

TABLE 8 Environmental characteristics of IDF subzones and variants in the Cariboo Forest Region

	IDFxw	IDFxm	IDFdk1	IDFdk3	IDFdk4	IDFdw	IDFmw
Area (km ²)	362	2373	20	8953	3994	1009	147
Elevation (m)	600–1000	800–1200	800–1350	750–1200	1050– 1350	1050– 1400	760–900
Climate							
Precipitation (mm)	no data						
Mean annual		392	386	433	355	412	494
Mean summer		203	191	207	171	134	195
Mean winter		190	195	226	213	278	300
Mean annual snowfall (cm)		145	116	231	138	142	153
Temperature (°C)							
Mean annual	3.5	4.0	5.4	3.3	2.8	3.9	7.2
Mean warmest month	15.4	16.0	17.3	14.7	13.6	14.0	18.8
Mean coldest month	-10.2	-11.0	-10.2	-10.3	-10.3	-8.5	-5.4
Frost-free days		163	180	151	122	148	211
Soils							
Zonal soils ^a	O.G.L.	O.G.L.	O.G.L.	O.G.L.	O.G.L.	Br.G.L.	Br.G.L.
Zonal humus form ^b	HR	HR	HR	HR	HR	HR	HR

^aO.G.L. = Orthic Gray Luvisol; Br.G.L. = Brunisolic Gray Luvisol

^bHR = HemiMor

TABLE 9 IDF vegetation table - zonal sites^a

	Biogeoclimatic Unit	IDF xw	IDF xm	IDF dk3	IDF dk4	IDF dw	
Tree Layer	<i>Pinus ponderosa</i>	■■■					Ponderosa pine
	<i>Pseudotsuga menziesii</i>	■■■■	■■■■	■■■■	■■■■	■■■■	Douglas-fir
	<i>Populus tremuloides</i>					■	trembling aspen
	<i>Pinus contorta</i>			■■■	■■■		lodgepole pine
Shrub Layer	<i>Juniperus communis</i>	■					common juniper
	<i>Symphoricarpos albus</i>		■■■				common snowberry
	<i>Rosa acicularis</i>	■■	■■■	■■■	■■■	■■■	prickly rose
	<i>Shepherdia canadensis</i>	■■■		■■■	■■■	■■■	soopolallie
	<i>Spiraea betulifolia</i>		■	■	■	■■■	birch-leaved spirea
Herb Layer	<i>Balsamorhiza sagittata</i>	■■■					arrow-leaved balsamroot
	<i>Sedum lanceolatum</i>	■■■					lance-leaved stoncrop
	<i>Elymus spicatus</i>	■■■■	■				blucbunch wheatgrass
	<i>Allium cernuum</i>	■■■					nodding onion
	<i>Antennaria</i> spp.	■■■					pusseytoes
	<i>Achillea millefolium</i>	■■■	■■■		■■■	■	yarrow
	<i>Lithospermum ruderale</i>	■■■	■■■				lemonweed
	<i>Astragalus miser</i>	■■■	■■■		■■■	■	timber milk-vetch
	<i>Arctostaphylos uva-ursi</i>	■■■	■■■	■■■	■■■■	■■■	kinnikinnick
	<i>Aster conspicuus</i>	■■■	■■■	■■■	■■■	■■■	showy aster
	<i>Calamagrostis rubescens</i>	■■■■	■■■■	■■■■	■■■■	■■■	pinegrass
	<i>Fragaria virginiana</i>	■■■	■■■	■■■	■■■	■■■	wild strawberry
	<i>Galium boreale</i>	■■■	■■■	■			northern bedstraw
	<i>Carex concinoides</i>	■■■		■■■	■	■	northwestern sedge
	<i>Goodyera oblongifolia</i>			■■■			rattlesnake-plantain
	<i>Vaccinium caespitosum</i>			■■■			dwarf blueberry
	<i>Orthilia secunda</i>			■■■			one-sided wintergreen
	<i>Pyrola chlorantha</i>			■■■			green wintergreen
	<i>Epilobium angustifolium</i>			■■■	■		fireweed
	<i>Linnaea borealis</i>			■■■	■■■		twinflower
<i>Arnica cordifolia</i>			■■■	■	■■■	heart-leaved arnica	
<i>Disporum trachycarpum</i>					■	rough-fruited fairybells	
Moss Layer	<i>Dicranum polysetum</i>	■	■■■	■■■	■■■		wavy-leaved moss
	<i>Cladonia</i> spp.	■■■	■■■	■■■	■■■	■■■	cladonia lichens
	<i>Peltigera</i> spp.	■■■	■■■	■■■	■■■	■■■	pelt lichens
	<i>Pleurozium schreberi</i>		■■■■	■■■■	■■■■	■	red-stemmed feathermoss
	<i>Hylocomium splendens</i>		■	■■■	■■■		step moss
	<i>Peltigera aphthosa</i>			■■■	■■■		freckle pelt
	<i>Cladina</i> spp.		■■■	■	■■■		reindeer lichens

^aData are for zonal sites only; IDFdk1 and IDFmw not included due to no data from Cariboo Forest Region.

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%

IDFxm Subzone The IDFxm is the driest subzone of the IDF north of Chasm. It is a moderate-sized subzone (2373 km²) that occurs entirely within the Cariboo Forest Region, largely within the valleys of the Fraser and Chilcotin rivers. The IDFxm occurs just above the BG Zone and represents a transition between this grassland zone and the more continuous forests at higher elevations (IDFdk). Much of the IDFxm is a parkland of grasslands, aspen groves, and Douglas-fir forests. In some areas, grasslands cover more than 50% of the landscape. These grasslands are distinguished from those of the BG Zone by the presence of Rocky Mountain fescue, porcupine grass, and spreading needlegrass on zonal sites. Several grassland species occur in the IDFxm forest.

Mature forests on zonal sites in the IDFxm are dominated by relatively short (15–23 m tall) Douglas-fir. In contrast to other subzones of the IDF, no other tree species, other than occasional trembling aspen, are common on zonal sites. (Lodgepole pine occurs on some mesic sites near the IDFdk boundary and where cold air accumulates.) Tree regeneration on zonal sites is entirely Douglas-fir and is often sparse. The undergrowth is dominated by a sparse to moderate cover of grasses, with the principal species being pinegrass. Bluebunch wheatgrass and spreading needlegrass are often present. In contrast to the IDFdk and IDFmw, twinflower is not present on zonal sites and moss cover is relatively sparse and patchy.

IDFdk Subzone The IDFdk is by far the largest subzone (about 12 967 km²) of the IDF in the Cariboo Forest Region. It occurs on the level to gently rolling plateau landscapes above the valleys of the Fraser, Chilcotin, and Chilanko rivers. The IDFdk extends about as far north as Williams Lake and as far west as Tatla Lake. It has the coldest climate of the five IDF subzones in the Cariboo Forest Region.

Climax forests on zonal sites of the IDFdk typically have a multi-aged Douglas-fir–dominated canopy, abundant Douglas-fir regeneration with a very patchy distribution, and a pinegrass-dominated undergrowth. Douglas-fir trees usually include scattered large “vets” that have survived previous wildfires. Lodgepole pine, the principal seral species in the IDFdk, is usually present in the forest canopy, while trembling aspen and white birch are occasionally present. The undergrowth typically includes a few scattered shrubs, especially soopolallie, prickly rose, and birch-leaved spirea. In contrast to the IDFxw and IDFxm, twinflower is common.

