

TABLE 8. Summary of climate data for biogeoclimatic units ^a

Climatic Characteristics	Biogeoclimatic Unit							
		SBSdk	SBSdw2	SBSdw3	SBSmk1	SBSmc2	SBSmc3	SBPSmc
Annual Precipitation (mm)	Mean	480.6	552.9	494.4	727.4	574.4	505.6	N/A
	Range	415.9 - 586.3	427.0 - 648.5	N/A	628.3 - 838.2	460.1	N/A	N/A
Growing Season Precipitation (mm)	Mean	211.0	274.8	259.4	272.6	229.4	261.4	195.9
	Range	167.4 - 323.0	248.0 - 296.3	224.1 - 298.4	196.8 - 432.0	139.4 - 348.9	242.8 - 288.7	156.0 - 235.5
Annual Snowfall (cm)	Mean	188.1	204.1	204.2	306.3	237.1	197.1	N/A
	Range	121.9 - 265.2	169.8 - 225.8	N/A	241.7 - 355.5	177.3 - 264.0	N/A	N/A
Annual Temperature (°C)	Mean	2.1	3.4	2.6	1.5	1.5	0.6	0.8
	Range	0.8 - 3.5	2.0 - 4.4	1.3 - 3.5	-0.2 - 3.3	-0.7 - 3.6	N/A	0.7 - 0.8
Growing Degree-days (>5°C)	Mean	1028	1224	1089	975	947	N/A	N/A
	Range	884 - 1145	1072 - 1409	N/A	751 - 1198	844 - 1012	N/A	N/A
Frost-free Period (days)	Mean	70	105	83	73	116	18	N/A
	Range	39 - 103	94 - 122	N/A	43 - 92	106 - 125	N/A	N/A

^a Reynolds, G. 1989. Climatic data summaries for the biogeoclimatic zones of British Columbia. B.C. Min. For., Research Branch, Victoria, B.C. Unpublished report.

TABLE 9. Some important wildlife species that use biogeoclimatic units in the West Central guide area

Species	Occurrence in Variants							
	SBSdk	SBSdw2	SBSdw3	SBSmc2	SBSmc3	SBSmk1	SBPSmc	ESSFmv1
Moose (winter range)	*	*	*		*	*	*	
Mule Deer (winter range)	*	*	*	*	*		*	
White-tailed Deer	*		*		*	*		
Elk			*					
Caribou ^a	*				*		*	*
Grizzly Bear ^a	*	*	*	*	*	*	*	*
Furbearers	*	*	*	*	*	*	*	*

^a Denotes species "blue listed" in 1989 by the Ministry of Environment. Because of major declines in their populations, they are considered sensitive and/or deserving of management attention.



SBSdw3
Variant Summary

4.3 Stuart Dry Warm Sub-Boreal Spruce⁹

Location

The SBSdw3 occurs northward from its border with the SBSdw2 to the confluence of the Nechako and Fraser rivers. From there it stretches northwest to Stuart Lake where it bulges north to about Inzana Lake and west to the western ends of Stuart and Trembleur lakes.

Elevation Range

750 to 1100 m

Climate

The SBSdw3 is warm relative to other biogeoclimatic units in this guide and region. Winter precipitation is relatively low for the subzone with snowpacks generally accumulating up to about 2 m in depth. Climatic growth-limiting factors are drought on drier sites and frost on frost-prone sites.

Soils, geology, and landforms

North of Vanderhoof, bedrock types in this subzone include Palaeozoic limestones, chert, argillite, and various volcanic and metamorphic rocks. South and east of Vanderhoof, the dominant bedrock types are volcanics of Triassic, Jurassic, and Tertiary age, and a variety of Palaeozoic sedimentary rocks. Soils have formed on predominantly morainal and lacustrine materials. Morainal deposits usually have gravelly clay loam and loam textures, associated with Gray Luvisolic soils, including Brunisolic Gray Luvisols. Dystric Brunisols have formed on coarser (gravelly sandy loam) morainal materials. Organic soils (Fibrisols) occur as a minor component of morainal landscapes. Lacustrine deposits have fine textures, ranging from silt loam to heavy clay, and Gray Luvisolic soils. Minor areas of glaciofluvial materials are coarser-textured (gravelly sand) and associated with Dystric Brunisols.

Distinguishing the SBSdw3 from adjoining biogeoclimatic units

SBSdw2 has:

- pinegrass on mesic sites; and
- no queen's cup on mesic and wetter sites.

SBSmc2 has:

- more subalpine fir but no Douglas-fir in the canopy;
- more black huckleberry but no saskatoon in the shrub layer; and
- five-leaved bramble but no wild sarsaparilla in the herb layer.

SBSmc3 has:

- more subalpine fir but no Douglas-fir or trembling aspen in the canopy;
- more black huckleberry but no saskatoon in the shrub layer; and
- no wild sarsaparilla in the herb layer.

SBSmw has:

- more subalpine fir in the canopy;
- occasional five-leaved bramble on mesic sites; and
- three-leaved foamflower on moist to wet sites.

⁹ Formerly SBSk3

SBSmh has:

- infrequent occurrence of lodgepole pine in the canopy;
- beaked hazelnut in the shrub layer; and
- Hooker's fairybells in the herb layer.

