)	Standard Deviation (%)	Minimum Cover (%)	Maximum Cover (%)	Constancy (%)
tall shrub	<i>Salix richardsonii</i>	19.6	15.3	2.0	50.7	43
	<i>Salix alaxensis</i>	16.0	8.9	3.3	33.3	61
	<i>Salix pseudomonticola</i>	10.9	na	10.9	10.9	4
	<i>Salix arbusculoides</i>	10.7	11.8	1.3	24.0	13
	<i>Salix niphoclada</i>	10.4	12.8	2.0	36.0	26
	<i>Salix glauca</i>	9.7	9.4	1.3	28.7	39
	<i>Salix pulchra</i>	5.7	2.4	4.0	7.3	9
	<i>Salix hastata</i>	1.3	na	1.3	1.3	4
low shrub	<i>Vaccinium uliginosum</i>	1.4	na	1.4	1.4	4
dwarf shrub	<i>Dryas integrifolia</i>	26.8	24.3	2.7	70.0	48
	<i>Cassiope tetragona</i>	16.7	7.6	11.3	22.0	9
	<i>Arctous rubra</i>	6.9	5.9	1.3	18.7	52
	<i>Arctous alpina</i>	3.4	1.9	2.0	4.7	9
	<i>Salix reticulata</i>	2.9	1.7	1.3	5.3	30
	<i>Salix polaris</i>	2.0	na	2.0	2.0	4
graminoid	<i>Poa glauca</i>	18.4	na	18.4	18.4	4
	<i>Carex bigelowii</i> ssp. <i>ensifolia</i>	16.5	13.2	4.7	30.7	13
	<i>Eriophorum angustifolium</i>	7.3	1.9	6.0	8.7	9
	<i>Festuca rubra</i>	7.3	6.7	2.7	23.3	39
	<i>Carex aquatilis</i>	5.4	3.8	1.3	10.7	26
	<i>Arctagrostis latifolia</i>	4.4	4.7	1.3	12.7	22
	<i>Poa hartzii</i> ssp. <i>alaskana</i>	3.3	na	3.3	3.3	4
	<i>Bromus pumpellianus</i>	2.9	1.6	2.0	6.0	26
	<i>Bromus</i>	2.7	na	2.7	2.7	4
	<i>Carex capillaris</i>	2.7	na	2.7	2.7	4
	<i>Carex saxatilis</i>	2.7	na	2.7	2.7	4
	<i>Carex scirpoidea</i>	2.7	na	2.7	2.7	4
	<i>Elymus alaskanus</i> ssp. <i>alaskanus</i>	2.7	0.9	2.0	3.3	9
	<i>Leymus mollis</i>	2.6	1.2	1.3	3.3	13
<i>Carex borealipolaris</i>	2.4	0.5	2.0	2.7	9	

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Habit	Scientific Name	Average Cover (%)	Standard Deviation (%)	Minimum Cover (%)	Maximum Cover (%)	Constancy (%)
	<i>Carex chordorrhiza</i>	2.0	na	2.0	2.0	4
	<i>Eriophorum russeolum</i>	2.0	na	2.0	2.0	4
	<i>Luzula multiflora</i> ssp. <i>frigida</i>	2.0	na	2.0	2.0	4
	<i>Dupontia fisheri</i>	1.3	na	1.3	1.3	4
	<i>Poa pratensis</i> ssp. <i>alpigena</i>	1.3	0.0	1.3	1.3	9
	<i>Carex krausei</i>	1.3	0.0	1.3	1.3	9
	<i>Carex rotundata</i>	1.3	na	1.3	1.3	4
	<i>Carex williamsii</i>	1.3	na	1.3	1.3	4
	<i>Juncus arcticus</i>	1.3	na	1.3	1.3	4
	<i>Koeleria asiatica</i>	1.3	na	1.3	1.3	4
	<i>Luzula wahlenbergii</i>	1.3	na	1.3	1.3	4
	<i>Poa pratensis</i> ssp. <i>colpodea</i>	1.3	na	1.3	1.3	4
	forb	<i>Hedysarum mackenziei</i>	25.7	6.2	21.3	30.0
<i>Hedysarum americanum</i>		11.6	15.2	1.3	38.0	22
<i>Oxytropis borealis</i>		11.6	12.5	2.7	20.4	9
<i>Eurybia sibirica</i>		7.2	6.1	1.3	15.3	26
<i>Lupinus arcticus</i>		6.0	5.5	1.3	12.0	13
<i>Astragalus umbellatus</i>		6.0	na	6.0	6.0	4
<i>Oxytropis bryophila</i>		4.0	1.0	3.3	4.7	9
<i>Astragalus alpinus</i>		3.9	3.0	1.3	8.7	43
<i>Chamaenerion latifolium</i>		3.4	1.9	2.0	4.7	9
<i>Petasites frigidus</i>		3.4	0.9	2.7	4.0	9
<i>Oxytropis varians</i>		3.0	2.4	1.3	4.7	9
<i>Bistorta vivipara</i>		2.7	1.4	1.3	4.0	13
<i>Polemonium acutiflorum</i>		2.4	0.5	2.0	2.7	9
<i>Tanacetum bipinnatum</i>		2.3	2.0	1.3	5.3	17
<i>Pedicularis verticillata</i>		2.3	1.4	1.3	3.3	9
<i>Anemone parviflora</i>		2.2	0.4	2.0	2.7	13
<i>Parnassia palustris</i>		2.0	0.0	2.0	2.0	9
<i>Aster alpinus</i>		2.0	na	2.0	2.0	4
<i>Pyrola grandiflora</i>		2.0	na	2.0	2.0	4
<i>Saussurea angustifolia</i>		2.0	na	2.0	2.0	4
<i>Erigeron peregrinus</i>	1.4	na	1.4	1.4	4	

