

TABLE 8 Summary of climate data for biogeoclimatic units within the guide area^a

Climatic characteristics		ICH mm	ICH wk1	ICH wk3	SBS dh	SBS vk ^b	ESSF mm1	ESSF wk1 ^b	ESSF wc3 ^b
Annual precipitation (mm)	Mean	N/A	1214.1	N/A	609.4	1249.6	N/A	1043.9	1408.5
	Range	N/A	867.7–1725.4	N/A	503.1–678.5	989.7–1635.5	N/A	N/A	1177.1–1624.7
Growing-season precipitation (mm)	Mean	280.5	385.4	382.5	237.3	472.0	354.3	426.1	510.3
	Range	232.7–328.2	325.0–460.5	280.9–479.1	177.4–289.1	404.6–583.4	339.4–369.1	378.5–490.9	401.6–631.0
Annual snowfall (cm)	Mean	N/A	587.6	N/A	210.5	N/A	N/A	538.4	782.1
	Range	N/A	374.8–1090.0	N/A	180.3–234.8	N/A	N/A	N/A	N/A
Annual temperature (°C)	Mean	N/A	4.4	4.8	3.7	2.6	N/A	-0.1	-1.0
	Range	N/A	2.3–6.9	3.2–6.2	2.8–4.2	1.3–4.0	N/A	-1.5–1.4	-3.1–1.1
Growing degree-days (>5°C)	Mean	N/A	1364	n/a	1237	N/A	N/A	748	671
	Range	N/A	991–1808	n/a	1134–1332	N/A	N/A	N/A	N/A
Frost-free period (days)	Mean	N/A	121	N/A	92	N/A	N/A	48	75
	Range	N/A	104–149	N/A	76–116	N/A	N/A	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 For., Research Branch, Victoria, B.C. Unpublished report.

b The SBSvk, ESSFwk1, and ESSFwc3 are included for comparison. No long-term climate data exist for the ICHwk4 and ESSFwc2 biogeoclimatic units.

Handbook 29 (ESSFwk2, ESSFwc3), or from the Cariboo Region field guide (ICHwk4). The Alpine Tundra zone is not covered within this field guide as site units have not as yet been described.

TABLE 9 *Some important wildlife species that use biogeoclimatic units in the Rocky Mountain trench guide area*

	Occurrence in variants ^a					
	ICH mm	ICH wk1	ICH wk3	SBS dh	ESSF mm1	ESSF wc2
Moose (winter range)	M	M	M	H	–	–
Mule deer (winter range)	L	L	L	M	–	–
White-tailed deer	–	–	–	M	–	–
Elk	–	–	–	L	–	–
Caribou ^b	M	M	M	–	H	H
Grizzly bear ^b	H	H	H	M	VH	VH
Furbearers	M	M	M	H	H	H

a L = Low; M = Medium; H = High; VH = Very High

b 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.

4.4 Dry Hot Sub-Boreal Spruce

Location

The SBSdh is found in the valley of the Rocky Mountain Trench between Alberta and McBride, and the lower elevations of the northeast wall of the Rocky Mountain Trench between Valemount and Dunster.

Elevation range

The elevation ranges from a minimum of about 700 m along the Fraser River to approximately 1225 m.

Climate

The SBSdh is, in relative terms for the Prince George Region, dry and hot. It is the driest subzone in the Rocky Mountain Trench (Table 8), being especially dry during the summer months. The primary reason for the relatively dry climate is that the subzone lies in the rainshadow of the high mountains to the west (the Premier Range).

Forests

Because of the extensive fire history of the subzone, the dominant trees are lodgepole pine and Douglas-fir. Although they are primarily seral species in this subzone, they do form the climax canopy on drier sites. Hybrid white spruce and subalpine fir, and possibly Douglas-fir, are the climatic-climax tree species. Douglas-fir tends to be a component of near-climax stands for some time due to its long life, but it is unknown whether it can reproduce in perpetuity under a dense canopy in the subzone. Because of the fire history in the area, hybrid white spruce and subalpine fir climax stands are rare, only occurring as pure stands on wetter sites or on cooler northeast aspects. Although fires are now being suppressed, true climax stands will continue to be rare due to the intensive forest management, and consequently from a forest management perspective, Douglas-fir and lodgepole pine are definitely important components of all forest stands except the wettest sites.