Forests

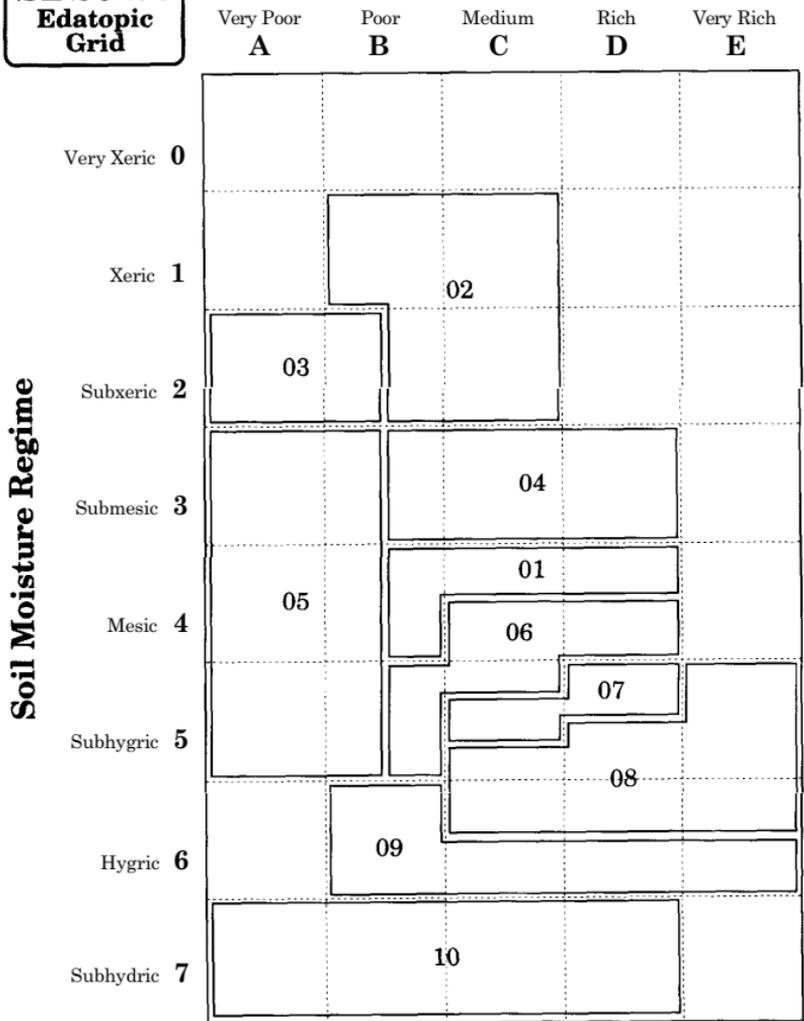
The forests of the SBSdw3 are some of the most diverse in the region. Coniferous forests in this unit tend to be mixtures of lodgepole pine, Douglas-fir, and hybrid white spruce with lodgepole pine and/or Douglas-fir dominating on drier sites and hybrid white spruce dominating on wetter sites. Subalpine fir is uncommon at low elevation, but increases in abundance at the higher reaches. Black spruce occurs in wetlands, and in combination with lodgepole pine on poorer upland sites associated with compact morainal or lacustrine soils. Deciduous forests are most commonly dominated by trembling aspen, but localized paper birch forests do exist, especially near Prince George and Fort St. James. Black cottonwood is common along rivers and streams.

Wildlife

The SBSdw3 supports a wide variety of wildlife. Douglas-fir stands provide important winter habitat for mule deer, and early spring habitat for black bear. South-facing slopes along the Stuart and Nechako rivers are used in the winter by a small population of elk. Riparian forests are used in the early spring by black bear and grizzly bear. This habitat is also used by moose, white-tailed deer, lynx and ruffed grouse. Shrub-dominated wetlands support beaver, muskrat, mink, otter, northern harrier, and, in some areas, sandhill cranes. Habitat in and around small lakes is used by moose, gray wolf, beaver, muskrat, mink, otter and birds such as osprey, bald eagle, and cavity nesters. White spruce - lodgepole pine forests are used by moose, grizzly bear, black bear, spruce grouse, northern goshawk, and furbearers, including wolverine, marten, and red squirrel.

SBSdw3
Edatopic
Grid

Soil Nutrient Regime



- | | |
|-------------------------------------|--------------------------------------|
| 01 SxwFd - Pinegrass | 07 Sxw - Twinberry |
| 02 FdPl - Cladonia | 08 Sxw - Oak fern |
| 03 Pl - Feathermoss - Cladina | 09 Sxw - Horsetail - Glow moss |
| 04 SxwFd - Ricegrass | 10 Sb - Soft-leaved sedge - Sphagnum |
| 05 PlSb - Feathermoss | |
| 06 Sxw - Pink spirea - Prickly rose | |

FIGURE 13. Edatopic grid displaying site units in the SBSdw3 variant.

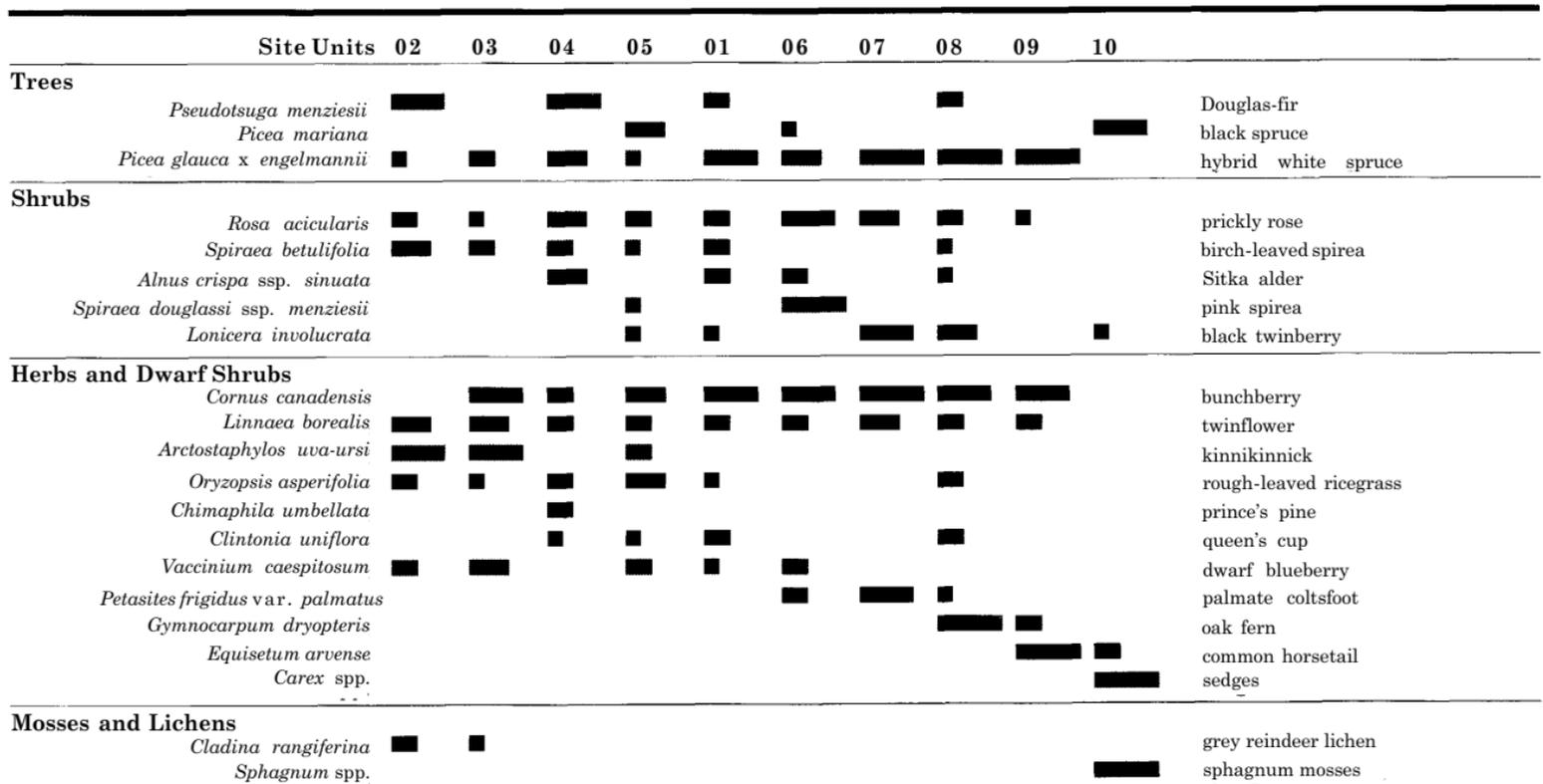


FIGURE 14. SRSdw3 vegetation table.

