TABLE 5 ESSF vegetation table - zonal sites[a]

	Biogeoclimatic Unit	ESSFxv1	ESSFxv2	ESSFwk1	ESSFwc3	
Tree Layer	*Pinus albicaulis*	▮				whitebark pine
	Pinus contorta	▮▮▮▮▮	▮▮▮▮▮			lodgepole pine
	Abies lasiocarpa	▮▮▮	▮	▮▮▮▮	▮▮▮▮▮	subalpine fir
	Picea engelmannii	▮	▮	▮▮▮▮▮	▮▮▮▮▮	Engelmann spruce
Shrub Layer	*Juniperus communis*	▮	▮▮▮			common juniper
	Shepherdia canadensis	▮	▮			soopolallie
	Vaccinium membranaceum	▮		▮▮▮	▮▮▮▮	black huckleberry
	Rhododendron albiflorum			▮▮▮▮	▮▮▮▮▮	white-flowered rhododendron
	Vaccinium ovalifolium			▮▮▮	▮	oval-leaved blueberry
	Ribes lacustre			▮▮▮	▮▮▮	black gooseberry
Herb Layer	*Vaccinium scoparium*	▮▮▮				grouseberry
	Arnica cordifolia	▮▮▮	▮▮▮			heart-leaved arnica
	Lupinus arcticus	▮▮▮	▮▮▮			arctic lupine
	Orthilia secunda	▮▮	▮	▮▮		one-sided wintergreen
	Aster foliaceus		▮▮▮			leafy aster
	Potentilla diversifolia		▮▮			diverse-leaved cinquefoil
	Pedicularis bracteosa		▮▮			bracted lousewort
	Vaccinium caespitosum	▮	▮▮▮			dwarf blueberry
	Cornus canadensis			▮▮▮		bunchberry
	Clintonia uniflora			▮▮▮	▮	queen's cup
	Tiarella trifoliata			▮▮▮	▮	three-leaved foamflower
	Gymnocarpium dryopteris			▮▮▮▮▮	▮▮▮	oak fern
	Lycopodium annotinum			▮▮▮	▮▮	stiff clubmoss
	Valeriana sitchensis			▮▮▮	▮▮▮▮	Sitka valerian
	Veratrum viride			▮▮▮	▮▮▮	Indian hellebore
	Streptopus roseus			▮▮▮	▮▮▮	rosy twistedstalk
	Tiarella unifoliata			▮	▮▮▮	one-leaved foamflower
	Mitella breweri				▮	Brewer's mitrewort
Moss Layer	*Peltigera* spp.	▮	▮▮▮			pelt lichens
	Cladonia spp.	▮▮▮	▮▮▮▮▮		▮	cladonia lichens
	Ptilidium spp.		▮▮			
	Cetraria spp.		▮			cetraria lichens
	Peltigera aphthosa	▮	▮▮▮	▮		freckle pelt
	Dicranum spp.	▮▮▮▮	▮▮▮	▮▮▮	▮▮▮	heron's-bill mosses
	Brachythecium spp.	▮	▮▮▮	▮▮▮	▮▮▮▮	ragged mosses
	Ptilium crista-castrensis			▮▮▮▮▮		knight's plume
	Pleurozium schreberi			▮▮▮▮▮	▮▮▮	red-stemmed feathermoss
	Mnium spp.			▮▮▮▮	▮▮▮	leafy mosses
	Barbilophozia spp.			▮▮▮	▮▮▮▮	leafy liverworts
	Rhytidiopsis robusta				▮▮▮	pipecleaner moss

[a]Species abundance: ▮ present in 40–60% of plots surveyed; ▮▮ >60% of plots, mean cover <1%; ▮▮▮ >60% of plots, mean cover 1–7%; ▮▮▮▮ >60% of plots, mean cover >7–15%; ▮▮▮▮▮ >60% of plots, mean cover >15%

ESSFxc, ESSFdc2, and ESSFmv1 not included due to no data from Cariboo Forest Region.

Although these are seral forests, eventually replaced by Engelmann spruce and subalpine fir forests, they are long-lived seral stages due to slow tree growth in this very cold, very dry climate. Spruce and subalpine fir regeneration is common in the understory. The undergrowth vegetation is typically dominated by dwarf shrubs, low- to medium-height forbs, mosses, and lichens. Common shrub or semi-shrub species are black crowberry, grouseberry, and mountain-heather. In contrast to other ESSF units in the Region except the ESSFxc, white-flowered rhododendron occurs primarily on north-facing slopes and is seldom abundant.

ESSFxv1 Variant The ESSFxv1 is the most extensive of the two ESSFxv variants, extending from the east side of Taseko Lakes west to Tweedsmuir Park on the Pacific Ranges. It also includes the ESSF in the Itcha and Ilgachuz mountains. Precipitation amounts are estimated to be somewhat greater than in the ESSFxv2 and are probably highest in western parts of the variant. The terrain is more rugged, the summits higher, and slopes generally steeper than in the ESSFxv2. The vegetation on zonal sites has more abundant subalpine fir in both the canopy and regeneration layers. The herbaceous layer also has more abundant grouseberry.

ESSFxv2 Variant The ESSFxv2 extends from the east slopes of Anvil Mountain eastward to the east slopes of the Camelsfoot Range, overlooking the Fraser River valley. It includes the highest forested elevations of the Chilcotin and Camelsfoot ranges. Precipitation is probably less in general than in the ESSFxv1. The terrain is largely rounded summits with many slopes of gentle to moderate gradients. Mature forests are dominated by lodgepole pine with relatively little tree regeneration. Subalpine fir is much less abundant than in the ESSFxv1, and stands are more often single-layered.

ESSFxc Subzone The ESSFxc occurs primarily in the Kamloops Forest Region (Lloyd *et al*. 1990) and has a very small area (115 km^2) within the Cariboo Forest Region on the Marble Range, west of Clinton. Here and in the Kamloops Forest Region it occurs above the MSxk Subzone. Vegetation similarities to the ESSFxv include the presence of grouseberry and kinnikinnick and the relatively sparse occurrence of white-flowered rhododendron.