Trembling aspen is often present as a seral component. Paper birch

and cottonwood are also seral components of some ecosystems. Black spruce is present on poorly to very poorly drained sites. Western redcedar occurs sporadically throughout the subzone, usually on wetter, cooler sites.

Soils, geology, and landforms

In this subzone, deep unconsolidated deposits cover the floor of the Rocky Mountain Trench and upper Fraser valley along the Yellowhead Highway. Surficial materials and soils consist predominantly of: clayey glaciolacustrine (Gray Luvisols), sandy terraced glaciofluvial (Ferro-Humic Podzols), sandy hummocky glaciofluvial (Dystric Brunisols), near Valemount and sandy morainal deposits (Humo-Ferric Podzols) east of Tete Jaune Cache along the Fraser Valley.

Distinguishing the SBSdh from adjoining biogeoclimatic units

ICHmm has:

- no prickly rose present in the shrub layer;
- less velvet-leaved blueberry present on dry sites;
- western hemlock and western redcedar present in the canopy of most sites;
- little or no Douglas-fir present in the canopy;
- devil's club present on mesic to hygric sites; and
- false azalea present in the shrub layer of most sites.

ESSFmm1 has:

- white-flowered rhododendron present on submesic to subhygric sites;
- no prickly rose present in the shrub layer;
- Engelmann spruce present in the canopy of most sites; and
- no kinnikinnick present in the herb layer.

SBSvk has:

- less prickly rose present on most sites;
- no kinnikinnick present in the herb layer;
- less Douglas-fir present on dry sites;
- more hybrid white spruce present in the canopy of submesic sites; and
- devil's club on mesic sites.

ICHwk3 has:

- devil's club present on submesic to hygric sites;
- false azalea present on subxeric to mesic sites;
- no prickly rose present on most sites;
- western hemlock and western redcedar present in the canopy of most sites;
- no Douglas-fir present in the canopy; and
- oak fern present in the herb layer of most sites.

Ecosystem management

Historically, these forest ecosystems experienced frequent wild-fires that ranged in size from small spot fires to conflagrations that covered hundreds to thousands of hectares. Natural burns usually contained unburned patches of mature forest that were missed by fire. Consequently, these forests produced a landscape mosaic of even-aged regenerating stands ranging in size from hundreds to thousands of hectares with mature forest remnants embedded within. There were also frequent outbreaks of defoliating insects and extensive presence of root disease. The tree mortality resulting from these biotic agents provided a source of dead trees, decaying logs, and canopy gaps. The frequency of stand-initiating disturbances was approximately 125 years. The extensive presence of Douglas-fir in the unit led to the creation of many mature remnants, with the result that structural diversity was increased.