IDFxm

INTERIOR DOUGLAS-FIR VERY DRY MILD SUBZONE

The IDFxm occurs primarily in the Fraser and Chilcotin river valleys south of about Alexandria and east of Redstone, respectively. In the Fraser River valley, south of the confluence with the Chilcotin River, it occurs on middle and upper valley slopes. North of the confluence with the Chilcotin River, it includes lower valley slopes as well. In the Chilcotin River valley it occurs on middle and upper valley slopes near the Fraser River but includes all valley slopes near Alexis Creek. Further west towards Redstone, it is increasingly restricted to lower valley slopes. Elevations are generally 800–1200 m and occasionally as high as 1200 m.

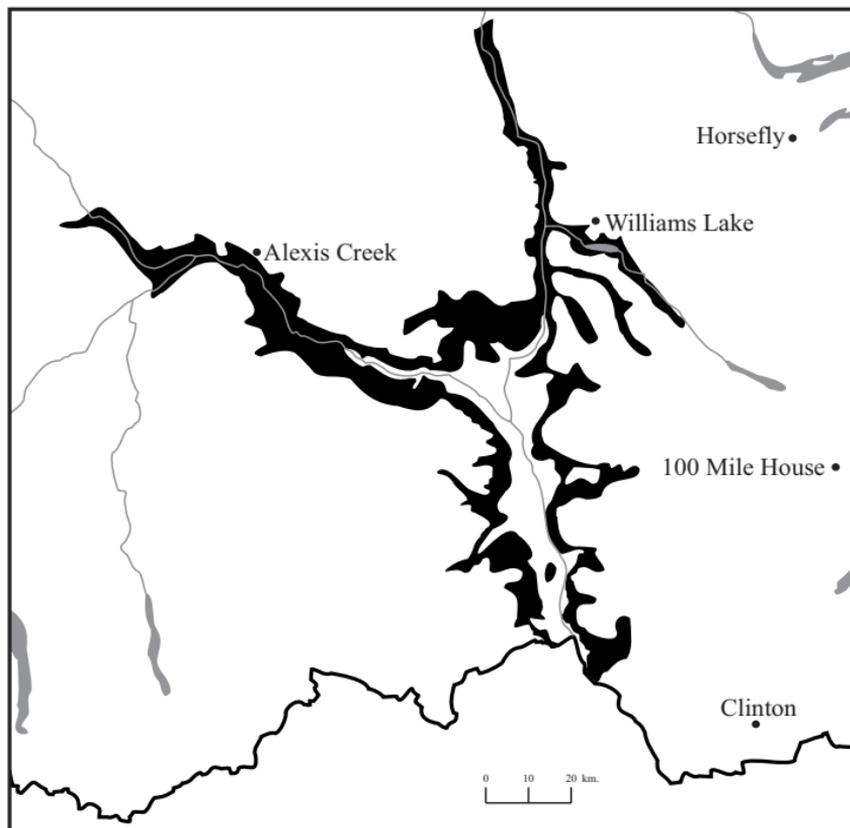
Distinguishing Adjacent Units from the IDFxm

The **IDFdk3** occurs at higher elevations along the east side of the Fraser River valley. North of the confluence of the Fraser and Chilcotin rivers, it also occurs above the IDFxm along the west side of the Fraser River. The **IDFdk4** occurs at higher elevations along the west side of the Fraser River Valley south of the Chilcotin River confluence. It also occurs above the IDFxm along both sides of the Chilcotin River valley. The **SBSdw2** occurs at higher elevations along the Fraser River valley at the northernmost limits of the IDFxm, north of Macalister. The **IDFxm** occurs at similar elevations south of Big Bar Creek, along the west side of the Edge Hills where the climate is warmer and drier. The **SBSmh** occurs at similar elevations in the Fraser River valley north of about Alexandria. The **BGxw2** occurs below the IDFxm on middle and some lower valley slopes of the Fraser and Chilcotin river valleys.

In the **IDFdk3** and the **IDFdk4**, zonal sites have:

- lodgepole pine (also present in IDFxm on some level and gently sloping areas near IDFdk boundary);
- twinflower;
- no bluebunch wheatgrass, spreading needlegrass, Rocky Mountain juniper, or arrow-leaved balsamroot.

Distribution of IDFx_m Subzone in the Cariboo Forest Region



In the **IDF_{xw}**, zonal sites have:

- ponderosa pine;
- little or no common snowberry;
- greater abundance of bluebunch wheatgrass.

In the **SBS_{dw2}**, zonal sites have:

- lodgepole pine and hybrid white spruce;
- twinflower, bunchberry, and black twinberry.

In the **SBS_{mh}**, zonal sites have:

- hybrid white spruce;
- bunchberry and red-osier dogwood.

In the **BG_{xw2}**, zonal sites have:

- grasslands, not forests, as climax vegetation;
- no pinegrass.

Site Units of the IDFxm

The site series classification described here does not include the small forest patches that occur within a grassland matrix in the forest/grassland parklands of the IDFxm. These parklands are most extensive on Becher's Prairie.

Zonal Site Series 01 Fd - Pinegrass - Feathermoss Site Series is the most extensive site series of the IDFxm, occupying in the order of 30–40% of the landscape. Sites are generally level to moderately sloping, with medium-textured soils. Douglas-fir dominates the forest canopy and tree regeneration layers of nearly all stands. Small trembling aspen stands occur occasionally within the Douglas-fir forest matrix and at the transition between these forests and the many grasslands that occur within the IDFxm. The Douglas-fir stands have a moderately closed canopy and are single- to multi-storied, depending in part on the history of wildfires that have destroyed small but not larger stems. Tree regeneration is generally less dense than in the IDFdk. The undergrowth contains a sparse to moderate cover of shrubs, several grass species (some are also common in the open grasslands), and several low-growing, dry-land forb species. Moss cover is typically patchy. Most sites in this series are included in the /01a Typic Phase.

01b Cold Phase occurs locally in the Chilcotin River valley on sites that meet all criteria for zonal sites except that they are cold air

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accumulation sites. They typically occur on level benches and shallow depressions on mid to lower valley slopes. They are small, uncommon, and distinguished by a lodgepole pine–dominated canopy. Lichens are usually more abundant than in the Typic Phase of the /01 Site Series.

Drier Sites Sites drier than the zonal sites are very common, occurring primarily on steep valley slopes and on gentle slopes with sandy soils. Compared to zonal sites, forests on these sites have a more open canopy, fewer herbaceous species, and less moss cover. Bluebunch wheatgrass is a principal species of the undergrowth. Grasslands are common on these sites.

02 Fd - Bluebunch wheatgrass - Penstemon Site Series occurs on moderate to steep (>25%) south- or west-facing slopes with sandy soils (/02a - Typic Phase), and also on ridge and hill crests with shallow soils over bedrock (/02b - Shallow Phase). These are very dry sites with slow tree growth. The forest canopy is characterized by patches or clumps of multi-sized Douglas-fir stems. Open shrub- or grass-dominated areas occur between the clumps. Tree regeneration is typically sparse and occurs primarily in the shade (but not in the “rainshadow” directly beneath the canopy) of larger trees. The undergrowth is relatively sparse and dominated by shrubs and bluebunch wheatgrass. The forest floor is discontinuous and much of the surface is exposed mineral soil.