ESSFxv1
ENGELMANN SPRUCE–SUBALPINE FIR VERY DRY VERY COLD SUBZONE WEST CHILCOTIN VARIANT

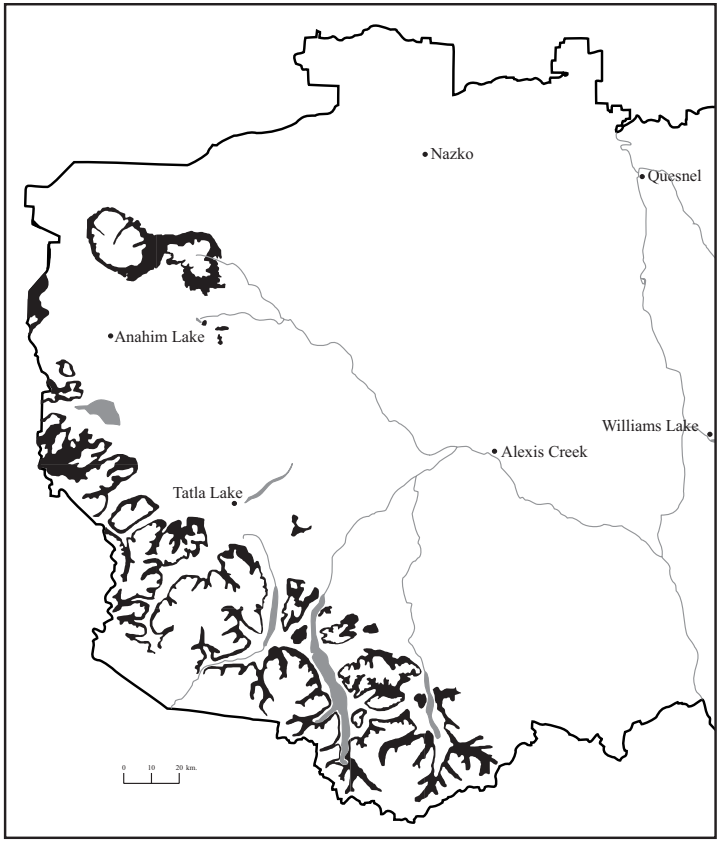
The ESSFxv1 includes the highest-elevation forests on the leeward slopes of the Coast Mountains west of Taseko Lakes. It extends from Anvil Mountain west to Tweedsmuir Park and also occurs in the Itcha and Ilgachuz mountains. The ESSFxv1 landscape ranges from low rounded summits with little dissected slopes along its eastern edge to high rugged mountains in central and western portions. Elevations are primarily 1650–2100 m.

The site series classification presented here applies primarily to the low and middle elevations of the ESSFxv1. Forests at the upper elevations of the ESSFxv1 have not been sufficiently well sampled to develop a site series classification. The upper-elevation forests typically have a very open tree canopy and contain many herb and dwarf shrub species typically found in alpine tundra vegetation. Openings in these highest-elevation forests often have vegetation similar to that of alpine tundra sites.

Distinguishing Adjacent Units from the ESSFxv1

The **ESSFxv2** occurs at similar elevations east of Anvil Mountain in the headwaters of Big and Churn creeks. The **MSxv** lies below the ESSFxv1 on the Fraser Plateau and slopes of the Coast Mountains that overlook the Fraser Plateau. The **MSdc2** and **MSdv** occur below the ESSFxv1 in the valleys of the Coast Mountains near Chilko and Taseko lakes. The **IDFdw** is mapped directly below the ESSFxv1 locally in valleys of the Coast Mountains where slopes are so steep that the transition from IDF to ESSF is very short. The **CWH** zone occurs below the ESSFxv1 locally at the southern end of Chilko Lake. The **MHmm2**, which has a coastal transition climate, occurs below the ESSFxv1 in the Homathko and Mosley river valleys near the Vancouver Forest Region boundary.

Distribution of ESSFxv1 Variant in the Cariboo Forest Region



The **AT** zone occurs above the ESSFxv1 and includes the parkland where clumps of short trees occur in a matrix of alpine tundra vegetation.

In the **ESSFxv2**, zonal sites have:
- little or no grouseberry;
- less abundant subalpine fir and soopolallie;
- more abundant arctic lupine, northwestern sedge, and wild strawberry.

In the **MSxv**, zonal sites have:
- common pinegrass and prickly rose;
- more abundant red-stemmed feathermoss and bunchberry;
- little or no subalpine fir, arctic lupine, mountain sagewort, whitebark pine, or white-flowered rhododendron.

wet sites have:
- little or no Sitka valerian, Indian hellebore, or pink mountain-heather.

In the **MSdc2 and MSdv**, zonal sites have:
- abundant red-stemmed feathermoss, knight's plume moss, and Sitka alder;
- common pinegrass, prickly rose, and step moss;
- little or no arctic lupine, mountain sagewort, or pink mountain-heather.

In the **IDFdw**, zonal sites have:
- common Douglas-fir and pinegrass.

In the **CWH**, zonal sites have:
- western redcedar, western hemlock, and feathermosses;
- little or no grouseberry or cladonia lichens.

In the **MHmm2**, zonal sites have:
- mountain hemlock, amabilis fir, pipecleaner moss, and red-stemmed feathermoss;
- little or no grouseberry or cladonia lichens.

In the **AT**, zonal sites have:
- non-forest vegetation (alpine tundra);
- trees, if present, seldom more than 8 m tall.

Site Units of the ESSFxv1

Zonal Site Series **01 Bl - Arnica - Cladonia Site Series** is the predominant site series of the ESSFxv1. It is most common on mid slope positions but also extends to upper and lower slope positions and

level sites. Subalpine fir and Engelmann spruce are climax species but, due to past wildfires and slow rates of succession in this cold, dry climate, most natural mature stands are dominated by lodgepole pine. The undergrowth vegetation has a sparse shrub layer and a low to moderate cover of low forbs, principally heart-leaved arnica, grouseberry, and arctic lupine. Several other herbaceous species are present but have very low cover values. The moss/lichen layer is relatively sparse and primarily *Dicranum* mosses and cladonia lichens.

Drier Sites Sites drier than those of the zonal site series occur on hill crests, steep slopes, south and west aspects, and coarse soils. They are moderately common. Compared to zonal or other mesic sites they have a greater abundance and diversity of lichens, more abundant common juniper, and little or no Sitka valerian.

02 BlPa - Juniper - Cladonia Site Series occurs on ridge tops and other crest slope positions where bedrock is near (<50 cm) the surface. Soils typically contain high amounts of coarse fragments. The mature forest canopy is moderately open and most often dominated by lodgepole pine. Equal amounts of whitebark pine are sometimes present. Subalpine fir is common in the understory. The undergrowth vegetation is sparse and typically includes scattered common juniper, a few low herbs, and abundant lichens.

03 Pl - Cladonia - Stereocaulon Site Series has been recorded only in the Itcha Mountains but is probably more widely distributed. It occurs on coarse glaciofluvial soils, primarily on gentle outwash slopes and terraces. The mature forest canopy is typically very open and dominated by lodgepole pine. Shrubs and herbaceous species (primarily common juniper, grouseberry, and crowberry) are sparse but lichens are very abundant. Lichens, especially *Cladina, Cladonia,* and *Stereocaulon* species, typically cover more than 50% of the soil surface and distinguish these sites from those in other site series.

04 BlPa - Juniper - Grouseberry Site Series occurs on upper slope positions of steep south- and west-facing slopes. Soils usually have a very high coarse fragment content. The mature forest canopy on these dry ecosystems consists of relatively open-grown whitebark pine and lodgepole pine. Both pines as well as subalpine fir are common in the understory. The undergrowth vegetation has abundant common

juniper and, occasionally, soopolallie. Herbaceous plants typically have a sparse cover consisting of a small number of species. Heart-leaved arnica and grouseberry are usually present.

05 BlPa - Arnica - Twinflower Site Series occurs on upper slope positions of moderate to steep north- and east-facing slopes. Soils are often gravelly and sometimes less than 50 cm deep over bedrock. In contrast to /02 sites, which also have near-surface bedrock, sites do not occur on crests or on upper slopes with a strongly convex surface shape. The mature forest canopy is typically dominated by a mixture of lodgepole pine, whitebark pine, and subalpine fir. Subalpine fir regeneration is often dense. Undergrowth vegetation has a sparse to moderate cover of low shrubs (common juniper, falsebox, and black huckleberry) and herbaceous species (especially heart-leaved arnica, twinflower, and grouseberry). The presence of twinflower and one-sided wintergreen together with the low percent (<5%) cover of white-flowered rhododendron distinguishes the vegetation of these sites.