Prominence.class: ■ 1 ■ 2 ■ 3 ■ 4 ■ 5

SBSdw3
Site Series Key

- 1a Black spruce or tamarack present in canopy.
- 2a Pure black spruce canopy or mixture of black spruce and tamarack; *Sphagnum* spp. (pp. 312-314)¹⁰ present; organic soils. **SBSdw3/10**
- 2b Mixed stand of black spruce and hybrid white spruce or black spruce and lodgepole pine; *Sphagnum* spp. present or absent; mineral or organic soils.
- 3a Hybrid white spruce and black spruce canopy; level or depression; no mineral soil within 40 cm of surface; often adjacent to bogs; *Equisetum* spp. (pp. 281-284) abundant. **SBSdw3/09**
- 3b Predominantly lodgepole pine canopy with black spruce; gently sloping or level; mineral soils; *Equisetum* spp. low cover (< 1%) or absent. **SBSdw3/05**
- 1b Black spruce absent from canopy.
- 4a Canopy dominated by Douglas-fir.
- 5a Shallow soils over bedrock or colluvial soils; upper slope or crest; *Arctostaphylos uva-ursi* (p. 82) moderate cover (usually >5%). **SBSdw3/02**
- 5b Deep soils (>1 m); slope position variable; *Arctostaphylos uva-ursi* generally low cover (< 5%) or absent.
- 6a Mid- to lower slope or level; soils variable; *Clintonia uniflora* (p. 131) common, *Rubus parviflorus* (p. 36) or *Lonicera involucrata* (p. 48) present. **SBSdw3/01**
- 6b Mid- to upper slope; moderately coarse to coarse-textured soils; *Clintonia uniflora*, *Rubus parviflorus* and *Lonicera involucrata* generally low cover (< 1% each) or absent. **SBSdw3/04**
- 4b Canopy dominated by hybrid white spruce or lodgepole pine.

¹⁰ Page numbers refer to the publication *Plants of Northern British Columbia* (MacKinnon et al. 1992)

- 7a Canopy pure lodgepole pine; level; coarse-textured fluvial material; *Arctostaphylos uva-ursi* common. **SBSdw3/03**
- 7b Canopy generally mixed; soils variable; *Arctostaphylos uva-ursi* not common.
- 8a Lower to toe slope, depression or level (midslope only if north-facing); *Equisetum* spp. (pp. 281-284), *Gymnocarpium dryopteris* (p. 293) or *Petasites frigidus* var. *palmatus* (p. 114) abundant.
- 9a Trembling aspen often present in canopy; soil texture variable; *Petasites frigidus* var. *palmatus* or *Equisetum* spp. abundant, *Gymnocarpium dryopteris* low cover (< 5%) or absent.
- 10a *Equisetum* spp. common; adjacent to flowing water or bog. **SBSdw3/09**
- 10b *Equisetum* spp. low cover or absent; generally not adjacent to flowing water or bog.
- 11a Generally lodgepole pine - aspen canopy; moderately fine to fine textured lacustrine soils; *Spiraea douglasii* ssp. *menziesii* (p. 45) present. **SBSdw3/06**
- 11b Generally hybrid white spruce or hybrid white spruce - aspen canopy; soils variable; *Spiraea douglasii* ssp. *menziesii* absent. **SBSdw3/07**
- 9b Trembling aspen generally absent from canopy; usually moderately coarse to coarse-textured soils; *Gymnocarpium dryopteris* abundant. **SBSdw3/08**
- 8b Mid- to upper slope; *Equisetum* spp., *Gymnocarpium dryopteris* and *Petasites frigidus* var. *palmatus* low cover (< 1%) or absent.
- 12a Mid- to lower slope or level; soils variable; *Clintonia uniflora* common, *Rubus parviflorus* or *Lonicera involucrata* present. **SBSdw3/01**
- 12b Mid- to upper slope; moderately coarse to coarse-textured soils; *Clintonia uniflora*, *Rubus parviflorus* and *Lonicera involucrata* generally low cover (< 1% each) or absent. **SBSdw3/04**

VEGETATION

Tree Layer: 40% cover
lodgepole pine, hybrid white spruce, Douglas-fir

Shrub Layer: 35% cover

<i>Spiraea betulifolia</i>	(birch-leaved spirea)
<i>Rosa acicularis</i>	(prickly rose)
<i>Viburnum edule</i>	(highbush-cranberry)
<i>Lonicera involucrata</i>	(black twinberry)
<i>Rubus parviflorus</i>	(thimbleberry)
<i>[Alnus crispa ssp. sinuata</i>	(Sitka alder)]
hybrid white spruce	

Herb Layer: 40% cover

<i>Cornus canadensis</i>	(bunchberry)
<i>Clintonia uniflora</i>	(queen's cup)
<i>Aster conspicuus</i>	(showy aster)
<i>Linnaea borealis</i>	(twinflower)
<i>Amica cordifolia</i>	(heart-leaved arnica)
<i>Smilacina racemosa</i>	(false Solomon's-seal)

Moss Layer: 90% cover

<i>Pleurozium schreberi</i>	(red-stemmed feathermoss)
<i>Ptilium crista-castrensis</i>	(knight's plume)

SOIL AND SITE

Moisture Regime:	4 (m)
Nutrient Regime:	B-D (p-r)
Slope Gradient (%):	0-30
* Slope Position:	mid (- lower) or upper with northerly aspect
Parent Material:	variable
Soil Texture:	variable
Coarse Fragments (%):	0-65

COMMENTS: the abundance of Sitka alder is variable

DISTRIBUTION: very common and widespread



Spiraea betulifolia



Clintonia uniflora

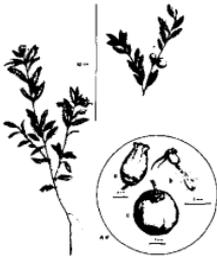


Aster conspicuus

SxwFd - Pinegrass (SBSdw3/01)