03 Fd - Juniper - Cladonia Site Series includes level to gently sloping sites with sandy soils of glaciofluvial origin. In contrast to other IDFXm site series, lodgepole pine is common and typically dominates the forest canopy. Douglas-fir is the principal species of tree regeneration but lodgepole pine stems are usually present below the frequent canopy gaps. The undergrowth is dominated by kinnikinnick, common juniper, and lichens. Grasses are always present but not abundant. These sites are relatively uncommon. Abundant lodgepole pine and kinnikinnick and relatively little grass cover distinguishes mature vegetation of these sites.

04 Fd - Bluebunch wheatgrass - Pasture sage Site Series occurs on moderate and steep (>25%) south- and west-facing slopes with medium- to fine-textured soils. These are relatively hot, very dry sites, and they are common. Tree cover is patchy, consisting of multi-sized Douglas-fir and occasional trembling aspen. Tree regeneration is

sparse and primarily in the partial shade of larger trees. The undergrowth is dominated by shrubs, including Rocky Mountain juniper and saskatoon, and bluebunch wheatgrass. Shrub and grass cover is greater than in the /02 site series. The forest floor is dry and discontinuous and much of the surface is exposed mineral soil.

05 Fd - Feathermoss - Stepmoss Site Series occurs on steep (>35%) north- and east-facing slopes. The mature forest canopy is dominated by Douglas-fir and moderately closed. Tree regeneration is more dense than in the /02, /03, and /04 site series. The undergrowth is dominated by a carpet of mosses, primarily stepmoss and red-stemmed feathermoss, which distinguishes these from other IDFxm sites. Several vascular plant species are typically present but their cover is low. Principal shrubs are birch-leaved spirea and prickly rose, while common herbaceous species include bluebunch wheatgrass, pinegrass, and showy aster.

Wetter Sites Sites wetter than the zonal sites are relatively uncommon and small. They occur primarily on valley floors, in small depressions, and as a narrow band at the base of north- and east-facing slopes. The presence of spruce, twinflower, wild sarsaparilla, rough-leaved ricegrass, or common mitrewort distinguishes these from zonal and drier sites.

06 Fd - Ricegrass - Feathermoss Site Series includes sites only slightly more moist than zonal sites. They occur at the base of short slopes where seepage volumes are small and infrequent, and in shallow depressions on level to gently sloping areas. The forest canopy is moderately closed and, as a result, the density of stems in tree regeneration layers is usually less than on zonal sites. The undergrowth is typically dominated by prickly rose, rough-leaved ricegrass, twinflower, and pinegrass. Mosses cover most of the soil surface.

07 Fd - Prickly rose - Sarsaparilla Site Series includes moist sites only slightly wetter than /06 sites. They occur primarily at the base of longer north-facing slopes where seepage water is present following spring snowmelt and after heavy summer rains but not during most of the growing season. The Douglas-fir-dominated forest canopy is

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moderately closed and often contains paper birch. The sparse to moderately dense tree regeneration is primarily Douglas-fir, often with some paper birch. The undergrowth is characterized by a moderate density of shrubs and several moist-site forbs. The abundance of Douglas maple, northern gooseberry, violets, and wild sarsaparilla distinguishes these sites from the /06 site series.

08 Sxw - Snowberry - Prickly rose Site Series occurs on moist to wet, lower and toe slope sites that receive seepage water during most of the growing season. They are often associated with intermittent or permanent streams. The forest canopy is moderately closed and dominated by hybrid white spruce. The undergrowth includes a moderate cover of shrubs, including common snowberry and black twinberry, and several moist- to wet-site forbs such as twinflower, star-flowered false Solomon's-seal, and sweet-scented bedstraw. The moss layer is dominated by red-stemmed feathermoss and step moss but, in contrast to drier sites, leafy mosses are also present.

09 Sxw - Horsetail Site Series includes the wettest forested sites of the IDFxm. They occur at the toe of slopes and in depressions where a water table is near the surface. These sites often occur at the edge of non-forested wetlands and on low terraces of larger streams. The forest canopy is dominated by hybrid white spruce and is often patchy. The undergrowth is shrubby and contains several moist- to wet-site herbaceous species such as common horsetail, common mitrewort, and trailing raspberry. Abundant horsetail distinguishes the vegetation of these sites.

Non-forested Sites Grasslands are common and often extensive in the IDFxm. On gently sloping mesic sites, these grasslands are dominated by porcupine grass and spreading needlegrass. On cool north aspects and near the forest edge, spreading needlegrass is dominant. Bluebunch wheatgrass is abundant on gently to steeply sloping south and west

aspects. Wetlands are generally uncommon on the IDFxm landscape due to the dry climate and prevalence of sloping terrain but are locally common on Becher's Prairie, an area of gently sloping terrain near the upper elevation limits of the IDFxm. Marshes and shallow open water are the most common wetland type. The IDFxm also includes numerous bedrock cliffs, gravel and silt cliffs, talus slopes, and associated features characteristic of incised valley terrain.

Key to Site Units of the IDFxm

1a. Moisture regime mesic or drier; bluebunch wheatgrass, spike-like goldenrod, common juniper, or cladonia lichens present; hybrid white spruce, paper birch, sweet-scented bedstraw, common mitrewort, black twinberry, rough-leaved ricegrass, and horsetails absent.

2a. Soils <30 cm over bedrock, bedrock usually exposed; slope position crest or upper.

**IDFxm/02 Fd - Bluebunch wheatgrass -
Penstemon; /02b Shallow Phase**

2b. Soils deeper, bedrock not exposed, slope position generally upper to depression or level.

3a. Slope aspect SE, S, SW, or W **and** slope gradient >25%; feathermosses usually absent.

5a. Soil texture sand or loamy sand; shrubby penstemon usually present and pasture sage absent.

**IDFxm/02 Fd - Bluebunch wheatgrass -
Penstemon; /02a Typic Phase**

5b. Soil texture not sand; pasture sage usually present and shrubby penstemon absent.

**IDFxm/04 Fd - Bluebunch wheatgrass -
Pasture sage**

3b Slope aspect NW, N, NE, or E **or** slope gradient <25%; feathermosses usually present.

4a. Slope >35% **and** slope aspect NW, N, NE, or E; feathermosses, especially step moss and red-stemmed feathermoss, have combined cover >50%.

IDFxm/05 Fd - Feathermoss - Step moss

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4b. Slope gradient <35%, slope aspect various; feathermoss combined cover generally <50%.

6a. Soil texture sand or loamy sand; kinnikinnick cover >15%; forest canopy dominated by lodgepole pine; showy aster and red-stemmed feathermoss absent or incidental.

IDFxm/03 Fd - Juniper - Cladonia

6b. Soil texture not sand or loamy sand; kinnikinnick cover usually <5%; forest canopy dominated by Douglas-fir or infrequently by lodgepole pine; showy aster and red-stemmed feathermoss present.

7a. Forest canopy dominated by Douglas-fir; cold air drained from site.

IDFxm/01 Fd - Pinegrass - Feathermoss; /01a Typic Phase

7b. Forest canopy dominated by lodgepole pine; site in cold air accumulation area or on level to very gently sloping area with poor cold air drainage.

IDFxm/01 Fd - Pinegrass - Feathermoss; /01b Cold Phase

1b. Moisture regime subhygric or wetter; hybrid white spruce, paper birch, sweet-scented bedstraw, common mitrewort, black twinberry, rough-leaved ricegrass, or horsetails usually present; bluebunch wheatgrass, spike-like goldenrod, common juniper, and cladonia lichens usually absent.