06 Bl - Rhododendron - Crowberry Site Series occurs on mid and upper slope positions of gentle to steep, north- and east-facing slopes. It also occurs on lower slopes with coarse-textured soils where these soils are moistened by intermittent seepage. The mature forest canopy is dominated by lodgepole pine or subalpine fir. Whitebark pine and spruce are also usually present. The undergrowth vegetation is distinguished by abundant white-flowered rhododendron and occasionally black huckleberry. Grouseberry, crowberry, and heart-leaved arnica dominate the herb layer.

Wetter Sites Sites wetter than mesic are relatively common but generally small. They occur on lower and toe slope seepage areas and in local depressions. In addition to being moist or wet, they are typically sites of cold air accumulation. The undergrowth is distinguished from drier site series by the presence of palmate coltsfoot, Indian hellebore, Sitka valerian, black twinberry, or horsetail species.

07 Bl - Valerian - Arnica Site Series occurs on mid to toe slope positions of gentle to moderate gradient slopes where soils are moistened by intermittent to persistent seepage. Most sites are on north- or east-facing slopes. The mature forest canopy is often a mixture of Engelmann spruce or subalpine fir and lodgepole pine. Herbaceous species, ranging from low to medium height, are abundant

and dominate the undergrowth. Principal species include Sitka valerian, heart-leaved arnica, one-sided wintergreen, arctic lupine, and Indian hellebore. Mosses are typically more abundant than on drier sites and are principally *Brachythecium* and *Dicranum* species.

08 Bl - Horsetail - Glow moss Site Series is common on toe slope positions and in small depressions where a water table is near the surface and soils are gleyed or strongly mottled. It occurs primarily in valley bottoms where cold air accumulates. The mature forest canopy is moderately open and dominated by lodgepole pine and Engelmann spruce. Low shrubs (especially Labrador tea, black twinberry, willows, and scrub birch) are moderately abundant. Crowberry and several low- to medium-height forbs dominate the relatively well-developed herb layer. The vegetation, which has similarities to bog wetlands, is distinguished by Labrador tea, western bog-laurel, and sphagnum moss.

09 Bl - Twinberry - Hellebore Site Series occurs on toe slope positions and in depressions with a near-surface water table or abundant near-surface seepage flow. In contrast to the /08 site series, sites occur primarily on valley side slopes, which are better drained of cold air than valley bottoms. The mature forest canopy is dominated by Engelmann spruce and subalpine fir and the undergrowth is distinguished by a vigorous herbaceous layer containing several species indicative of wet, rich sites. These include clasping twistedstalk, fringed grass-of-Parnassus, cow-parsnip, and abundant *Brachythecium* and leafy mosses. The vegetation has fewer similarities to bog wetlands than do /08 sites.

Non-forested Sites The natural landscape of the ESSFxv1 is mostly forested but several small wetlands occur in depressions and on seepage slopes and are primarily fens. Moist meadows occur in valley bottoms where cold air collects and are similar to alpine communities. Grasslands are very uncommon and primarily on steep south aspects.

Key to Site Units of the ESSFxv1

1a. Soils shallow (<50 cm), bedrock outcrops often present; slope position mostly crest; moisture regime very xeric to subxeric.
ESSFxv1/02 BlPa - Juniper - Cladonia

1b. Soils deeper (sometimes <50 cm in /05), bedrock outcrops usually absent; slope position not crest except on subdued hills; moisture regime subxeric or wetter.

2a. Slope gradient >30%.

3a. Slope aspect SE, S, SW, or W; moisture regime subxeric or submesic; one-sided wintergreen and twinflower usually absent or incidental.

ESSFxv1/04 BlPa - Juniper - Grouseberry

3b. Slope aspect NW, N, NE, or E; moisture regime predominantly submesic or mesic; one-sided wintergreen or twinflower present.

4a. White-flowered rhododendron cover >15%, crowberry usually present.

ESSFxv1/06 Bl - Rhododendron - Crowberry

4b. White-flowered rhododendron cover generally <2%; crowberry usually absent or incidental.

ESSFxv1/05 BlPa - Arnica - Twinflower

2b. Slope gradient <30%

5a. Moisture regime subxeric, submesic, or mesic; slope position mostly upper or mid; no evidence of persistent seepage or water table within 1 m of surface; Sitka valerian, Indian hellebore, pink wintergreen, globeflower, Labrador tea, sphagnum moss, and leafy mosses absent or incidental.

6a. Soil texture sand or loamy sand, and gravel content high; moisture regime subxeric or submesic; cover of ground lichens >30%.

ESSFxv1/03 Pl - Cladonia - Stereocaulon

6b. Soil texture mostly sandy loam or finer but if sand then generally fine sands, and gravel content not high; moisture regime submesic or mesic.

7a. White-flowered rhododendron cover >15%.

ESSFxv1/06 Bl - Rhododendron - Crowberry

7b. White-flowered rhododendron <15% (mostly <2%) cover.

ESSFxv1/01 Bl - Arnica - Cladonia

5b. Moisture regime subhygric to subhydric; slope position lower, toe, or depression (occasionally mid in /07); evidence of seepage water or water table within 1 m of surface; Sitka valerian, Indian hellebore, pink wintergreen, globeflower, Labrador tea, sphagnum moss, or leafy mosses present.

8a. Moisture regime subhygric; water table or free seepage water flow not present within 50 cm of surface; slope position lower or toe; pelt lichens and bracted lousewort usually present; globeflower, Labrador tea, sphagnum moss, scrub birch, and horsetails absent or incidental.

ESSFxv1/07 Bl - Valerian - Arnica

8b. Moisture regime hygric or subhydric; water table or free seepage water flow usually present within 50 cm of surface; slope position toe or depression; pelt lichens and bracted lousewort usually absent; globeflower, Labrador tea, sphagnum moss, scrub birch, or horsetail species present.

9a. Labrador tea, crowberry, and sphagnum moss present; bluejoint absent or incidental; sites mostly in valley bottoms where cold air accumulates.

ESSFxv1/08 Bl - Horsetail - Glow moss

9b. Labrador tea, crowberry, and sphagnum moss absent or incidental; bluejoint present; sites mostly on terraces and in concave areas on valley side slopes with better cold air drainage.

ESSFxv1/09 Bl - Twinberry - Hellebore

ESSFxv1 Edatopic Grid

Site Series

01 **B1** - Arnica - Cladonia
02 **B1Pa** - Juniper - Cladonia
03 **P1** - Cladonia - Stereocaulon
04 **B1Pa** - Juniper - Grouseberry
05 **B1Pa** - Arnica - Twinflower
06 **B1** - Rhododendron - Crowberry
07 **B1** - Valerian - Arnica
08 **B1** - Horsetail - Glow moss
09 **B1** - Twinberry - Hellebore