INTERPRETATIONS

- Site limitations: - sites within this unit with medium- to fine-textured lacustrine soils often have poor soil structure, leading to poor root growth; ***plant stock that will achieve better lateral root development (eg., Cu-treated), prescribe natural regeneration, or protect advance regeneration.***
- Silviculture system: - see Section 5.1
- minimize or align large slash accumulations when logging to help meet site preparation objectives and reduce fire hazard.
- Site preparation: - see Section 5.2
- Species choice: - Pl, Sx, Fd
- Vegetation Potential: - low to moderate (trembling aspen, fireweed, prickly rose)
- Reforestation: - manage to maintain Fd component.
- attempt to regenerate naturally if potential exists.
- if abundant advance regeneration is present, attempt to log in a manner that protects this regeneration.
- fill-planting may be required to meet stocking requirements if a partial cutting system is used.
- help maintain stand diversity on sites to be planted with Pl by mapping aspen patches prior to harvest and planting these areas to spruce.
- young Bl regeneration (< 3 m tall) may be susceptible to heavy browsing by moose.
- Concerns: - full tree harvesting will lead to nutrient depletion and seriously reduce cones; ***woody debris and cones should be distributed across these sites (ie., lop and scatter).***
- site conditions may lead to frost damage of Fd and Sx regeneration, especially in any naturally occurring or artificially created depression; ***leaving a partial canopy and/or choosing a frost-resistant species (eg., Pl) is advised.***
- risk of windthrow after partial cuts will be high on sites with root-restricting layers at depths < 25 cm.
- comandra blister rust may cause cankers on pine if bastard toad-flax (*Geocaulon lividum*) occurs nearby.
- mountain pine beetle may cause mortality in large-diameter lodgepole pine stands of age class > 7.

*Spiraea betulifolia**Arctostaphylos uva-ursi**Peltigera malacea*

VEGETATION

Tree Layer: 30% cover
Douglas-fir, lodgepolepine

Shrub Layer: 25% cover
Spiraea betulifolia (birch-leaved spirea)
Shepherdia canadensis (soopolallie)
Rosa acicularis (prickly rose)
Amelanchier alnifolia (saskatoon)
Vaccinium membranaceum (black huckleberry)
Douglas-fir
hybrid white spruce

Herb Layer: 40% cover
Arctostaphylos uva-ursi (kinnikinnick)
Linnaea borealis (twinflower)
Disporum trachycarpum (rough-fruited fairybells)
Vaccinium caespitosum (dwarf blueberry)
Oryzopsis asperifolia (rough-leaved ricegrass)
Cornus canadensis (bunchberry)
Antennaria neglecta (field pussytoes)

Moss Layer: 50% cover
Peltigera malacea (apple pelt)
Cladonia rangiferina (grey reindeer lichen)
Pleurozium schreberi (red-stemmed feathermoss)
Dicranum polysetum (wavy-leaved moss)
Cladonia phyllophora (black-foot cladonia)
Cladonia ecmocyna (orange-foot lichen)

SOIL AND SITE

Moisture Regime: 1-2 (x-sx)
Nutrient Regime: B-C (p-m)
* Aspect: southerly
* Slope Gradient (%): 10-40
* Slope Position: (mid -) upper - crest
Parent Material: variable; often shallow to bedrock
Soil Texture: medium - coarse (only medium textured on shallow soils)
Coarse Fragments (%): 12-85

DISTRIBUTION: uncommon; restricted to south-facing coarse-textured eskers or sites with bedrock close to surface

FdPl - Cladonia (SBSdw3/02)

INTERPRETATIONS

- Site limitations: - sites within this unit with high coarse fragment content (> 70%) will have significantly reduced soil moisture retention and will be extremely difficult to plant; ***attempt to regenerate naturally by retaining Pl cones and/or leaving Fd seed-trees on site.***
- Silviculture system: - see Section 5.1
- Site preparation: - light scarification for seedbed preparation or summer logging with no site preparation.
- Species choice: - Fd, Pl
- Vegetation potential: - low
- Reforestation: - manage to maintain Fd component.
- as many Fd stems as possible should be left for shade in order to help reduce excessive drying or heating of upper soil horizons.
- natural Pl and Fd regeneration should be promoted by light scarification or spot screening.
- fill-planting may be required to meet stocking requirements.
- Concerns: - avoid clearcutting as stand establishment would likely be difficult because of high surface soil temperatures and drought.
- these units may represent important early-season range for wildlife, so prescription should be discussed with wildlife personnel.
- site and soil conditions of this unit result in drought hazard for a significant portion of the growing season; ***leaving a shelterwood overstory can reduce the severity of the drought hazard.***
- sites within this unit with shallow and/or coarse-textured soils are vulnerable to nutrient deficiency if forest floors are reduced; ***site preparation methods that reduce forest floor thickness, such as slashburning or brushblading, must be avoided.***

VEGETATION

Tree Layer: 20% cover
lodgepole pine

Shrub Layer: 40% cover
Shepherdia canadensis (soopolallie)
Spiraea betulifolia (birch-leaved spirea)
Rosa acicularis (prickly rose)
Salix spp. (willows)
[Vaccinium myrtilloides (velvet-leaved blueberry)]
 hybrid white spruce
 lodgepole pine



Shepherdia canadensis



Arctostaphylos uva-ursi

Herb Layer: 50% cover
Arctostaphylos uva-ursi (kinnikinnick)
Cornus canadensis (bunchberry)
Linnaea borealis (twinflower)
Vaccinium caespitosum (dwarf blueberry)
Melampyrum lineare (cow-wheat)
Pyrola asarifolia (pink wintergreen)
Pyrola chlorantha (green wintergreen)
Epilobium angustifolium (fireweed)
Galium boreale (northern bedstraw)
Goodyera oblongifolia (rattlesnake-plantain)
Lycopodium complanatum (ground-cedar)

Moss Layer: 95% cover
Pleurozium schreberi (red-stemmed feathermoss)
Dicranum polysetum (wavy-leaved moss)
Cladina rangiferina (grey reindeer lichen)
Cladonia ecmocyna (orange-foot lichen)

SOIL AND SITE

Moisture Regime: 2 (sx)
 Nutrient Regime: A-B (vp-p)
 * Slope Gradient (%): 0
 * Slope Position: level (usually) or crest
 * Parent Material: (glacio)fluvial
 * Soil Texture: (moderately coarse) - coarse
 Coarse Fragments (%): 10-65

DISTRIBUTION: uncommon, and restricted to old upper fluvial or glaciofluvial terraces



Cladina rangiferina

P1- Feathermoss - Cladina (SBSdw3/03)