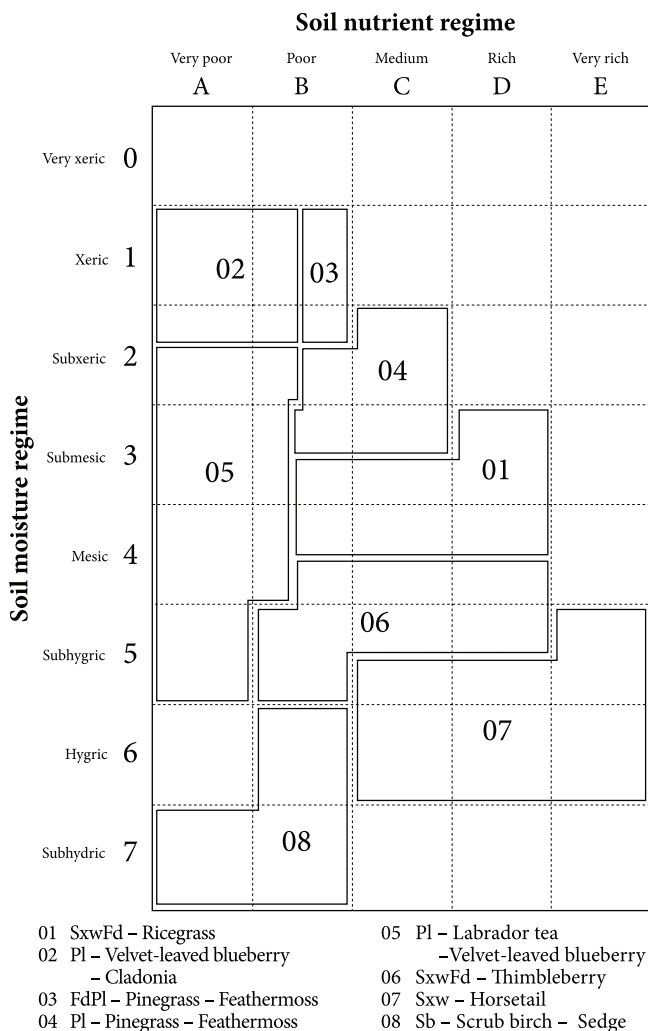


FIGURE 16 *Edatopic grid displaying site units in the SBSdh subzone.*

FIGURE 17 SBSdh vegetation table.

Site Series	02	03	04	05	01	06	07	08	
Trees									
<i>Pinus contorta</i>	■	■	■	■	■	■			lodgepole pine
<i>Pseudotsuga menziesii</i>		■	■		■	■			Douglas-fir
<i>Picea glauca</i> × <i>engelmannii</i>					■	■			hybrid white spruce
<i>Populus balsamifera</i> ssp. <i>trichocarpa</i>							■		black cottonwood
<i>Picea mariana</i>								■	black spruce
Shrubs									
<i>Vaccinium myrtilloides</i>	■		■	■	■	■			velvet-leaved blueberry
<i>Shepherdia canadensis</i>	■	■	■	■	■	■			soopolallie
<i>Spiraea betulifolia</i>	■	■	■	■					birch-leaved spirea
<i>Rubus parviflorus</i>					■	■			thimbleberry
<i>Cornus stolonifera</i>					■	■	■		red-osier dogwood
<i>Lonicera involucrata</i>						■	■		black twinberry
<i>Ledum groenlandicum</i>				■	■			■	Labrador tea
<i>Betula glandulosa</i>								■	scrub birch
Herbs and Dwarf Shrubs									
<i>Arctostaphylos uva-ursi</i>	■	■	■	■					kinnikinnick
<i>Calamagrostis rubescens</i>		■	■	■	■				pinegrass
<i>Vaccinium vitis-idaea</i>	■		■	■				■	lingonberry
<i>Linnaea borealis</i>			■	■	■	■			twinfleur
<i>Prosartes hookeri</i>					■	■			Hooker's fairybells
<i>Aralia nudicaulis</i>					■	■	■		wild sarsaparilla
<i>Maianthemum racemosum</i>					■	■	■		false Solomon's-seal
<i>Gymnocarpium dryopteris</i>							■		oak fern
<i>Carex</i> spp.								■	sedges
Mosses									
<i>Peltigera</i> spp.	■	■	■		■				peltigera lichens
<i>Pleurozium schreberi</i>	■	■	■	■	■	■	■	■	red-stemmed feathermoss
<i>Hylocomium splendens</i>		■	■	■	■	■	■		step moss
<i>Sphagnum</i> spp.								■	sphagnums