Site Features of ESSFxv1 Site Series

Site Series	01	02	03	04	05
Key Features	zonal and other gently to moderately sloping sites with mesic or near-mesic moisture regime	dry crests and some upper slopes with shallow soils (< 50 cm) over bedrock	level to gently sloping sites with dry, very gravelly sandy soils	upper slope positions on steep S and W aspects; soils usually have high coarse fragment content	upper slope positions on steep N and E aspects; soils usually have high coarse fragment content
Soil Moisture / Nutrient Regimes	mesic, submesic / poor - rich	very xeric - subxeric / very poor - rich	xeric, subxeric / very poor, poor	subxeric, submesic / poor - rich	submesic (subxeric) / poor - rich
Slope Position	mid (upper, lower, level)	crest (upper)	level	upper, mid	upper
Aspect	all	all	all	SE, S, SW, W	NW, N, NE, E
Slope Grade %	0 - 30	0 - 70	0 - 5	35 - 70	20 - 70
Soil Texture	loamy, sandy; often gravelly	loamy, sandy; usually gravelly or rubbly	gravelly sandy	gravelly and rubbly loamy (sandy)	gravelly and rubbly loamy
Humus Form and Thickness (cm)	Hemimor, Mormoder 3 - 10	Xeromor 1 - 3	Xeromoder 1 - 3	Xeromoder, Mormoder 1 - 10 (25)	Xeromoder, Mormoder 3 - 8
Occurrence / Size / Distribution	common / medium - large / wide	uncommon / small / wide	uncommon / medium / recorded only in Itcha Mt. area	common / medium / wide	common / medium / wide

Site Features of ESSFxv1 Site Series (continued)

Site Series	06	07	08	09
Key Features	mid to upper slopes of gentle to steep NW, N, NE, and E aspects; also on lower slopes with coarse soils	moist seepage sites on mid to lower slopes; mostly N aspects; intermittent or persistent seepage	toe slope positions and small depressions with near-surface (< 50 cm) water table; mostly valley bottoms	toe slope positions and small depressions with near-surface (< 50 cm) water table on valley slopes and hillsides; persistent seepage
Soil Moisture / Nutrient Regimes	submesic, mesic (subhygric) / poor, medium	subhygric (mesic - hygric) / poor - rich	hygric, subhydric / poor - rich	hygric, subhydric / rich - very rich
Slope Position	mid, upper	mid, lower	toe, depression	toe, depression
Aspect	NW, N, NE, E	NW, N, NE, E	all	N/A
Slope grade %	10 - 70	0 - 35	0 - 10	0 - 5
Soil Texture	gravelly loamy and sandy	loamy, often gravelly	loamy and silty	loamy, silty
Humus Form and Thickness (cm)	Hemimor, Hemihumimor 1 - 10 (25)	Hemihumimor, Mormoder 7 - 20	Hemimor, Saprimull > 20	Histomoder > 10
Occurrence / Size / Distribution	common / medium - large / wide	common / small - medium / wide	common / small / wide	uncommon / small / wide

ESSFxv1 Vegetation Table[a]

	Site Unit	02	03	04	05	06	01	07	08	09	
Tree Layer	*Abies lasiocarpa*	▮▮		▮	▮▮▮	▮▮▮▮	▮▮▮	▮▮▮▮	▮	▮▮▮	subalpine fir
	Pinus albicaulis	▮▮▮▮		▮	▮▮▮▮	▮▮▮	▮	▮		▮▮▮	whitebark pine
	Pinus contorta	▮▮▮	▮▮▮▮▮	▮	▮▮▮▮	▮▮▮▮	▮▮▮▮▮	▮▮▮▮	▮▮▮▮	▮▮▮	lodgepole pine
	Picea engelmannii						▮	▮▮▮▮	▮	▮	Engelmann spruce
Shrub Layer	*Vaccinium scoparium*	▮	▮▮▮	▮▮▮	▮	▮▮▮▮	▮▮▮	▮	▮▮▮▮	▮▮▮	grouseberry
	Rhododendron albiflorum				▮	▮▮▮▮▮		▮	▮	▮▮▮	white-flowered rhododendron
	Salix sp.								▮▮▮▮		willow
	Betula glandulosa								▮▮▮		scrub birch
	Lonicera involucrata							▮	▮▮▮	▮▮▮	black twinberry
	Paxistima myrsinites	▮								▮▮	falsebox
Herb Layer	*Artemisia norvegica*		▮▮		▮	▮▮▮	▮	▮			mountain sagewort
	Epilobium angustifolium		▮▮	▮	▮		▮	▮▮	▮	▮▮	fireweed
	Arnica cordifolia			▮▮▮	▮▮▮	▮▮▮	▮▮▮	▮▮▮	▮	▮▮	heart-leaved arnica
	Pedicularis bracteosa				▮			▮▮▮			bracted lousewort
	Linnaea borealis				▮▮▮		▮	▮	▮	▮▮▮	twinflower
	Achillea millefolium			▮			▮	▮			yarrow
	Thalictrum occidentale				▮			▮		▮▮▮	western meadowrue
	Cornus canadensis					▮		▮	▮▮▮	▮▮▮	bunchberry
	Empetrum nigrum		▮▮			▮▮▮▮	▮	▮	▮▮▮▮▮		crowberry
	Valeriana sitchensis					▮		▮▮▮▮	▮	▮▮▮▮	Sitka valerian
	Vaccinium caespitosum						▮		▮▮▮▮		dwarf blueberry
	Veratrum viride							▮▮▮		▮▮▮▮	Indian hellebore
	Sanguisorba canadensis								▮▮▮	▮▮▮▮	Sitka burnet
	Calamagrostis canadensis							▮		▮▮▮	bluejoint
	Trollius laxus									▮▮▮	globeflower
	Erigeron peregrinus							▮		▮▮▮	subalpine daisy
	Heracleum lanatum							▮		▮▮▮	cow-parsnip
	Parnassia fimbriata									▮▮▮	fringed grass-of-Parnassus
	Streptopus amplexifolius									▮▮▮	clasping twistedstalk
Moss Layer	*Cladina* spp.	▮	▮▮▮▮								reindeer lichens
	Polytrichum spp.		▮▮▮▮						▮		haircap mosses
	Stereocaulon spp.		▮▮▮▮								coral lichens
	Peltigera spp.	▮▮▮		▮	▮▮▮		▮	▮▮▮			pelt lichens
	Cladonia spp.	▮▮▮	▮▮▮▮▮	▮▮	▮	▮▮▮	▮▮▮	▮			cladonia lichens
	Dicranum spp.	▮▮▮		▮	▮	▮▮▮▮	▮▮▮▮	▮▮▮▮			heron's-bill mosses
	Aulacomnium palustre								▮▮▮▮▮	▮▮▮▮	glow moss
	Brachythecium spp.				▮		▮	▮▮▮▮		▮▮▮▮▮	ragged mosses
	Drepanocladus uncinatus							▮		▮▮▮▮	sickle moss
	Mnium spp.									▮▮▮▮▮	leafy mosses

[a] Species abundance: ▮ present in 40–60% of plots surveyed; ▮▮ >60% of plots, mean cover <1%; ▮▮▮ >60% of plots, mean cover 1–7%; ▮▮▮▮ >60% of plots, mean cover >7–15%; ▮▮▮▮▮ >60% of plots, mean cover >15%

ESSFxv1 Silviculture Considerations

Silviculture Practices and Options

Very little timber harvesting has been conducted to date and there is very little silviculture experience in the ESSFxv1. Consequently, the silviculture considerations presented here are less complete and more tentative than those presented for other biogeoclimatic units. In general, silviculture systems and regeneration constraints are similar to those of the MSxv except that growing seasons are shorter, frost is likely more frequent, and soils are generally colder. The ESSFxv1 is probably the least productive area for timber production, outside of the BG and AT zones, in the Cariboo Forest Region.

Predominant silviculture system for the very small number of currently harvested sites in the ESSFxv1 is even-aged management (clearcutting). Mesic and drier sites have been managed primarily for lodgepole pine and most have been planted with pine rather than relying on natural regeneration. Wetter sites have been planted with spruce or pine–spruce mixtures on screefed or scarified patches.