INTERPRETATIONS

- Site limitations: - sites within this unit with high coarse fragment content (> 70%) will have significantly reduced soil moisture retention and will be extremely difficult to plant; ***attempt to regenerate naturally by retaining Pl cones and/or leaving Fd seed-trees on site.***
- Silviculture system: - see Section 5.1
- minimize or align large slash accumulations when logging to help meet site preparation objectives and reduce fire hazard.
- Site preparation: - light scarification for seedbed preparation or summer logging with no site preparation.
- Species choice: - Pl, (Sx)
- Vegetation potential: - low
- Reforestation: - attempt to regenerate naturally if potential exists.
- if natural regeneration is not feasible, plant Pl.
- Sx is significantly less productive than Pl on these sites.
- Concerns: - full tree harvesting will lead to nutrient depletion and seriously reduce cones; ***woody debris and cones should be distributed across these sites (ie., lop and scatter).***
- sites within this unit with shallow and/or coarse-textured soils are vulnerable to nutrient deficiency if forest floors are reduced; ***site preparation methods that reduce forest floor thickness, such as slashburning or brushblading, must be avoided.***
- site and soil conditions of this unit result in drought hazard for a significant portion of the growing season; ***natural regeneration is generally more adapted to surviving these conditions, especially during establishment.***
- comandra blister rust may cause cankers on pine if bastard toad-flax (*Geocaulon lividum*) occurs nearby.

VEGETATION

Tree Layer: 30% cover
lodgepole pine, Douglas-fir, hybrid white spruce

Shrub Layer: 40% cover
Rosa acicularis (prickly rose)
Spiraea betulifolia (birch-leaved spirea)
Amelanchier alnifolia (saskatoon)
Shepherdia canadensis (soopolallie)
Viburnum edule (highbush-cranberry)
 [*Alnus crispa* ssp. *sinuata* (Sitka alder)]
 Douglas-fir

Herb Layer: 30% cover
Linnaea borealis (twinflower)
Aralia nudicaulis (wild sarsaparilla)
Orthilia secunda (one-sided wintergreen)
Smilacina racemosa (false Solomon's-seal)
Cornus canadensis (bunchberry)
Chimaphila umbellata (prince's pine)
Arnica cordifolia (heart-leaved arnica)

Moss Layer: 80% cover
Pleurozium schreberi (red-stemmed feathermoss)
Dicranum polysetum (wavy-leaved moss)
Ptilium crista-castrensis (knight's plume)
Hylocomium splendens (step moss)

SOIL AND SITE

Moisture Regime: 3 (sm)
 Nutrient Regime: B-D (p-r)
 Slope Gradient (%): 5-65
 * Slope Position: mid - upper
 Parent Material: variable
 * Soil Texture: usually coarse - moderately coarse
 Coarse Fragments (%): 0-70

COMMENTS: similar to SBSdw3/01 but with a less developed shrub layer and generally lacking *Rubus parviflorus*

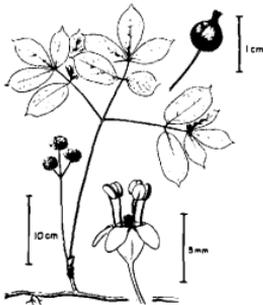
DISTRIBUTION: common, and widespread on coarser-textured soils



Shepherdia canadensis



Chimaphila umbellata

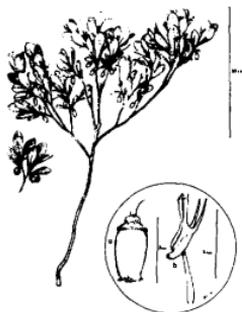


Aralia nudicaulis

SxwFd - Ricegrass (SBSdw3/04)

INTERPRETATIONS

- Site limitations: - sites within this unit with high coarse fragment content (> 70%) will have significantly reduced soil moisture retention and will be extremely difficult to plant; ***attempt to regenerate naturally by retaining Pl cones and/or leaving Fd seed-trees on site.***
- Silviculture system: - see Section 5.1
- minimize or align large slash accumulations when logging to help meet site preparation objectives and reduce fire hazard.
- Site preparation: - light scarification for seedbed preparation or summer logging with no site preparation.
- Species choice: - Pl, Fd, (**Sx**)
- Vegetation potential: - low to moderate (trembling aspen, Sitka alder, fireweed)
- Reforestation: - manage to maintain Fd component.
- attempt to regenerate naturally if potential exists.
- if Fd stems are present, conduct a stand evaluation to assess if a partial cutting system is feasible.
- if abundant advance regeneration is present, attempt to log in a manner that protects this regeneration.
- Sx will be significantly less productive than Pl and Fd on these sites.
- fill-planting may be required to meet stocking requirements if a partial cutting system is used.
- Concerns: - full tree harvesting will lead to nutrient depletion and seriously reduce cones; ***woody debris and cones should be distributed across these sites (ie., lop and scatter)***
- site and soil conditions of this unit result in drought hazard for a significant portion of the growing season; ***leaving a shelterwood overstory can reduce the severity of the drought hazard.***
- sites within this unit with shallow and/or coarse-textured soils are vulnerable to nutrient deficiency if forest floors are reduced; ***site preparation methods that reduce forest floor thickness, such as slashburning or brushblading, must be avoided.***
- comandra blister rust may cause cankers on pine if bastard toad-flax (*Geocaulon lividum*) occurs nearby.

*Vaccinium myrtilloides**Vaccinium caespitosum**Pleurozium schreberi*

VEGETATION

Tree Layer: 30% cover
lodgepole pine, black spruce

Shrub Layer: 30% cover
Rosa acicularis (prickly rose)
Shepherdia canadensis (soopolallie)
Vaccinium myrtilloides (velvet-leaved blueberry)
Lonicera involucrata (black twinberry)
Spiraea betulifolia (birch-leaved spirea)
Amelanchier alnifolia (saskatoon)
black spruce

Herb Layer: 40% cover
Cornus canadensis (bunchberry)
Linnaea borealis (twinline)
Vaccinium caespitosum (dwarf blueberry)
Fragaria virginiana (wild strawberry)
Oryzopsis asperifolia (rough-leaved ricegrass)
Epilobium angustifolium (fireweed)
Aster ciliolatus (fringed aster)

Moss Layer: 95% cover
Pleurozium schreberi (red-stemmed feathermoss)
Dicranum polysetum (wavy-leaved moss)

SOIL AND SITE

Moisture Regime: 3-5 (sm-shg)
Nutrient Regime: A-B (vp-p)
* Slope Gradient (%): 0-9
Slope Position: variable
Parent Material: (glacio)fluvial, morainal or lacustrine
Soil Texture: coarse - fine
Coarse Fragments (%): 0-88
* Root-restricting Layer: often present within 25 cm of humus/mineral soil interface

COMMENTS: these sites appear to be nutrient-poor because of restricted rooting, saturated soils in spring, and droughty conditions in late summer

DISTRIBUTION: common on level terrain

PlSb - Feathermoss (SBSdw3/05)