Prominence class: ■ 1 ■ 2 ■ 3 ■ 4 ■ 5

- 1a Black spruce dominant in canopy; organic soils; water table close to surface; *Sphagnum* spp. (p. 312–314)¹⁰ moderate to high cover (>10%); bogs. **SBSdh/o8**
- 1b Black spruce not dominant in canopy; mineral soils; water table variable; *Sphagnum* spp. absent.
- 2a Level, fluvial deposits close to streams; seepage water often present; hybrid white spruce or spruce-cottonwood canopy; *Equisetum* spp. (horsetails) (pp. 281–282) moderate to high cover (>10%). **SBSdh/o7**
- 2b Not on fluvial deposits close to streams; seepage water usually absent; canopy variable; *Equisetum* spp. absent.
- 3a Canopy dominated by a single species.
- 4a Main canopy all lodgepole pine or with minor (<5%) Douglas-fir.
- 5a Level; *Ledum groenlandicum* (Labrador tea) (p. 40) high cover (usually >10%). **SBSdh/o5**
- 5b Slope position variable; *Ledum groenlandicum* low cover (<2%) or absent.
- 6a *Shepherdia canadensis* (soopolallie) (p. 49) moderate to high cover (>5%); moss layer dominated by feathermosses. **SBSdh/o4**
- 6b *Shepherdia canadensis* low cover (<2%) or absent, moss layer dominated by lichens. **SBSdh/o2**
- 4b Main canopy dominated by Douglas-fir or hybrid white spruce.
- 7a Main canopy dominated by Douglas-fir.

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

8a Steep slope (>50%); mid- to upper slope; SE to SW aspect; lichens high cover (usually >10%).
SBSdh/o3

8b Slope usually less than 50%; mid-slope, or lower to level and coarse-textured; lichens low cover (<2%) or absent.
SBSdh/o1

7b Main canopy all hybrid white spruce (or may contain trembling aspen).

9a Lower slope to level; moderate to high shrub cover (>30%) dominated by *Rubus parviflorus* (thimbleberry) (p. 36), *Cornus stolonifera* (red-osier dogwood) (p. 48), *Viburnum edule* (high-bush-cranberry) (p. 35), and *Lonicera involucrata* (black twinberry) (p. 48).

SBSdh/o6

9b Often mid-slope; low to moderate shrub cover (<30%) dominated by *Spiraea betulifolia* (birch-leaved spirea) (p. 46) and *Rosa acicularis* (prickly rose) (p. 27).

SBSdh/o1

3b Main canopy mixed (lodgepole pine, Douglas-fir, hybrid white spruce, subalpine fir).

10a Steep slope (>50%), mid- to upper slope; SE to SW aspect; lichens high cover (>10%).

SBSdh/o3

10b Slope usually less than 50%; slope positions variable; aspect variable; lichens low cover (usually <5%) or absent.

11a Level, or mid- to upper slope; moderate to high cover (usually >5%) of *Shepherdia canadensis*.

SBSdh/o4

11b Level, or mid- to lower slope; *Shepherdia canadensis* low cover (<2%) or absent.

12a Lower slope to level; moderate to high shrub cover (>30%) dominated by *Rubus parviflorus*, *Cornus stolonifera*, *Viburnum edule*, and *Lonicera involucrata*.

SBSdh/o6

12b Often mid-slope; low to moderate shrub cover (<30%) dominated by *Spiraea betulifolia* and *Rosa acicularis*.

SBSdh/o1



*Spiraea
betulifolia*



*Chimaphila
umbellata*



*Pleurozium
schreberi*

VEGETATION

Tree Layer: 65% cover

Douglas-fir, lodgepole pine, hybrid white spruce,
[paper birch]

Shrub Layer: 20% cover

Spiraea betulifolia (birch-leaved spirea)
Rosa acicularis (prickly rose)
Rubus parviflorus (thimbleberry)
Viburnum edule (highbush-cranberry)
Amelanchier alnifolia (saskatoon)
 [*Vaccinium membranaceum* (black huckleberry)]
 [*Shepherdia canadensis* (soopolallie)]
 subalpine fir