Partial harvest systems experience in the ESSFxv1 is non-existent, although a research trial in the MSxv at lower elevations indicates that openings 30 m or more wide in lodgepole pine stands may be restocked naturally with lodgepole pine natural regeneration ingress.

Advance regeneration on mesic sites in the ESSFxv1 ranges from sparse to moderate density and is primarily subalpine fir with some spruce. Growth of subalpine fir in the ESSFxv1 is very slow.

Principal Insect, Disease, and Abiotic Damage Concerns

There are relatively few insect and disease concerns in the ESSFxv1. The incidence and severity of mountain pine beetle attacks, dwarf mistletoe, and rusts are much less than in the SBPS. Abiotic damage, especially summer frost effects, are generally of greatest concern.

Silviculture Considerations Table — Harvest Assumptions

No or limited canopy refers to clearcuts and larger (generally >60 m wide between mature timber edges) group selection systems;

Canopy present refers primarily to group selection systems with small and moderate-size (generally 25–60 m wide) groups; does not include canopy resulting from low-volume single tree selection systems except on wet spruce sites (site series /08 and /09).

ESSFxv1 Site Series - Silviculture Considerations

Site series	Ecologically adapted tree species	Principal site factors limiting tree establishment and early growth		Vegetation potential and complex
		No or limited canopy	Canopy present	
01	P:Pl Se Bl S:Pa	***moisture deficits*** Se, Bl ***summer frost (gentle slopes)*** Pl, **Se**, **Bl**, Pa ***light deficits (vegetation overtop)*** ----	---- Se, **Bl** Pl, Pa	low: Dry shrub - dwarf ericaceous shrub •cover of low forbs and grasses increases somewhat following canopy opening.
	•**Pl** natural regeneration expected to be adequate to restock cleared sites if sufficient numbers of cones present and well distributed; although scarification likely not required for seedbed management, regeneration period will likely be shortened by drag scarification conducted very soon after logging; •survival and growth of planted **Pl** expected to be adequate to restock cleared and partial-cut sites if planted in sunny / lightly shaded microsites; •frost damage to **Se** and **Bl** may be reduced if planted with **Pl** in **Pl**-dominated mixtures; •frost damage to **all species** may be reduced by planting on exposed mineral soil; •maintenance of soil organic layers and woody debris important for long-term site productivity and natural regeneration.			
02	P:Pl Pa T:Bl	***moisture deficits*** Pl, Pa, **Bl** ***winter dessication*** Pl, Pa, Bl ***rooting restrictions (bedrock)*** ***nutrient deficits***	 Pl, Pa, **Bl** Pl, Pa, Bl	low: Dry shrub - dwarf ericaceous shrub •cover of low forbs and grasses increases little following canopy opening.
	•very low productivity for trees and extremely difficult to restock; •maintenance of soil organic layers and woody debris important for long-term site productivity and natural regeneration.			

ESSFxv1 Site Series - Silviculture Considerations (continued)

Site series	Ecologically adapted tree species	Principal site factors limiting trree establishment and early growth		Vegetation potential and complex
		No or limited canopy	Canopy present	
03	P:Pl S:Pa	***moisture deficits*** Pl, Pa ***summer frost*** Pl, Pa ***nutrient deficits***	 Pl, Pa ----	low: Dry shrub - dwarf ericaceous shrub •shrub and herbaceous vegetation increases little following canopy opening.
	•**Pl** natural regeneration expected to be adequate to restock cleared sites if sufficient numbers of cones present and well distributed; although scarification likely not required for seedbed management, regeneration period will likely be shortened by drag scarification conducted very soon after logging; •insufficient experience to predict **Pa** natural ingress or advance regeneration release; •maintenance of soil organic layers and woody debris important for long-term site productivity and natural regeneration.			
04	P:Pl Pa T:Bl Se	***moisture deficits*** Pl, Pa, **Bl**, **Se** ***winter dessication*** all species ***light deficits*** ----	 Pl, Pa, **Bl**, **Se** all species Pl, Pa	low: Dry shrub - dwarf ericaceous shrub
	•growth of **Bl** and **Se** poor due to moisture deficits; •**Pl** natural regeneration likely adequate to restock sites if sufficient numbers of cones present and well distributed; scarification probably not required but may shorten regeneration delay period.			

ESSFxv1 Site Series - Silviculture Considerations (continued)

Site series	Ecologically adapted tree species	Principal site factors limiting tree establishment and early growth		Vegetation potential and complex
		No or limited canopy	Canopy present	
05	P:Pl	***moisture deficits***		low: Mixed shrub - low forb
	Pa	Bl, Se	Bl, Se	
	S:Bl	***light deficits***		
	Se	----	Pl, Pa	
	•growth of **Bl** and **Se** generally slow, limited by moisture stress; •**Pl** or **Pa** plantations may be suitable option for these sites; •**Pl** natural regeneration expected to be adequate to restock sites if sufficient numbers of cones present and well distributed.			
06	P:Pl	***moisture deficits***		medium: Ericaceous shrub - rhododendron
	S:Bl	Bl, Se	----	
	Se	***summer frost (gentle slopes):***		•cover of white-flowered rhododendron changes little following canopy removal and recovers slowly after clearing or damage to above-ground stems.
	T:Pa	Bl, Se	Bl, Se	
		light deficits (vegetation overtop)		
		Pl, Se, **Pa**	**Pl**, Se, **Pa**	
	•competing vegetation limits plantation survival and growth as well as natural regeneration ingress.			

ESSFxv1 Site Series - Silviculture Considerations (continued)

Site series	Ecologically adapted tree species	Principal site factors limiting tree establishment and early growth		Vegetation potential and complex
		No or limited canopy	Canopy present	
07	P:Pl	***summer frost***		medium: Mixed shrub - moist forb
	Bl	Bl, Se	Bl, Se	
	Se	***light deficits***		•abundance and vigour of shrub and herb vegetation variable; on some sites vegetation may increase dramatically following canopy opening.
	T:Pa	Pl, Pa	Pl, Pa	
		cold, moist soils		
		all species	all species	
	•survival and growth of planted **Pl, Bl,** and **Se** expected to be adequate to restock cleared and partial-cut sites if vegetation controlled at planting spot and (for **Pl** in partial cuts) if planted in sunny / lightly shaded microsites; •Pl natural regeneration generally limited by cold, moist soils and relatively thick forest floor; ingress may be adequate to restock sites if sufficient cones present and well distributed on mineral soil and if competing vegetation is reduced.			
08	P:Pl	***cold, wet soils***		medium: Mixed shrub - sphagnum
	Se	**all species**	**all species**	
	Bl	***summer frost***		•vegetation development limited by cold, wet soils.
		Pl, **Se**, **Bl**	Pl, **Se**, **Bl**	
		light deficits (vegetation overtop)		
		Pl	Pl	
	•productivity for timber very low, and sites very difficult to restock.			

ESSFxv1 Site Series - Silviculture Considerations (continued)

Site series	Ecologically adapted tree species	Principal site factors limiting tree establishment and early growth		Vegetation potential and complex
		No or limited canopy	Canopy present	
09	P:Se	***cold, wet soils***		medium to high: Mixed shrub - wet forb
	Bl	Se, Bl, Pl	Se, Bl, Pl	
	S:Pl	***summer frost***		
		Se, **Bl**	Se Bl	
		light deficits		
		Se, Bl, **Pl**	Se, Bl, **Pl**	

- survival and growth of planted **Se**, **Bl,** and **Pl** expected to be adequate to restock site if planted on raised microsites and if vegetation controlled at planting spot;
- natural regeneration of **Pl** not a reliable restocking option due to cold, thick soil organic layers and frequent lack of **Pl** cones.