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Habit	Scientific Name	Average Cover (%)	Standard Deviation (%)	Minimum Cover (%)	Maximum Cover (%)	Constancy (%)
	<i>Stellaria longipes</i>	1.4	0.1	1.3	1.4	9
	<i>Sparganium hyperboreum</i>	1.3	0.0	1.3	1.3	9
	<i>Micranthes nelsoniana</i> ssp. <i>nelsoniana</i>	1.3	na	1.3	1.3	4
	<i>Ranunculus gmelinii</i>	1.3	na	1.3	1.3	4
	<i>Anemonastrum richardsonii</i>	1.3	na	1.3	1.3	4
	<i>Oxytropis roaldii</i>	1.3	na	1.3	1.3	4
	<i>Parnassia kotzebuei</i>	1.3	na	1.3	1.3	4
	<i>Senecio lugens</i>	1.3	na	1.3	1.3	4
	<i>Silene acaulis</i>	1.3	na	1.3	1.3	4
	<i>Solidago multiradiata</i>	1.3	na	1.3	1.3	4
spore-bearing	<i>Equisetum arvense</i>	10.2	10.3	1.3	35.3	52
	<i>Equisetum scirpoides</i>	9.3	10.5	2.7	24.7	17
	<i>Equisetum variegatum</i>	7.8	7.1	2.0	20.7	30
moss	<i>Sanionia</i>	15.1	22.3	1.3	59.3	26
	<i>Distichium</i>	14.7	12.8	1.3	32.7	22
	<i>Scorpidium</i>	13.3	na	13.3	13.3	4
	<i>Bryum</i>	13.2	1.5	11.3	14.7	17
	<i>Campylium</i>	12.8	20.0	2.0	53.3	26
	<i>Flexitrichum</i>	12.7	na	12.7	12.7	4
	<i>Tomentypnum</i>	12.4	8.6	3.3	26.0	43
	<i>Hylocomium</i>	8.9	6.9	1.3	14.7	13
	<i>Brachythecium</i>	8.9	6.5	3.3	16.0	13
	<i>Hypnum</i>	8.7	na	8.7	8.7	4
	<i>Ptychostomum</i>	8.3	4.8	1.3	12.0	17
	<i>Dicranum</i>	7.5	6.5	1.3	14.7	17
	<i>Catoscopium</i>	6.0	na	6.0	6.0	4
	<i>Ditrichum</i>	5.3	na	5.3	5.3	4
	<i>Drepanocladus</i>	4.7	na	4.7	4.7	4
	<i>Polytrichum</i>	4.0	na	4.0	4.0	4
	<i>Timmia</i>	4.0	na	4.0	4.0	4
	moss	3.4	0.9	2.7	4.0	9
	<i>Meesia</i>	3.3	na	3.3	3.3	4
<i>Plagiomnium</i>	3.3	2.8	1.3	5.3	9	

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Habit	Scientific Name	Average Cover (%)	Standard Deviation (%)	Minimum Cover (%)	Maximum Cover (%)	Constancy (%)
	<i>Climacium</i>	2.7	na	2.7	2.7	4
	<i>Rhytidium</i>	2.7	1.9	1.3	4.0	9
	<i>Cinclidium</i>	2.4	1.4	1.3	4.0	13
	<i>Abietinella</i>	2.3	1.4	1.3	3.3	9
	<i>Syntrichia</i>	2.0	na	2.0	2.0	4
	<i>Pohlia</i>	2.0	0.7	1.3	2.7	13
	<i>Calliergon</i>	2.0	1.1	1.3	3.3	13
	<i>Aulacomnium</i>	1.3	na	1.3	1.3	4
	<i>Encalypta</i>	1.3	na	1.3	1.3	4
	<i>Philonotis</i>	1.3	na	1.3	1.3	4
lichen	crustose lichen	12.7	na	12.7	12.7	4
	<i>Bryocaulon</i>	8.0	na	8.0	8.0	4
	<i>Thamnolia</i>	5.1	3.4	2.7	11.3	26
	<i>Ochrolechia</i>	2.7	na	2.7	2.7	4
	<i>Dactylina</i>	2.5	2.2	1.3	6.7	26
	<i>Peltigera</i>	2.3	1.4	1.3	3.3	9
	<i>Stereocaulon</i>	2.3	1.4	1.3	3.3	9
	<i>Flavocetraria</i>	1.5	0.4	1.3	2.0	13
	<i>Cladonia</i>	1.3	na	1.3	1.3	4
liverwort	liverwort	15.0	9.6	2.7	26.0	17
	<i>Aneura</i>	1.3	na	1.3	1.3	4