7a. Soils not prominently mottled or gleyed, and persistent seepage water or water table not present within 1m of surface; common horsetail, black twinberry, and star-flowered false Solomon's-seal absent.

8a. Douglas maple and rough-fruited fairybells present; field pussytoes and sweet-scented bedstraw absent; sites generally at base of long north- or east-facing slopes.

IDFxm/07 Fd - Prickly rose - Sarsaparilla

- 8b. Douglas maple and rough-fruited fairybells absent; field pussytoes and sweet-scented bedstraw present; sites generally at base of short slopes or in shallow depressions on level or mid slope positions.

IDFxm/06 Fd - Ricegrass - Feathermoss

- 7b. Soils prominently mottled or gleyed, and free water persistent within 100 cm of surface; common horsetail, black twinberry, or star-flowered false Solomon's-seal present.

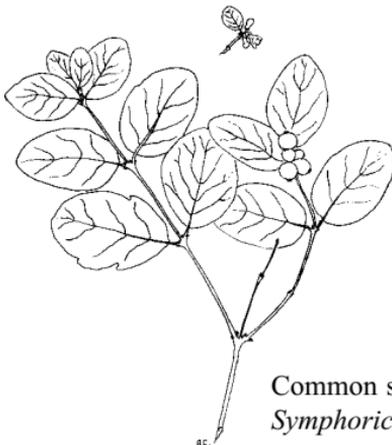
- 9a. Common horsetail sparse (<5% cover); slope position mostly lower or toe; water table generally not present within 50 cm of surface; often adjacent to streams.

IDFxm/08 Sxw - Snowberry - Prickly rose

- 9b. Common horsetail cover usually >20%; slope position mostly toe or depression; water table often present within 50 cm of surface.

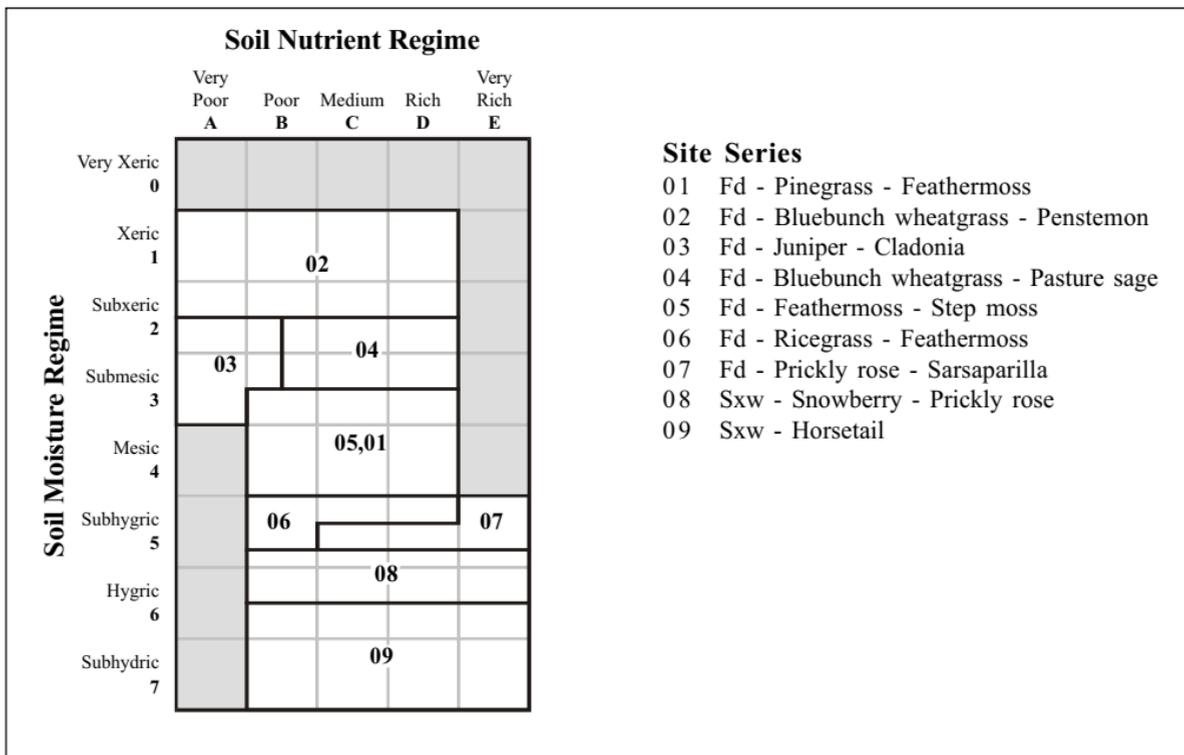
IDFxm/09 Sxw - Horsetail

Lemonweed
Lithospermum ruderale



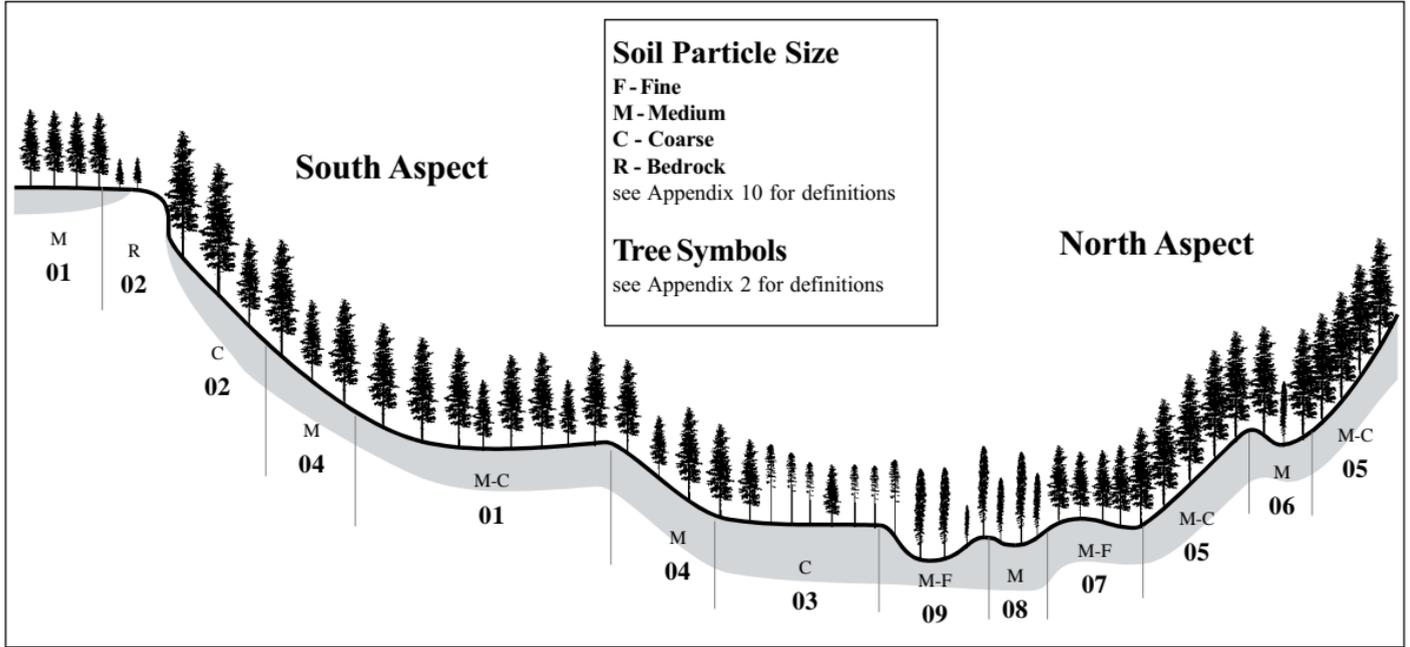
Common snowberry
Symphoricarpos albus

IDFxm Edatopic Grid



IDFxm Landscape Profile

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Site Features of IDFXm Site Series