TABLE A1.1. Site units (shaded) in the Cariboo Forest Region and their precorrelation equivalents (unshaded).

Current (correlated) BEC unit code												
BEC Unit		Site unit										
		/01	/02	/03	/04	/05	/06	/07	/08	/09	/10	/11
		Equivalent precorrelation code										
	BEC Unit	Ecosystem unit										
AT	AT	(site units not yet described)										
BGxh3	PPBGg	(see Iverson and Coupé 1996a)										
BGxw2	PPBGe	(see Iverson and Coupé 1996b)										
CWHds1	CWHc	see Guide for Vancouver Region (Green and Klinka 1994)										
ESSFdc2	ESSFe1	see Guide for Kamloops Forest Region (Lloyd et al. 1990)										
ESSFwc3	ESSFh2	/01	/02	/03								
ESSFwk1	ESSFh1	/01	/02	/03	/05	/04	/07 in part	/07 in part				
ESSFxc	ESSFd	see Guide for Kamloops Forest Region (Lloyd et al. 1990)										
ESSFxv1	ESSFg, ESSF undif	npe	npe	npe	npe	npe	npe	npe	npe			
ESSFxv2	ESSFg, ESSF undif	npe	npe	npe	npe	npe	npe	npe	npe			
ICHdk	ICHe3	/01	/02	/03	/04	/05	/06	/07	/08	/09		
ICHmk3	ICHe2	/01,/04	/02	/03	/05	/06	/07	/08				
ICHmw3	ICHm1	see Guide for Kamloops Forest Region (Lloyd et al. 1990)										
ICHwk2	ICHh1	/01,/05	/02	/03	/04	/06 in part	/06 in part	/07	/08			
ICHwk4	ICHh2	/01,/06	/02	/03	/04	/05	/07	/08	/09			
IDFdk3	IDFb2	/01	/03	/02	/05	/04	/06	/07	/08	/09, /10		
IDFdk4	IDFb5	/01	/02	/03	/04	/05	/06	/07	/08	/09	/10	
IDFdw	IDFundiff.	npe	npe	npe	npe	npe	npe	npe	npe			
IDFmw2	IDFj1	see Guide for Kamloops Forest Region (Lloyd et al. 1990)										
IDFxm	IDFa4	/01	/02	/03	/04	/05	/06	/07	/08	/09		
IDFxw	IDFa2	/01,/05,/07	/02	/03	/04	/06	/08	/09				

[a]No previous equivalent (npe)

TABLE 5.2.1 *Distribution of Fen Site Associations by biogeoclimatic zone*

		BG PP	BWBS SWB	ESSF	ICH	IDF	MS	SBPS SBS	CDF	CWH	MH
Wf01	Water sedge – Beaked sedge		xx	x	xx	xxx	xxx	xxx		x[i]	
Wf02	Scrub birch – Water sedge		xxx	x	xx	xx	xx	xx			
Wf03	Water sedge – Peat-moss			xx				x			
Wf04	Barclay's willow – Water sedge – Glow mosss		x	xxx			x	x			
Wf05	Slender sedge – Common hook-moss		x		xx	xx	xx	xx			
Wf06	Slender sedge – Buckbean		x		x	x		x			
Wf07	Scrub birch – Buckbean – Shore sedge		x		x	x		x			
Wf08	Shore sedge – Buckbean – Hook-moss		x	x		x	x	x			
Wf09	Few-flowered spike-rush – Hook-moss			x			x	x			
Wf10	Hudson Bay clubrush – Red hook-moss							x			
Wf11	Tufted clubrush – Star moss		x	x	x		x	x			
Wf12	Narrow-leaved cotton-grass – Marsh-marigold			xxx							
Wf13	Narrow-leaved cotton-grass – Shore sedge			xx			x				
Wf50	Narrow-leaved cotton-grass – Peat-moss									x	xxx
Wf51	Sitka sedge – Peat-moss				x				xx	xx	
Wf52	Sweet gale – Sitka sedge								xx	xx[s]	
Wf53	Slender sedge – White beak-rush								x	xx[s]	

x = incidental; < 5% of wetlands xx = minor; 5–25% of wetlands xxx = major; >25% of wetlands
i = inland areas only s = southern subzones only

TABLE 5.2.2 *Fen Species Importance Table*

	Species	Wf01	Wf02	Wf03	Wf04	Wf05	Wf06	Wf07	Wf08
Shrubs	*Betula nana*								
	Salix barclayi								
	Salix pedicellaris								
	Spiraea douglasii								
	Myrica gale								
Herbs and Dwarf Shrubs	*Carex utriculata*								
	Carex aquatilis								
	Comarum palustre								
	Calamagrostis canadensis								
	Carex lasiocarpa								
	Menyanthes trifoliata								
	Carex limosa								
	Carex chordorrhiza								
	Eleocharis quinqueflora								
	Trichophorum alpinum								
	Trichophorum cespitosum								
	Eriophorum angustifolium								
	Caltha leptosepala								
	Carex anthoxanthea								
	Equisetum fluviatile								
	Carex magellanica								
	Carex sitchensis								
	Rhynchospora alba								
	Carex livida								
	Eriophorum chamissonis								
	Vahlodea atropurpurea								
	Drosera anglica								
	Hypericum anagalloides								
	Triantha glutinosa								
	Schoenoplectus tabernaemontani								
	Fauria crista-galli								
	Senecio triangularis								
	Andromeda polifolia								
	Kalmia microphylla								
	Oxycoccus oxycoccos								
	Triglochin maritima								
	Drosera rotundifolia								
	Leptarrhena pyrolifolia								
	Platanthera dilatata								
	Sanguisorba canadensis								
	Utricularia intermedia								
	Viola palustris								
Lichens and Mosses	*Sphagnum* Group I								
	Aulacomnium palustre								
	Drepanocladus spp.								
	Sphagnum Group II								
	Tomentypnum nitens								
	Philonotis fontana								
	Calliergon stramineum								
	Scorpidium spp.								
	Campylium stellatum								
	Warnstorfia spp.								
	Meesia triquetra								

Carex aquatilis – Carex utriculata

General Description

The Water sedge – Beaked sedge Fen Site Association is the most common and widespread Fen Site Association in the province. It occurs in all but the warmest and driest subzones from low to subalpine elevations on sites that are annually inundated by shallow, low-energy flood waters and that experience some late-season drawdown. **Wf01** fens are found in a wide variety of landscape positions but most commonly palustrine basins.They occupy wetter zones in larger peatland complexes but also form extensive pure "meadows."

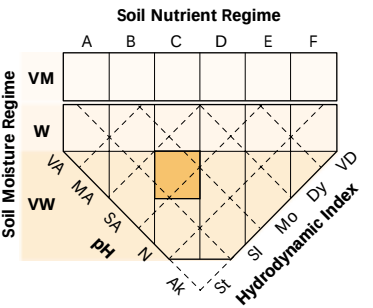
Species diversity is low; *Carex aquatilis* and *Carex utriculata* cover is often continuous, with scattered forbs, aquatics, and mosses in the understorey. On sites that dry out at the surface, *Calamagrostis canadensis* or *C. stricta* can become prominent, species diversity increases, and sites become more meadow-like.