INTERPRETATIONS

- Site limitations:
- soils are saturated in the spring, but may experience drought in summer, both resulting in poor root development; ***the poor productivity resulting from these limitations should dictate a limited intensive silvicultural investment.***
 - compact soil layers and/or low aeration porosity associated with fine-textured soils will reduce rooting depth and decrease productivity over a rotation; ***regenerate naturally whenever possible.***
 - sites within this unit with medium to fine-textured lacustrine soils often have poor soil structure, leading to poor root growth; ***plant stock that will achieve better lateral root development (eg., Cu-treated), prescribe natural regeneration, or protect advance regeneration.***
- Silviculture system:
- see Section 5.1
 - minimize or align large slash accumulations when logging to help meet site preparation objectives and reduce fire hazard.
- Site preparation:
- see Section 5.2
- Species choice:
- Pl, (Sx, Sb)
- Vegetation potential:
- low
- Reforestation:
- attempt to regenerate naturally if potential exists.
 - if natural regeneration is not feasible, plant Pl.
 - Sx and Sb will generally be significantly less productive than Pl on these sites.
- Concerns:
- sites within this unit with shallow and/or coarse-textured soils are vulnerable to nutrient deficiency if forest floors are reduced; ***site preparation methods that reduce forest floor thickness, such as slashburning or brushblading, must be avoided.***
 - sites within this unit with fine-textured soils are vulnerable to compaction under wet conditions; ***restrict traffic to winter operations or dry soil conditions.***
 - comandra blister rust may cause cankers on pine if bastard toad-flax (*Geocaulon lividum*) occurs nearby.



Spiraea douglasii
ssp. *menziesii*



Petasites frigidus
var. *palmatus*



Lathyrus ochroleucus

VEGETATION

Tree Layer: 45% cover

lodgepole pine, trembling aspen, [black spruce]

Shrub Layer: 60% cover

Spiraea douglasii

ssp. *menziesii*

(pink spirea)

Rosa acicularis

(prickly rose)

Viburnum edule

(highbush-cranberry)

Lonicera involucrata

(black twinberry)

Shepherdia canadensis

(soopolallie)

Amelanchier alnifolia

(saskatoon)

hybrid white spruce

Herb Layer: 35% cover

Cornus canadensis

(bunchberry)

Rubus pubescens

(trailing raspberry)

Linnaea borealis

(twinline)

Petasites frigidus

var. *palmatus*

(palmate coltsfoot)

Lathyrus ochroleucus

(creamy peavine)

Calamagrostis canadensis

(bluejoint)

Fragaria virginiana

(wild strawberry)

Vaccinium caespitosum

(dwarf blueberry)

Aster ciliolatus

(fringed aster)

Epilobium angustifolium

(fireweed)

Pyrola asarifolia

(rosy wintergreen)

Moss Layer 95% cover

Pleurozium schreberi

(red-stemmed feathermoss)

Ptilium crista-castrensis

(knight's plume)

Peltigera aphthosa

(freckle lichen)

SOIL AND SITE

Moisture Regime:

4-5 (m-shg)

Nutrient Regime:

B-D (p-r)

* Slope Gradient (%):

0-10, usually < 5

Slope Position:

level

* Parent Material:

lacustrine

* Soil Texture:

moderately fine - fine

* Coarse Fragments (%):

generally 0

DISTRIBUTION: uncommon; often agricultural land

Sxw - Pink spirea - Prickly rose (SBSdw3/06)

INTERPRETATIONS

- Site limitations: - sites within this unit with medium- to fine-textured lacustrine soils often have poor soil structure, leading to poor root growth; **plant stock that will achieve better lateral root development (eg., Cu-treated), prescribe natural regeneration, or protect advance regeneration.**
- Silviculture systems: - see Section 5.1
- Site preparation: - see Section 5.2
- Species choice: - [Pl], Sx, **Fd, [Bl]**
- Vegetation potential: - moderate (trembling aspen, black twinberry, fireweed)
- Reforestation:
- a combination of poorly structured soils and frost make these sites difficult to regenerate, so if good quality advance regeneration is present it should be preserved during harvesting.
 - supplement advance regeneration by planting sturdy stock in groups on available raised microsites.
 - help maintain stand diversity on sites to be planted with Pl by mapping aspen patches prior to harvest and planting these areas to spruce.
 - young Bl regeneration (< 3 m tall) may be susceptible to heavy browsing by moose.
- Concerns:
- sites within this unit with fine-textured soils are very vulnerable to compaction under wet conditions; **restrict traffic to winter operations.**
 - site conditions may lead to frost damage of Sx and Fd regeneration, especially in any naturally occurring or artificially created depression; **leaving a partial canopy and/or choosing a frost-resistant species (eg., Pl) is advised.**
 - sites within this unit with silty soils are susceptible to frost-heaving; **bareroot stock will likely resist frost-heaving better than plug stock.**
 - if a root-restricting layer is present within 30 cm of surface then sites will have a high blowdown risk.
 - comandra blister rust may cause cankers on pine if bastard toad-flax (*Geocaulonlividum*) occurs nearby.
 - mountain pine beetle may cause mortality in large-diameter lodgepole pine stands of age class > 7.

VEGETATION

Tree Layer: 40% cover
hybrid white spruce, trembling aspen

Shrub Layer: 30% cover
Lonicera involucrata (black twinberry)
Viburnum edule (highbush-cranberry)
Rosa acicularis (prickly rose)
Ribes lacustre (black gooseberry)
Cornus stolonifera (red-osier dogwood)
hybrid white spruce

Herb Layer: 60% cover
Cornus canadensis (bunchberry)
Petasites frigidus
var. *palmatus* (palmate coltsfoot)
Rubus pubescens (trailing raspberry)
Linnaea borealis (twinflower)
Smilacina racemosa (false Solomon's seal)
Aster ciliolatus (fringed aster)
Mitella nuda (common mitrewort)

Moss Layer 95% cover
Hylocomium splendens (step moss)
Ptilium crista-castrensis (knight's plume)
Pleurozium schreberi (red-stemmed feathermoss)
Mnium spp. (leafy mosses)

SOIL AND SITE

Moisture Regime: 5 (shg)
Nutrient Regime: C-D (m-r)
* Aspect: flat or northerly
* Slope Gradient (%): 0-15, usually < 8
Slope Position: variable
Parent Material: lacustrine or occasionally morainal
Soil Texture: variable (not coarse)
Coarse Fragments (%): 0-36

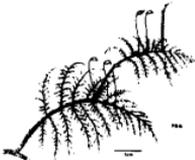
DISTRIBUTION: uncommon; often agricultural land or as small bands on lower slope positions