Site Series	01	02	03	04	05
Key Features	zonal and other mesic and near-mesic sites on level sites, gentle S to W aspects and gentle to steep N to E aspects	moderate to steep SE- to W- facing slopes with sandy soils; also shallow (< 50 cm) soils over bedrock on crests and upper slopes	level to gentle slopes with sandy, gravelly soils; usually on glaciofluvial terraces	moderate to steep SE-, S-, SW-, and W- facing slopes with loamy, silty, or clayey soils	steep (> 35%) NW, N, NE, or E slope aspects; soils variable
Soil Moisture / Nutrient Regimes	submesic, mesic / poor - rich	xeric, subxeric / very poor - rich	subxeric, submesic / very poor, poor	subxeric, submesic / poor - rich	submesic, mesic / poor - rich
Slope Position	mid, level	crest, upper, mid	level, mid, toe	upper, mid	upper, mid, lower
Aspect	all	all on thin soils; SE - W on deep soils	none	SE, S, SW, or W	NW, N, NE, E
Slope Grade (%)	0 - 35 (generally not > 20 on south aspects)	0 - 15 on thin soils; > 25 on deep soils	0 - 10	> 25	> 35
Soil Texture	loamy	loamy	gravelly sandy	loamy	mostly loamy
Humus Form and Thickness (cm)	Mormoder, Rhizomull 2 - 5	Rhizomull, Xeromoder 0 - 4	Hemimor, Xeromor 0 - 4	Xeromor, Rhizomull 0 - 2	Hemimor 2 - 5
Occurrence / Size / Distribution	very common / medium / wide	common / small / wide	uncommon / small / wide	common / moderate / wide	common / moderate / wide

Site Features of IDFxM Site Series (continued)

Site Series	06	07	08	09
Key Features	lower slope sites and small, shallow depressions at the base of short slopes; soils not gleyed or prominently mottled	moist lower and toe slope positions at the base of N- or E-facing slopes; evidence of intermittent seepage	moist to wet sites receiving seepage during most of growing season; free water within 100 cm of surface; often adjacent to stream channel	wet toe slope positions and depressions; free water usually present within 50 cm of surface during growing season
Soil Moisture / Nutrient Regimes	subhygric / poor - rich	subhygric / medium - very rich	subhygric, hygric / poor - very rich	hygric, subhydric / poor - very rich
Slope Position	lower, depression	lower, toe	lower, toe	toe, depression
Aspect	all, but mostly NW, N, NE, or E	NW, N, NE, E	all but mostly NW, N, NE, or E	none
Slope Grade (%)	0 - 20	0 - 60	0 - 5 (25)	0 - 5
Soil Texture	mostly loamy	loamy	loamy, sandy, or silty	loamy, silty, or organic
Humus Form and Thickness (cm)	Hemimor 2 - 6	Hemimor, Mormoder 3 - 6	Hemimor, Mormoder 5 - 12	Hemimor, Hydromor 8 - 40
Occurrence / Size / Distribution	uncommon / small / wide	uncommon / small / wide	common / small / wide	uncommon / small / wide

IDFxm Vegetation Table^a

	Site Unit	02	03	04	05	01	06	07	08	09	
Tree Layer	<i>Pinus contorta</i>		■■■								lodgepole pine
	<i>Pseudotsuga menziesii</i>	■■■■	■	■■■■	■■■■	■■■■	■■■■	■■■■			Douglas-fir
	<i>Betula papyrifera</i>							■■■			paper birch
	<i>Picea engelmannii</i> x <i>glauca</i>						■		■■■■	■■■■	hybrid white spruce
Shrub Layer	<i>Juniperus scopulorum</i>	■■	■	■■	■	■					Rocky Mountain juniper
	<i>Juniperus communis</i>	■	■■■	■	■						common juniper
	<i>Amelanchier alnifolia</i>	■■	■	■		■	■	■■			saskatoon
	<i>Spiraea betulifolia</i>				■■■	■		■■■			birch-leaved spirea
	<i>Rosa acicularis</i>	■	■■■	■	■	■■■	■■■	■■■	■■■	■■■	prickly rose
	<i>Symphoricarpos albus</i>	■		■	■	■	■	■	■	■	common snowberry
	<i>Mahonia aquifolium</i>						■	■			tall Oregon-grape
	<i>Lonicera involucrata</i>								■■	■■	black twinberry
	<i>Cornus stolonifera</i>								■	■■	red-osier dogwood
Herb Layer	<i>Penstemon fruticosus</i>	■■	■			■					shrubby penstemon
	<i>Solidago spathulata</i>	■■	■■	■■							spike-like goldenrod
	<i>Elymus spicatus</i>	■■■	■■■	■■■■	■■■	■					bluebunch wheatgrass
	<i>Allium cernuum</i>		■■	■	■						nodding onion
	<i>Stipa richardsonii</i>		■■■			■					spreading needlegrass
	<i>Arctostaphylos uva-ursi</i>		■■■			■	■				kinnikinnick
	<i>Calamagrostis rubescens</i>		■			■■	■■■	■■	■■■	■	pinegrass
	<i>Lithospermum ruderale</i>			■■		■					lemonweed
	<i>Heuchera cylindrica</i>				■■						round-leaved alumroot
	<i>Aster conspicuus</i>				■■■	■■		■■			showy aster
	<i>Aster ciliolatus</i>			■		■		■■	■■	■■	fringed aster
	<i>Disporum trachycarpum</i>				■			■■			rough-fruited fairybells
	<i>Aralia nudicaulis</i>						■■	■■			wild sarsaparilla
	<i>Oryzopsis asperifolia</i>						■■■■	■■			rough-leaved ricegrass
	<i>Linnaea borealis</i>						■■		■■■	■■	twinflower
	<i>Mitella nuda</i>						■		■	■■	common mitrewort
	<i>Smilacina stellata</i>								■■	■■■	star-flowered false Solomon's-seal
<i>Rubus pubescens</i>								■	■■■	trailing raspberry	
<i>Equisetum arvense</i>								■	■■■■	common horsetail	
Moss Layer	<i>Tortula ruralis</i>	■■		■■							sidewalk moss
	<i>Cladonia</i> spp.	■■	■■■			■■					cladonia lichens
	<i>Peltigera</i> spp.	■	■■■	■	■■	■■	■	■			pelt lichens
	<i>Dicranum polysetum</i>				■	■■	■■				wavy-leaved moss
	<i>Pleurozium schreberi</i>				■■■■	■■■■	■■■■	■■	■■■	■	red-stemmed feathermoss
	<i>Hylacomium splendens</i>				■■■■	■	■■■	■■■■	■	■	step moss
	<i>Brachythecium</i> spp.						■■		■		ragged mosses
<i>Mnium</i> 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%

IDFxm Silviculture Considerations

Silviculture Practices and Options

Predominant silviculture system Commercial timber harvesting has not been extensive on Crown land in the IDFxm, since much of the area is on steep valley slopes and timber production is relatively low. Where commercial harvesting has occurred on Crown land it has primarily been a faller selection system similar to that in the IDFdk. As in the IDFdk, stand regeneration is primarily by release of advance regeneration and natural regeneration ingress. Plantation success is generally poor. Advance regeneration densities are typically much lower than in the IDFdk3 and spacing is less important. Stocking voids are more common. Salvage of trees killed by Douglas-fir beetle has occurred locally. Harvesting on private land has been primarily diameter-limit harvesting or clearcutting.