Peat depths range from 30 to > 300 cm. Common soil types include typic and terric Fibrisols and Mesisols. This Site Association tolerates variable hydrology.

Characteristic Vegetation

Tree layer (0 - **0** - 0)
Shrub layer (0 - **0** - 10)
Herb layer (13 - **80** - 100)
Carex aquatilis*, *C. utriculata
Moss layer (0 - **5** - 100)
Drepanocladus aduncus

Wetland Edatopic Grid



Comments

Sites dominated by C. utriculata *and* C. aquatilis *but with mineral or humic soils are described by the* ***Wm01****. Because* ***Wf01*** *and* ***Wm01*** *sites are species-poor and the two dominant sedge species have a wide ecological amplitude, the plant community poorly differentiates between sites on peat (****Wf01****) and those on mineral soil (****Wm01****).* ***Wf01*** *sites typically have less* C. utriculata *and fewer aquatics than* ***Wm01*** *sites. The* ***Wf01*** *develops from the* ***Wm01*** *in most circumstances.*

Sites that are drier or at least have more pronounced microtopography than the ***Wf01*** *are usually occupied by communities with low shrubs and high moss cover (most commonly, the* ***Wf02****). However, at higher elevations few shrubs occur and only moss cover increases (****Wf03****). Sites with greater waterflow are characterized by tall-shrub swamps dominated by willows or alders, and water sedges, and have mineral or humic peat soils.*

TABLE 5.2.1 *Distribution of Fen Site Associations by biogeoclimatic zone*

		BG PP	BWBS SWB	ESSF	ICH	IDF	MS	SBPS SBS	CDF	CWH	MH
Wf01	Water sedge – Beaked sedge		xx	x	xx	xxx	xxx	xxx		x[i]	
Wf02	Scrub birch – Water sedge		xxx	x	xx	xx	xx	xx			
Wf03	Water sedge – Peat-moss			xx				x			
Wf04	Barclay's willow – Water sedge – Glow mosss		x	xxx			x	x			
Wf05	Slender sedge – Common hook-moss		x		xx	xx	xx	xx			
Wf06	Slender sedge – Buckbean		x		x	x		x			
Wf07	Scrub birch – Buckbean – Shore sedge		x		x	x		x			
Wf08	Shore sedge – Buckbean – Hook-moss		x	x		x	x	x			
Wf09	Few-flowered spike-rush – Hook-moss			x			x	x			
Wf10	Hudson Bay clubrush – Red hook-moss							x			
Wf11	Tufted clubrush – Star moss		x	x	x		x	x			
Wf12	Narrow-leaved cotton-grass – Marsh-marigold			xxx							
Wf13	Narrow-leaved cotton-grass – Shore sedge			xx			x				
Wf50	Narrow-leaved cotton-grass – Peat-moss									x	xxx
Wf51	Sitka sedge – Peat-moss				x				xx	xx	
Wf52	Sweet gale – Sitka sedge								xx	xx[s]	
Wf53	Slender sedge – White beak-rush								x	xx[s]	

x = incidental; < 5% of wetlands xx = minor; 5–25% of wetlands xxx = major; >25% of wetlands
i = inland areas only s = southern subzones only

TABLE 5.2.2 *Fen Species Importance Table*

	Species	Wf01	Wf02	Wf03	Wf04	Wf05	Wf06	Wf07	Wf08
Shrubs	*Betula nana*								
	Salix barclayi								
	Salix pedicellaris								
	Spiraea douglasii								
	Myrica gale								
Herbs and Dwarf Shrubs	*Carex utriculata*								
	Carex aquatilis								
	Comarum palustre								
	Calamagrostis canadensis								
	Carex lasiocarpa								
	Menyanthes trifoliata								
	Carex limosa								
	Carex chordorrhiza								
	Eleocharis quinqueflora								
	Trichophorum alpinum								
	Trichophorum cespitosum								
	Eriophorum angustifolium								
	Caltha leptosepala								
	Carex anthoxanthea								
	Equisetum fluviatile								
	Carex magellanica								
	Carex sitchensis								
	Rhynchospora alba								
	Carex livida								
	Eriophorum chamissonis								
	Vahlodea atropurpurea								
	Drosera anglica								
	Hypericum anagalloides								
	Triantha glutinosa								
	Schoenoplectus tabernaemontani								
	Fauria crista-galli								
	Senecio triangularis								
	Andromeda polifolia								
	Kalmia microphylla								
	Oxycoccus oxycoccos								
	Triglochin maritima								
	Drosera rotundifolia								
	Leptarrhena pyrolifolia								
	Platanthera dilatata								
	Sanguisorba canadensis								
	Utricularia intermedia								
	Viola palustris								
Lichens and Mosses	*Sphagnum* Group I								
	Aulacomnium palustre								
	Drepanocladus spp.								
	Sphagnum Group II								
	Tomentypnum nitens								
	Philonotis fontana								
	Calliergon stramineum								
	Scorpidium spp.								
	Campylium stellatum								
	Warnstorfia spp.								
	Meesia triquetra								

Wf09	Wf10	Wf11	Wf12	Wf13	Wf50	Wf51	Wf52	Wf53	Common Name
									scrub birch
									Barclay's willow
									bog willow
									pink spirea
									sweet gale
									beaked sedge
									water sedge
									marsh cinquefoil
									bluejoint reedgrass
									slender sedge
									buckbean
									shore sedge
									cordroot sedge
									few-flowered spike-rush
									Hudson Bay clubrush
									tufted clubrush
									narrow-leaved cotton-grass
									white mtn. marsh-marigold
									yellow-flowered sedge
									swamp horsetail
									poor sedge
									Sitka sedge
									white beak-rush
									pale sedge
									Chamisso's cotton-grass
									mountain hairgrass
									great sundew
									bog St. John's-wort
									sticky asphodel
									great bulrush
									deer-cabbage
									arrow-leaved groundsel
									bog-rosemary
									western bog-laurel
									bog cranberry
									seaside arrow-grass
									round-leaved sundew
									leatherleaf saxifrage
									fragrant white rein orchid
									Sitka burnet
									flat-leaved bladderwort
									marsh violet
									peat-moss Group I
									glow moss
									hook-mosses
									peat-moss Group II
									golden fuzzy fen moss
									spring moss
									straw spear-moss
									sausage-moss
									yellow star-moss
									hook-mosses
									three-ranked hump-moss

Eleocharis quinqueflora – Drepanocladus

General Description

The Few-flowered spike-rush – Hook-moss Fen Site Association occurs on small sloping peatlands at high elevations (mostly above 1200 m) throughout the Sub-Boreal, Central, and Southern Interior. It is rare throughout most of its range, occurring only in slope positions with continual slow surface seepage.

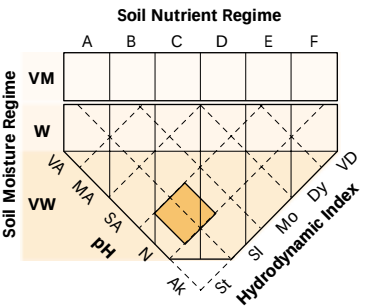
Plant diversity is low; *Eleocharis quinqueflora* is the site dominant, with lesser amounts of *Carex limosa*, *Eriophorum angustifolium*, and other forbs occasionally occurring. Hook-mosses such as *Homatocaulis vernicosus*, *Scorpidium revolvens*, and *Drepanocladus aduncus* usually comprise the moss layer but other brown mosses such as *Meesia triquetra* and *Tomentypnum nitens* can occur in high abundance.