Lonicera involucrata



Petasites frigidus
var. *palmatus*



Hylocomium splendens

Sxw - Twinberry (SBSdw3/07)

INTERPRETATIONS

- Site limitations: - sites within this unit with medium to fine textured lacustrine soils often have poor soil structure, leading to poor root growth; **plant stock that will achieve better lateral root development (eg., Cu-treated), prescribe natural regeneration, or protect advance regeneration.**
- Silviculture systems: - see Section 5.1
- Site preparation: - see Section 5.2
- Species choice: - Pl, Sx, **Fd, [Bl]**
- Vegetation potential: - moderate (trembling aspen, black twinberry, fireweed)
- Reforestation:
- if vigorous advanced Fd or Sx regeneration is present, it should be preserved when feasible.
 - plant sturdy stock as soon after harvesting as possible.
 - plant Fd only on coarse-textured sites.
 - young Bl regeneration (< 3 m tall) may be susceptible to heavy browsing by moose.
 - help maintain stand diversity on sites to be planted with Pl by mapping aspen patches prior to harvest and planting these areas to spruce.
 - fill-planting will likely be required if a partial cutting silviculture system is used.
- Concerns:
- site conditions may lead to frost damage of Fd and Sx regeneration, especially in any naturally occurring or artificially created depression; **leaving a partial canopy and/or choosing a frost-resistant species (eg., Pl) is advised.**
 - sites within this unit with silty soils are susceptible to frost-heaving; **bareroot stock will likely resist frost-heaving better than plug stock.**
 - sites within this unit with fine-textured soils are vulnerable to compaction under wet conditions; **restrict traffic to winter operations or dry soil conditions.**
 - spruce weevil constitutes a moderate hazard in southeastern portion of subzone; **consider modifying brush treatments in localized areas with > 5% current attack.**
 - tomentosus root rot may cause moderate to severe problems in mature spruce-dominated stands.

VEGETATION

Tree Layer: 45% cover
hybrid white spruce, Douglas-fir, lodgepole pine

Shrub Layer: 40% cover
Viburnum edule (highbush-cranberry)
Lonicera involucrata (black twinberry)
Rosa acicularis (prickly rose)
Spiraea betulifolia (birch-leaved spirea)
subalpine fir
hybrid white spruce

Herb Layer: 75% cover
Gymnocarpium dryopteris (oak fern)
Cornus canadensis (bunchberry)
Aralia nudicaulis (wild sarsaparilla)
Mitella nuda (common mitrewort)
Rubus pubescens (trailing raspberry)
Orthilia secunda (one-sided wintergreen)

Moss Layer: 75% cover
Pleurozium schreberi (red-stemmed feathermoss)
Ptilium crista-castrensis (knight's plume)
Rhytidiadelphus triquetrus (electrified cat's-tail moss)
Mnium spp. (leafy mosses)

SOIL AND SITE

Moisture Regime: 5-6 (shg-hg)
Nutrient Regime: C-E (m-vr)
* Slope Gradient (%): 2-90 (rarely 0)
* Slope Position: lower - toe or mid if
northerly aspect
Parent Material: fluvial; rarely morainal or
lacustrine
Soil Texture: coarse; occasionally
moderately coarse or medium
Coarse Fragments(%): 0-70

COMMENTS: these sites are on warmer soils than the SBSdw3/06, which is reflected in better forest productivity

DISTRIBUTION: uncommon, and generally restricted to lower slopes



Lonicera involucrata



Gymnocarpium dryopteris



Pleurozium schreberi

Sxw - Oakfern (SBSdw3/08)

INTERPRETATIONS

- Site limitations: - sites within this unit with medium- to fine-textured lacustrine soils often have poor soil structure, leading to poor root growth; **plant stock that will achieve better lateral root development (eg., Cu-treated), prescribe natural regeneration, or protect advance regeneration.**
- Silviculture system: - see Section 5.1
- Site preparation: - see Section 5.2
- Species choice: - Pl, Sx, **Fd, [Bl]**
- Vegetation potential: - moderate (trembling aspen, black twinberry, prickly rose, fireweed)
- Reforestation:
- if vigorous advanced Fd or Sx regeneration is present, it should be preserved when feasible.
 - plant sturdy stock as soon after harvesting as possible.
 - Fd should only be planted on coarse-textured sites with low frost hazard.
 - young Bl regeneration (< 3 m tall) may be susceptible to heavy browsing by moose.
 - help maintain stand diversity on sites to be planted with Pl by mapping aspen patches prior to harvest and planting these areas to spruce.
 - fill-planting will likely be required if a partial cutting silviculture system is used.
- Concerns:
- site conditions may lead to frost damage of Fd regeneration, especially in any naturally occurring or artificially created depression; **leaving a partial canopy and/or choosing a frost-resistant species (eg., Pl) is advised.**
 - sites within this unit with fine-textured soils are vulnerable to compaction under wet conditions; **restrict traffic to winter operations or dry soil conditions.**
 - spruce weevil constitutes a moderate hazard in southeastern portion of subzone; **consider modifying brush treatments in localized areas with > 5% current attack.**
 - tomentosus root rot may cause moderate to severe problems in mature spruce-dominated stands.

VEGETATION

Tree Layer: 30% cover
hybrid white spruce

Shrub Layer: 20% cover

<i>Lonicera involucrata</i>	(black twinberry)
<i>Rosa acicularis</i>	(prickly rose)
<i>Ribes lacustre</i>	(black gooseberry)
<i>Vaccinium membranaceum</i>	(black huckleberry)
hybrid white spruce	

Herb Layer: 80% cover

<i>Equisetum arvense</i>	(common horsetail)
<i>Equisetum sylvaticum</i>	(wood horsetail)
<i>Rubus pubescens</i>	(trailing raspberry)
<i>Linnaea borealis</i>	(twinflower)
<i>Mitella nuda</i>	(common mitrewort)
<i>Galium triflorum</i>	(sweet-scented bedstraw)
<i>Cornus canadensis</i>	(bunchberry)
<i>Gymnocarpium dryopteris</i>	(oak fern)

Moss Layer: 65% cover

<i>Pleurozium schreberi</i>	(red-stemmed feathermoss)
<i>Hylocomium splendens</i>	(step moss)
<i>Ptilium crista-castrensis</i>	(knight's plume)
<i>Mnium</i> spp.	(leafy mosses)

SOIL AND SITE

Moisture Regime:	6 (hg)
Nutrient Regime:	B-E (p-vr)
* Slope Gradient (%):	0-4, usually 0
* Slope Position:	toe, depression (or level)
* Parent Material:	organic or fluvial
Soil Texture:	medium - coarse if mineral soil
Coarse Fragments (%):	0-27 (0 if organic)