Advance regeneration is virtually all Fd but is generally much less dense than in the IDFdk3. These much lower densities are probably the result of the drier climate and resulting drier soils. Advance regeneration densities have probably increased following wildfire control, but only slowly. Due to the drier soils, below-ground competition probably reduces growth at lower stem densities. Advance Fd regeneration is generally of good form and vigour, and its growth responds well to canopy opening. Growth generally increases with increasing sunlight, although stems with thin, non-furrowed bark often suffer sunscald when exposed to sunlight after growing in shade.

Natural restocking is the normal regeneration method in the IDFxm. Survival of planted Fd on cleared areas has generally been poor due primarily to moisture stress.

Principal Insect, Disease, and Abiotic Damage Concerns

Summer frost is a less significant factor in the IDFxm than in the IDFdk due to the prevalence of steep slopes and the warmer climate. On level terrain, summer frost may significantly limit Fd regeneration in some years.

Douglas-fir beetle causes frequent mortality of mature Fd, especially those under moisture stress or damaged by logging.

Laminated root rot and Armillaria root disease kill pockets of Fd stems, but are less common than in the IDFdk.

SILVICULTURE CONSIDERATIONS

Silviculture Considerations Table — Harvest Assumptions

No or limited canopy refers to clearcuts and group selection systems with larger harvested groups (generally >50 m wide);

Canopy present for Fd stands includes single tree selection and faller selection systems with up to 60% volume removal as well as low-volume small group selection systems where groups of 2–4 trees are felled. In P1 stands, **canopy present** includes group selection systems with small to medium-size harvested groups (25–50 m wide between mature stand edges).

IDFxm 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	
01a Typic Phase	P:Fd D:At	<i>moisture deficits</i> Fd , At <i>summer frost (level sites)</i> Fd	Fd , At Fd	low; Dry shrub - pinegrass •pinegrass cover and vigour generally increase following canopy opening; •pinegrass is strong competitor for soil moisture.
<ul style="list-style-type: none"> •most reliable regeneration option for Fd is protection and release of advance regeneration and ingress of natural regeneration under partial canopy of mature Fd; some fill planting may be required to achieve full stocking; •light ground disturbance generally increases natural regeneration ingress; •survival of planted Fd variable and often poor, especially on sites without residual tree cover; •excessive opening of Fd canopy may result in sunscald and shock of advance Fd regeneration; •survival of planted Fd may be increased by site preparation to increase moisture availability and reduce grass competition; •maintenance of soil organic layers and woody debris important for long-term site productivity and regeneration. 				
01b Cold Phase	P:PI Fd D:At	<i>moisture deficits</i> Fd , At <i>summer frost (level sites)</i> Fd	Fd , At Fd	low; Dry shrub - pinegrass •pinegrass generally increases following canopy opening and is a strong competitor for soil moisture.
<p>same as 01a except:</p> <ul style="list-style-type: none"> •natural PI regeneration usually adequate to restock cleared sites if sufficient cones present and well distributed; scarification generally not required; •survival of planted PI on cleared sites generally moderate; in partial cuts, survival and growth likely reduced in shaded microsites; •Fd natural regeneration ingress and survival of planted Fd generally poor due to frequent summer frost; may be increased somewhat under PI canopy or nurse crop. 				

IDFxm 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	
02	P:Fd	<i>moisture deficits</i> Fd <i>nutrient deficits</i> <i>high surface temperatures</i> <i>(Typic Phase)</i>	Fd	low; Dry shrub - bunchgrass •shrub and herbaceous vegetation development on these sites limited by hot, dry soils.
<ul style="list-style-type: none"> •timber productivity very low; sites difficult to regenerate; survival of planted trees poor and advance regeneration often sparse; •most reliable regeneration option for Fd is release of advance regeneration and ingress of natural regeneration under relatively high levels of Fd canopy closure; •survival and growth of planted Fd generally poor due to moisture stress; •maintenance of soil organic layers and woody debris important for long-term site productivity and natural regeneration. 				
03	P:PI Fd	<i>moisture deficits</i> Fd <i>nutrient deficits</i> Fd <i>summer frost</i> Fd <i>light deficits</i> ----	Fd Fd Fd PI	low; Dry shrub - kinnikinnick •vegetation changes little following tree canopy opening.
<ul style="list-style-type: none"> •PI natural regeneration is usually adequate to restock cleared areas if sufficient cones are present and well distributed; seedbed management usually not required; •Fd is marginally adapted to these sites; limited by growing-season frost and nutrient and moisture deficits; •survival of planted Fd likely poor; survival of planted PI likely moderate to high; •maintenance of soil organic layers and woody debris important for long-term site productivity and natural regeneration. 				

IDFxm 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
04	P:Fd	<i>moisture deficits</i> Fd <i>high surface temperatures</i>	low; Dry shrub - bunchgrass
<ul style="list-style-type: none"> •timber productivity generally very low; sites very difficult to regenerate following logging due to sparse advance regeneration, slow regeneration ingress, and poor survival of planted trees; •natural regeneration establishment and growth likely best under near-natural canopy levels; •regeneration ingress and advance regeneration typically sparse; growth limited by moisture stress and likely best in light shade; •maintenance of soil organic layers and woody debris important for long-term site productivity and regeneration. 			
05	P:Fd D:At	<i>moisture deficits</i> Fd <i>light deficits</i> ----	low; Pinegrass - low forb
<ul style="list-style-type: none"> •most reliable regeneration option for Fd is protection and release of advance regeneration and ingress of natural regeneration under partial canopy of mature Fd; some fill planting may be required to achieve full stocking; •light ground disturbance generally increases natural regeneration ingress under a partial canopy; •survival of planted Fd variable and often poor but probably better than on /01a sites; •limitations to survival of planted Fd less severe than on /02, /03, or /04; •competition for moisture from grasses less severe than on /01 sites; •maintenance of soil organic layers and woody debris important for long-term site productivity and regeneration. 			

IDFxm 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	
06	P:Fd	<i>moisture deficits</i>		low; Pinegrass - low forb
	D:At	Fd <i>summer frost</i> Fd <i>light deficits</i> ----	---- Fd At	
<ul style="list-style-type: none"> •similar to /01a except: •moisture deficits less limiting and summer frost more limiting to survival and growth of planted Fd; •experience indicates that survival and early growth of planted PI may be moderate on cleared areas; growth to maturity uncertain, since PI is generally absent from natural stands. 				
07	P:Fd	<i>summer frost</i>		medium; Mixed shrub - grass
	D:At Ep	Fd <i>light deficits</i> ---- <i>moisture deficits</i>	---- Fd, At, Ep	
<ul style="list-style-type: none"> •partial harvesting with light surface disturbance to increase regeneration ingress is likely a suitable option for these sites; •advance Fd regeneration is generally sparse but can contribute to regeneration stocking; •Sxw advance regeneration is often present; growth is generally slow but evidence indicates that Sxw may form crop tree on wettest sites if protected in partial-cut systems; •survival of planted Fd generally greater than on /01a sites and may be sufficient for reforestation of partially harvested sites; •summer frost damage to Fd likely low under partial canopy of Fd or deciduous trees; •sites susceptible to soil compaction and rutting. 				