Herb Layer: 50% cover

Orthilia secunda (one-sided wintergreen)
Chimaphila umbellata (prince's pine)
Linnaea borealis (twinflower)
Goodyera oblongifolia (rattlesnake-plantain)
Maianthemum racemosa (false Solomon's-seal)
Pyrola chlorantha (green wintergreen)
Cornus canadensis (bunchberry)
Aralia nudicaulis (wild sarsaparilla)
Oryzopsis asperifolia (rough-leaved ricegrass)
Maianthemum canadense (wild lily-of-the-valley)

Moss Layer: 45% cover

Pleurozium schreberi (red-stemmed feathermoss)
Rhytidiadelphus triquetrus (electrified cat's-tail moss)
Peltigera spp. (peltigera lichens)
Hylocomium splendens (step moss)
Dicranum polysetum (wavy-leaved moss)
Ptilium crista-castrensis (knight's plume)

SOIL AND SITE

Moisture Regime: 3-4 (submesic-mesic)

Nutrient Regime: B-D (poor-rich)

* Slope Gradient (%): 14 (0-55)

Slope Position: variable

Parent Material: commonly fluvial or morainal

* Soil Texture: medium-coarse

Coarse Fragments (%): 38 (0-77)

COMMENTS: toe to level slope positions have coarser-textured soils than mid-slope positions

DISTRIBUTION: common

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: – Fd, Pl, Sx, [Bl].
- Vegetation potential: – low/moderate (thimbleberry, fireweed).
- Reforestation: – if Fd stems are present, conduct a stand evaluation to assess if a partial-cutting system is feasible.
– if a partial-cutting system is used and abundant advance Fd regeneration is present, attempt to log in a manner that protects this regeneration.
– maintain Fd component, especially veterans that are valuable for wildlife and seed production.
– attempt to preserve advance Fd regeneration when partial cutting.
– fill-planting may be required to meet stocking requirements if a partial-cutting system is used.
– young Bl regeneration (<3 m tall) may be susceptible to heavy browsing by moose.
- 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.**
– full tree harvesting will lead to nutrient depletion and seriously reduce cones; **woody debris and cones should be distributed across these sites (i.e., lop and scatter).**

VEGETATION

Tree Layer: 35% cover
lodgepole pine

Shrub Layer: 15% cover

Vaccinium myrtilloides (velvet-leaved blueberry)
[*Shepherdia canadensis* (soopolallie)]
lodgepole pine
[subalpine fir]

Herb Layer: 20% cover

Arctostaphylos uva-ursi (kinnikinnick)
Melampyrum lineare (cow-wheat)
[*Cornus canadensis* (bunchberry)]
[*Chimaphila umbellata* (prince's pine)]

Moss Layer: 60% cover

Cladina spp. (reindeer lichens)
Peltigera spp. (peltigera lichens)
Cladonia spp. (cladonia lichens)
Dicranum polysetum (wavy-leaved moss)
Pleurozium schreberi (red-stemmed feathermoss)
Stereocaulon spp. (coral lichens)

SOIL AND SITE

Moisture Regime: 1–2 (xeric–subxeric)
Nutrient Regime: A–B (very poor–poor)
Slope Gradient (%): 7 (0–15)
Slope Position: variable
* Parent Material: glaciofluvial or aeolian
* Soil Texture: coarse
Coarse Fragments (%): 16 (0–80)

COMMENTS: moss layer of these sites is dominated by lichens

DISTRIBUTION: common



*Arctostaphylos
uva-ursi*

Cladina spp.

Peltigera spp.

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.