Peat forms as a characteristically dense and tenacious mesic peat. Peat depths are frequently shallow but can be up to 2 m. Terric Mesisols and Humisols are common soil types.

Characteristic Vegetation

Tree layer (0 - **0** - 0)
Shrub layer (0 - **.5** - 10)
Herb layer (30 - **60** - 100)
Carex limosa, ***Eleocharis quinqueflora***, *Eriophorum angustifolium*
Moss layer (1 - **50** - 95)
***Drepanocladus* spp.**, *Tomentypnum nitens*

Wetland Edatopic Grid



Comments

*The **Wf09** unit is similar in structure and hydroedatopic position to the **Wf11** of lower elevations. **Wf09** commonly occurs without adjacent wetland Site Associations or in complex with cotton-grass fens (**Wf12** or **Wf13**).*
The tenacious peat of this unit is typically of similar composition throughout the profile, suggesting that this ecosystem can be stable and long-lived.

*Peat is sufficiently dense on **Wf09** sites that soil water movements are impeded and most waterflow is at the surface as sheet flow. The specific conditions that give rise to the **Wf09** rather than other high-elevation fens are not well understood but may be partly initiated and maintained by the dense stems and roots of* Eleocharis quinqueflora.

TABLE 5.2.1 *Distribution of Fen Site Associations by biogeoclimatic zone*

		BG PP	BWBS SWB	ESSF	ICH	IDF	MS	SBPS SBS	CDF	CWH	MH
Wf01	Water sedge – Beaked sedge		xx	x	xx	xxx	xxx	xxx		x[i]	
Wf02	Scrub birch – Water sedge		xxx	x	xx	xx	xx	xx			
Wf03	Water sedge – Peat-moss			xx				x			
Wf04	Barclay's willow – Water sedge – Glow mosss		x	xxx			x	x			
Wf05	Slender sedge – Common hook-moss		x		xx	xx	xx	xx			
Wf06	Slender sedge – Buckbean		x		x	x		x			
Wf07	Scrub birch – Buckbean – Shore sedge		x		x	x		x			
Wf08	Shore sedge – Buckbean – Hook-moss		x	x		x	x	x			
Wf09	Few-flowered spike-rush – Hook-moss			x			x	x			
Wf10	Hudson Bay clubrush – Red hook-moss							x			
Wf11	Tufted clubrush – Star moss		x	x	x		x	x			
Wf12	Narrow-leaved cotton-grass – Marsh-marigold			xxx							
Wf13	Narrow-leaved cotton-grass – Shore sedge			xx			x				
Wf50	Narrow-leaved cotton-grass – Peat-moss									x	xxx
Wf51	Sitka sedge – Peat-moss				x				xx	xx	
Wf52	Sweet gale – Sitka sedge								xx	xx[s]	
Wf53	Slender sedge – White beak-rush								x	xx[s]	

x = incidental; < 5% of wetlands xx = minor; 5–25% of wetlands xxx = major; >25% of wetlands
i = inland areas only s = southern subzones only

TABLE 5.2.2 *Fen Species Importance Table*

	Species	Wf01	Wf02	Wf03	Wf04	Wf05	Wf06	Wf07	Wf08
Shrubs	*Betula nana*								
	Salix barclayi								
	Salix pedicellaris								
	Spiraea douglasii								
	Myrica gale								
Herbs and Dwarf Shrubs	*Carex utriculata*								
	Carex aquatilis								
	Comarum palustre								
	Calamagrostis canadensis								
	Carex lasiocarpa								
	Menyanthes trifoliata								
	Carex limosa								
	Carex chordorrhiza								
	Eleocharis quinqueflora								
	Trichophorum alpinum								
	Trichophorum cespitosum								
	Eriophorum angustifolium								
	Caltha leptosepala								
	Carex anthoxanthea								
	Equisetum fluviatile								
	Carex magellanica								
	Carex sitchensis								
	Rhynchospora alba								
	Carex livida								
	Eriophorum chamissonis								
	Vahlodea atropurpurea								
	Drosera anglica								
	Hypericum anagalloides								
	Triantha glutinosa								
	Schoenoplectus tabernaemontani								
	Fauria crista-galli								
	Senecio triangularis								
	Andromeda polifolia								
	Kalmia microphylla								
	Oxycoccus oxycoccos								
	Triglochin maritima								
	Drosera rotundifolia								
	Leptarrhena pyrolifolia								
	Platanthera dilatata								
	Sanguisorba canadensis								
	Utricularia intermedia								
	Viola palustris								
Lichens and Mosses	*Sphagnum* Group I								
	Aulacomnium palustre								
	Drepanocladus spp.								
	Sphagnum Group II								
	Tomentypnum nitens								
	Philonotis fontana								
	Calliergon stramineum								
	Scorpidium spp.								
	Campylium stellatum								
	Warnstorfia spp.								
	Meesia triquetra								

General Description

The Shore sedge – Buckbean – Hook-moss is an uncommon, rich Fen Site Association that occurs mainly at higher elevations throughout the Interior (700–1800 m) in colder subzones. These fens occur on pond-side floating mats or in flarks of patterned fens where there is prolonged shallow flooding to no more than several centimetres.

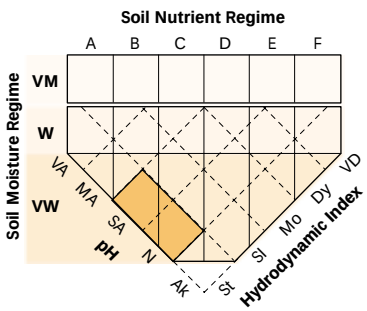
Carex limosa rooted in shallow water is the constant dominant on these sites. *Menyanthes trifoliata* occurs on most sites but can be very sparse or absent on some. A diversity of species tolerant of permanent saturation such as *Carex chordorrhiza*, *Equisetum fluviatile*, and *Andromeda polifolia* commonly occur with low cover.

Peat deposits are shallow (0.5 m) to very deep (> 6 m), fibric or mesic, and derived from fine sedges and brown mosses. Fibrisols are the most common soil type.

Characteristic Vegetation

Tree layer (0 - **0** - 0)
Shrub layer (0 - **.5** - 10)
Herb layer (14 - **35** - 100)
C. limosa*, *Menyanthes trifoliata
Moss layer (1 - **85** - 100)
Drepanocladus spp.

Wetland Edatopic Grid



Comments

*This is the most common and dominant Site Association in patterned fens. In weakly patterned fens, the **Wf08** occurs over ribs and flarks. Where there is a more pronounced rib/flark pattern, the **Wf08** will typically occur in flarks and the floristically similar, shrubby **Wf07** on elevated ribs.*

*The **Wf06** occurs on wetter and more hydrologically dynamic sites than the **Wf08**. Similarly stagnant sites with acidic soil water are occupied by the **Wb13**. The **Wf08** has similar hydrology to the **Wf09** and **Wf10**, but with more mobile groundwater and greater degree of surface flooding. **Wf08** sites may become **Wb13** sites in some circumstances.*
Peat deposits are often consistent throughout the profile, and peat core contents of fine sedge and brown mosses are readily identifiable. This suggests that these ecosystems can be stable and long-lived.