IDFxm 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	
08	P:Fd Sxw D:Act At	<i>light deficits (vegetation overtop)</i> Fd , Sxw, Act , At <i>summer frost</i> Fd , Sxw	Canopy present Fd , Sxw, Act , At Fd	medium; Mixed shrub - rose
<ul style="list-style-type: none"> •prompt planting of Sxw and Fd under a partial tree canopy with control of competing vegetation at planting spot should restock these sites; growth rates of Sxw may be limited by frost in some years and by moisture stress in dry years; •natural Sxw and Fd regeneration ingress generally slow, limited by competing shrub and herbaceous vegetation; •advance Sxw and Fd regeneration can generally contribute to regeneration stocking; •experience indicates that PI can be successfully established on these sites; PI not present in most natural stands; •soils are very sensitive to rutting and compaction during growing season. 				
09	P:Sxw PI D:At Act	<i>cold, wet soils</i> Sxw, PI, At <i>light deficits (vegetation overtop)</i> Sxw, PI , At , Act <i>summer frost</i> Sxw, Act, At	Sxw, PI, At Sxw, PI , At , Act ----	medium; Mixed shrub - wet forb •shrub and tall herbaceous vegetation cover increases following canopy removal.
<ul style="list-style-type: none"> •survival and growth of planted Sxw on all sites and PI on cleared sites generally adequate to restock sites if planted on relatively dry microsites with spot vegetation control; •natural regeneration of PI and Sxw on cleared sites is slow, limited by competing vegetation and thick soil organic layers; •risk of summer frost damage to Sxw may be somewhat reduced by planting under partial tree or shrub canopy; •soils very susceptible to rutting, puddling, and compaction. 				

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)										
ESSF xv1	ESSFg, ESSF undif	npe	npe	npe	npe	npe	npe	npe	npe	npe		
ESSF xv2	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		
IDF xw	IDFa2	/01,/05,/07	/02	/03	/04	/06	/08	/09				

^aNo previous equivalent (npe)

APPENDIX 5
ACTUAL SOIL MOISTURE REGIME
RELATIONSHIP TO RELATIVE SOIL MOISTURE
REGIME AND BIOGEOCLIMATIC UNIT

BEC unit	Relative soil moisture regime							7
	0	1	2	3	4	5	6	
BGxh3	ED	ED	ED	ED	ED	SD	M	W
BGxw2	ED	ED	ED	ED	ED	SD	M	W
IDFwx	ED	ED	VD	VD	MD	SD	M	W
IDFxm	ED	ED	VD	VD	MD	SD	M	W
SBPSxc	ED	ED	VD	VD	MD	SD	M	W
SBPSdc	ED	ED	VD	MD	SD	F	M-VM	W
SBPSmk	ED	VD	VD	MD	SD	F	M-VM	W
IDFdk3	ED	VD	VD	VD	MD	F	M	W
IDFdk4	ED	VD	VD	VD	MD	F	M	W
IDFdw	ED	VD	VD	MD	MD	F	VM	W
IDFmw2	VD	VD	VD	MD	SD	F	VM	W
MSxk	VD	VD	VD	VD	MD	F	M	W
MSxv	VD	VD	VD	MD	SD	F	VM	W
SBPSmc	VD	VD	VD	MD	SD	F	M-VM	W
SBSdw1	VD	MD	MD	SD	SD	F	M	W
SBSdw2	VD	MD	MD	SD	SD	F	M	W
SBSmh	VD	MD	MD	SD	SD	M	VM	W
SBSmw	VD	MD	MD	SD	F	M	VM	W
SBSmc1	VD	MD	MD	SD	F	M	VM	W
SBSmc2	VD	MD	MD	SD	F	M	VM	W
SBSwk1	VD	MD	SD	F	F	M	VM	W
ICHdk	VD	VD	VD	MD	SD	M	VM	W
ICHmk3	VD	MD	MD	SD	F	M	VM	W
ICHwk2	VD	MD	SD	F	F	M	VM	W
ICHwk4	VD	MD	SD	F	F	M	VM	W
ESSF xv	VD	VD	MD	MD	SD	F	M	W
ESSF dc2	VD	MD	MD	SD	SD-F	M	VM	W
ESSF wk1	MD	MD	SD	F	M	M	VM	W
ESSF wk3	MD	MD	SD	F	M	M	VM	W

Actual Moisture Regime Codes:

ED=extremely dry; VD=very dry; MD=moderately dry; SD=slightly dry;
 F=fresh; M=moist; VM=very moist; W=wet

TABLE 5.3.1 Distribution of Marsh Site Associations by biogeoclimatic zone

	BG PP	BWBS SWB	ESSF	ICH	IDF	MS	SBPS SBS	CDF	CWH	MH
Wm01 Beaked sedge – Water sedge	x	xx	x	xxx	xxx	xx	xx		x	
Wm02 Swamp horsetail – Beaked sedge		x		x	x	x	xx			
Wm03 Awned sedge	x				x					
Wm04 Common spike-rush	x	x		xx	x	x	xx		x	
Wm05 Cattail	xxx	x		xx	xx	x	xx	xx	x ^s	
Wm06 Great bulrush	xxx	x		x	xx	xx	x	x	x	
Wm07 Baltic rush	x				xx					
Wm50 Sitka sedge – Hemlock-parsley								xx	xx	
Wm51 Three-way sedge				x				x	x	

x = incidental; < 5% of wetlands

xx = minor; 5–25% of wetlands

xxx = major; >25% of wetlands

s = southern subzones only

TABLE 5.3.2 Marsh Species Importance Table

Species		Wm01	Wm02	Wm03	Wm04	Wm05
Herbs and Dwarf Shrubs	<i>Carex utriculata</i>					
	<i>Carex aquatilis</i>					
	<i>Equisetum fluviatile</i>					
	<i>Comarum palustre</i>					
	<i>Sium suave</i>					
	<i>Carex exsiccata</i>					
	<i>Carex atherodes</i>					
	<i>Polygonum amphibium</i>					
	<i>Eleocharis palustris</i>					
	<i>Potamogeton richardsonii</i>					
	<i>Typha latifolia</i>					
	<i>Schoenoplectus acutus</i>					
	<i>Menyanthes trifoliata</i>					
	<i>Utricularia macrorhiza</i>					
	<i>Juncus balticus</i>					
	<i>Hordeum jubatum</i>					
	<i>Potentilla anserina</i>					
	<i>Calamagrostis canadensis</i>					
	<i>Cicuta douglasii</i>					
	<i>Lysichiton americanus</i>					
	<i>Oenanthe sarmentosa</i>					
	<i>Galium trifidum</i>					
	<i>Spiraea douglasii</i>					
	<i>Carex sitchensis</i>					
	<i>Nuphar lutea</i> ssp. <i>polysepala</i>					
	<i>Dulichium arundinaceum</i>					
Mosses	<i>Drepanocladus</i> spp.					
	<i>Wamstorfia</i> spp.					