COMMENTS: sites within this unit with deeper fluctuating water tables have upland humus forms and will be drier during the summer

DISTRIBUTION: common, but restricted to narrow bands along creeks and rivers or edges of wetlands



Lonicera involucrata



Equisetum arvense



Rubus pubescens

Sxw - Horsetail - Glowmoss (SBSdw3/09)

INTERPRETATIONS

- Site limitations:
- very difficult sites to manage; **serious consideration should be given to managing these sites as wildlife corridors.**
 - sites within this unit with saturated soils are poorly aerated, which slows root development; **plant seedlings on naturally or artificially raised microsites.**
- Silviculture system:
- see Section 5.1
- Site preparation:
- see Section 5.2
 - creating an excessive number of mounds (eg., >300/ha) should be avoided, especially on sites within this unit with a water table < 30 cm from the surface.
- Species choice:
- **Pl, Sx, [Bl]**
- Vegetation potential:
- high (black twinberry, fireweed, bluejoint)
- Reforestation:
- advanced regeneration should be preserved.
 - supplement advance regeneration by planting sturdy stock in groups, using available raised microsites.
 - young Bl regeneration (< 3 m tall) may be susceptible to heavy browsing by moose.
- Concerns:
- site conditions may lead to frost damage of Sx and Bl regeneration, especially in any naturally occurring or artificially created depression; **leaving a partial canopy and/or choosing a frost-resistant species (eg., Pl) is advised**
 - these units may represent important wildlife habitat; discuss prescription with wildlife personnel.
 - water table will likely rise above the ground surface in the spring, causing seedling mortality.
 - this unit is critical to the control of runoff streamflow.
 - sites with thick organic horizons (> 10 cm) will have an extreme windthrow hazard; **block layouts must have windfirm boundaries, or a wide buffer of standing timber must be left around such sites.**
 - spruce weevil constitutes a moderate hazard in southeastern portion of subzone; **consider modifying brush treatments in localized areas with > 5% current attack.**
 - tomentosus root rot may cause moderate to severe problems in mature spruce-dominated stands.
 - Warren's root collar weevil can cause mortality in young stands, especially where duff layers are thick.

VEGETATION

Tree Layer: 10% cover
black spruce, [tamarack]

Shrub Layer: 30% cover
Ledum groenlandicum (Labrador tea)
Lonicera involucrata (black twinberry)
Ribes hudsonianum (northern black currant)
black spruce

Herb Layer: 80% cover
Equisetum arvense (common horsetail)
Potentilla palustris (marsh cinquefoil)
Mitella nuda (common mitrewort)
Cornus canadensis (bunchberry)

Moss Layer: 65% cover
Pleurozium schreberi (red-stemmed feathermoss)
Sphagnum capillaceum (common red sphagnum)
Mnium spp. (leafy mosses)
Ptilium crista-castrensis (knight's plume)
Hylocomium splendens (step moss)

SOIL AND SITE

Moisture Regime: 7 (shd)
Nutrient Regime: A-D (vp-r)
* Slope Gradient (%): 0
* Slope Position: depression or level
* Parent Material: organic
Soil Texture: not applicable
Coarse Fragments (%): 0

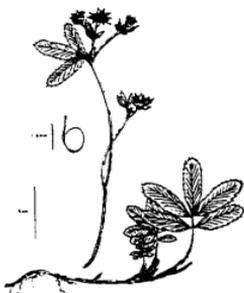
DISTRIBUTION: common, but usually small in size



Ledum groenlandicum



Equisetum arvense



Potentilla palustris

Sb - Soft-leaved sedge - Sphagnum (SBSdw3/10)

INTERPRETATIONS

Site limitations: - site and soil conditions of this unit result in marginal forest productivity; ***serious consideration should be given to excluding logging from this unit.***

Silviculture system: - avoid logging

APPENDIX 1. New names for biogeoclimatic and site units in the southwest portion of the Prince George Forest Region

Old Biogeoclimatic Units and Ecosystem Associations	New Biogeoclimatic Units and Site Series
SBSd	SBSdk
01 Mesic Rose - Peavine - Moss	01 Sxw - Spirea - Purple peavine
02 Pine - Lichen	02 Pl -Juniper - Ricegrass
03 Pine - Lichen - Moss	03 Pl - Feathermoss - Cladina
04 Saskatoon - Wheatgrass Scrub/Steppe	81 Saskatoon - Slender wheatgrass
05 Grasslands	82 Bluegrass - Slender wheatgrass
06 Douglas-fir - Soopolallie	04 Fd - Soopolallie - Feathermoss
07 Submesic Bunchberry - Moss	05 Sxw - Spirea - Feathermoss
08 Moist Shrub - Forb	06 Sxw - Twinberry - Coltsfoot
09 Spruce - Horsetail	07 Sxw - Horsetail
10 Cottonwood Bottomland	08 Act - Dogwood - Prickly rose
11 Spruce Swamps	10 Sb - Soft-leaved sedge - Sphagnum
12 Black Spruce Bogs	09 Sb - Creeping snowberry - Sphagnum
SBSk2	SBSdw2
01 Prickly rose - Bunchberry	01 SxwFd - Pinegrass
02 Douglas-fir - Lichen	02 FdPl - Cladonia
03 Pine - Velvet-leaved blueberry	03 Pl - Kinnikinnick - Wavy-leaved moss
04 Douglas-fir - Pinegrass	04 Fd - Pinegrass - Aster
05 Douglas-fir - Moss	05 SxwFd - Cat's-tail moss
06 Pinegrass - Moss	06 Pl - Pinegrass - Feathermoss
07 Pine - Black spruce	07 PlSb - Feathermoss
08 Black twinberry - Coltsfoot	08 Sxw - Twinberry
09 Devil's club - Oak fern	09 Sxw - Devil's club - Knight's plume
10 Spruce - Horsetail	10 Sxw - Horsetail
11 Bog Ecosystems	11 Sb - Soft-leaved sedge - Sphagnum
SBSk3	SBSdw3
01 Prickly rose - Queen's cup	01 SxwFd - Pinegrass
02 Douglas-fir - Kinnikinnick	02 FdPl - Cladonia
03 Pine - Soopolallie - Moss	03 Pl - Feathermoss - Cladina
04 Wild Sarsaparilla - Prince's pine	04 SxwFd - Ricegrass
05 Pine - Black spruce	05 PlSb - Feathermoss
No previous unit	06 Sxw - Pink spirea - Prickly rose
06 Black twinberry - Coltsfoot	07 Sxw - Twinberry
07 Black twinberry - Oak fern	08 Sxw - Oak fern
08 Spruce - Horsetail	09 Sxw - Horsetail - Glow moss
09 Bogs	10 Sb - Soft-leaved sedge - Sphagnum