Carex atherodes

General Description

The Awned sedge Marsh Site Association is uncommon and restricted to dry climates of the Central Interior at low to middle elevations. These marshes are generally small and occur most



commonly in small potholes surrounded by forest, where water levels are shallow and relatively constant.



Sites are always dominated by *Carex atherodes*, but infrequently other species, such as *Drepanocladus aduncus*, *Myriophyllum verticillatum*, *Alopecurus aequalis*, or *Carex utriculata*, occur in abundance.

Standing water is slightly alkaline; rooting substrates are fine-textured mineral or shallow sedge-derived peat. Common soil types are Humisols and Humic Gleysols.

Characteristic Vegetation

- Tree layer** (0 - 0 - 0)
- Shrub layer** (0 - 0 - 4)
- Herb layer** (55 - 90 - 100)
- Carex atherodes*
- Moss layer** (0 - 0 - 95)
- Drepanocladus aduncus*

Comments

This unit is similar to the *Wm01* but is much more limited in distribution and seems to be favoured by more alkaline waters. In the BG zone, Woolly sedge marshes occur on sites similar to the *Wm03* (see additional units).

Wm03 sites often occupy entire basins but they are also found in small patches within some larger *Wm01* or *Wm08* marshes.

The distribution of *Wm03* is primarily within rangelands and *C. atherodes* is palatable; many sites experience some level of grazing pressure.

Wetland Edatopic Grid

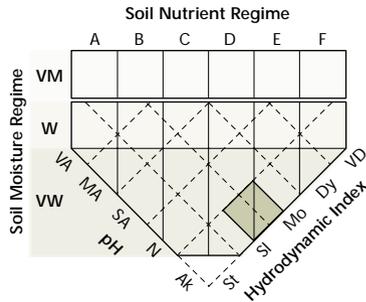


TABLE 5.3.1 Distribution of Marsh Site Associations by biogeoclimatic zone

	BG PP	BWBS SWB	ESSF	ICH	IDF	MS	SBPS SBS	CDF	CWH	MH
Wm01 Beaked sedge – Water sedge	x	xx	x	xxx	xxx	xx	xx		x	
Wm02 Swamp horsetail – Beaked sedge		x		x	x	x	xx			
Wm03 Awned sedge	x				x					
Wm04 Common spike-rush	x	x		xx	x	x	xx		x	
Wm05 Cattail	xxx	x		xx	xx	x	xx	xx	x ^s	
Wm06 Great bulrush	xxx	x		x	xx	xx	x	x	x	
Wm07 Baltic rush	x				xx					
Wm50 Sitka sedge – Hemlock-parsley								xx	xx	
Wm51 Three-way sedge				x				x	x	

x = incidental; < 5% of wetlands

xx = minor; 5–25% of wetlands

xxx = major; >25% of wetlands

s = southern subzones only

TABLE 5.3.2 Marsh Species Importance Table

Species		Wm01	Wm02	Wm03	Wm04	Wm05
Herbs and Dwarf Shrubs	<i>Carex utriculata</i>					
	<i>Carex aquatilis</i>					
	<i>Equisetum fluviatile</i>					
	<i>Comarum palustre</i>					
	<i>Sium suave</i>					
	<i>Carex exsiccata</i>					
	<i>Carex atherodes</i>					
	<i>Polygonum amphibium</i>					
	<i>Eleocharis palustris</i>					
	<i>Potamogeton richardsonii</i>					
	<i>Typha latifolia</i>					
	<i>Schoenoplectus acutus</i>					
	<i>Menyanthes trifoliata</i>					
	<i>Utricularia macrorhiza</i>					
	<i>Juncus balticus</i>					
	<i>Hordeum jubatum</i>					
	<i>Potentilla anserina</i>					
	<i>Calamagrostis canadensis</i>					
	<i>Cicuta douglasii</i>					
	<i>Lysichiton americanus</i>					
	<i>Oenanthe sarmentosa</i>					
	<i>Galium trifidum</i>					
	<i>Spiraea douglasii</i>					
	<i>Carex sitchensis</i>					
	<i>Nuphar lutea</i> ssp. <i>polysepala</i>					
	<i>Dulichium arundinaceum</i>					
Mosses	<i>Drepanocladus</i> spp.					
	<i>Wamstorfia</i> spp.					

TABLE 5.3.1 Distribution of Marsh Site Associations by biogeoclimatic zone

	BG PP	BWBS SWB	ESSF	ICH	IDF	MS	SBPS SBS	CDF	CWH	MH
Wm01 Beaked sedge – Water sedge	x	xx	x	xxx	xxx	xx	xx		x	
Wm02 Swamp horsetail – Beaked sedge		x		x	x	x	xx			
Wm03 Awned sedge	x				x					
Wm04 Common spike-rush	x	x		xx	x	x	xx		x	
Wm05 Cattail	xxx	x		xx	xx	x	xx	xx	x ^s	
Wm06 Great bulrush	xxx	x		x	xx	xx	x	x	x	
Wm07 Baltic rush	x				xx					
Wm50 Sitka sedge – Hemlock-parsley								xx	xx	
Wm51 Three-way sedge				x				x	x	

x = incidental; < 5% of wetlands

xx = minor; 5–25% of wetlands

xxx = major; >25% of wetlands

s = southern subzones only

TABLE 5.3.2 Marsh Species Importance Table

Species		Wm01	Wm02	Wm03	Wm04	Wm05
Herbs and Dwarf Shrubs	<i>Carex utriculata</i>					
	<i>Carex aquatilis</i>					
	<i>Equisetum fluviatile</i>					
	<i>Comarum palustre</i>					
	<i>Sium suave</i>					
	<i>Carex exsiccata</i>					
	<i>Carex atherodes</i>					
	<i>Polygonum amphibium</i>					
	<i>Eleocharis palustris</i>					
	<i>Potamogeton richardsonii</i>					
	<i>Typha latifolia</i>					
	<i>Schoenoplectus acutus</i>					
	<i>Menyanthes trifoliata</i>					
	<i>Utricularia macrorhiza</i>					
	<i>Juncus balticus</i>					
	<i>Hordeum jubatum</i>					
	<i>Potentilla anserina</i>					
	<i>Calamagrostis canadensis</i>					
	<i>Cicuta douglasii</i>					
	<i>Lysichiton americanus</i>					
	<i>Oenanthe sarmentosa</i>					
	<i>Galium trifidum</i>					
	<i>Spiraea douglasii</i>					
	<i>Carex sitchensis</i>					
	<i>Nuphar lutea</i> ssp. <i>polysepala</i>					
	<i>Dulichium arundinaceum</i>					
Mosses	<i>Drepanocladus</i> spp.					
	<i>Wamstorfia</i> spp.					

Wm06	Wm07	Wm50	Wm51	Common Name
				beaked sedge
				water sedge
				swamp horsetail
				marsh cinquefoil
				hemlock water-parsnip
				inflated sedge
				awned sedge
				water smartweed
				common spike-rush
				Richardson's pondweed
				common cattail
				great bulrush
				buckbean
				greater bladderwort
				Baltic rush
				foxtail barley
				common silverweed
				bluejoint
				Douglas' water-hemlock
				skunk cabbage
				Pacific water-parsley
				small bedstraw
				pink spirea
				Sitka sedge
				yellow pond-lily
				three-way sedge
				hook-mosses: intermediate
				hook-mosses: poor