VEGETATION

Tree Layer: 50% cover
Douglas-fir, lodgepole pine

Shrub Layer: 15% cover
Spiraea betulifolia (birch-leaved spirea)
Shepherdia canadensis (soopolallie)
Rosa acicularis (prickly rose)
[*Alnus crispa* ssp. *sinuata*] (Sitka alder)
Douglas-fir

Herb Layer: 20% cover
Calamagrostis rubescens (pinegrass)
Arctostaphylos uva-ursi (kinnikinnick)
Solidago spathulata (spike-like goldenrod)
Aster conspicuus (showy aster)
Campanula rotundifolia (common harebell)
[*Leymus innovatus*] (fuzzy-spiked wildrye)
[*Piptatherum pungens*] (short-awned ricegrass)]

Moss Layer: 35% cover
Pleurozium schreberi (red-stemmed feathermoss)
Dicranum polysetum (wavy-leaved moss)
Ptilium crista-castrensis (knight's plume)
Polytrichum juniperinum (juniper haircap moss)
Cladina spp. (cladina lichens)

SOIL AND SITE

Moisture Regime: 1–2 (xeric–subxeric)
Nutrient Regime: B (poor)
* Aspect: southerly
* Slope Gradient (%): 66 (56–75)
* Slope Position: mid- to upper
Parent Material: colluvial or glaciofluvial
* Soil Texture: coarse–medium
Coarse Fragments (%): 52 (0–80)

DISTRIBUTION: rare



*Shepherdia
canadensis*



*Calamagrostis
rubescens*



*Pleurozium
schreberi*

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 PI cones and/or leaving Fd seed trees on site.***
- Silviculture system: – see Section 5.1.
– avoid clearcutting, because stand establishment would likely be difficult due to high surface soil temperatures and drought.
- Site preparation: – light scarification for seedbed preparation or summer logging with no site preparation.
- Species choice: – ***Fd, Lw, (Pw).***
- Vegetation potential: – low.
- Reforestation: – manage to maintain Fd component.
– fill-planting may be required after partial cutting.
- Concerns: – these units represent important wildlife habitat; ***discuss prescription with fish and wildlife personnel.***
– 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.***
– site and soil conditions of this unit result in drought hazard for a significant portion of the growing season; ***leaving a shelterwood overstorey 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.***
– Pw will be subject to blister rust-induced mortality; ***Pw should only be considered on a trial basis or as a minor component in the southern portion of the subzone.***
– Lw is extended beyond its normal range and should be used only on a trial basis.

VEGETATION

Tree Layer: 45% cover
lodgepole pine, [Douglas-fir]

Shrub Layer: 35% cover
Shepherdia canadensis (soopolallie)
Spiraea betulifolia (birch-leaved spirea)
Vaccinium myrtilloides (velvet-leaved blueberry)
Rosa acicularis (prickly rose)
Amelanchier alnifolia (saskatoon)
 Douglas-fir
 [subalpine fir]
 [hybrid white spruce]



*Shepherdia
canadensis*

Herb Layer: 50% cover
Linnaea borealis (twinflower)
Chimaphila umbellata (prince's pine)
Cornus canadensis (bunchberry)
Maianthemum canadense (wild lily-of-the-valley)
Orthilia secunda (one-sided wintergreen)
Goodyera oblongifolia (rattlesnake-plantain)
Arctostaphylos uva-ursi (kinnikinnick)
Leymus innovatus (fuzzy-spiked wildrye)
Melampyrum lineare (cow-wheat)
Oryzopsis asperifolia (rough-leaved ricegrass)
 [Calamagrostis rubescens] (pinegrass)]



*Linnaea
borealis*

Moss Layer: 80% cover
Pleurozium schreberi (red-stemmed feathermoss)
Dicranum polysetum (wavy-leaved moss)
Peltigera spp. (peltigera lichens)
Hylocomium splendens (step moss)

*Dicranum
polysetum*

SOIL AND SITE

Moisture Regime: 2–3 (subxeric–submesic)
 Nutrient Regime: B–C (poor–medium)
 Slope Gradient (%): 3 (0–14)
 * Slope Position: mid- to upper, or level
 Parent Material: fluvial, morainal
 * Soil Texture: moderately coarse–coarse
 Coarse Fragments (%): 38 (0–85)

DISTRIBUTION: very common

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 PI 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, PI, (Sx).
- Vegetation potential: – low (fireweed, pinegrass).
- Reforestation: – if Fd stems are present, conduct a stand evaluation to assess if a partial-cutting system is feasible.
– if a partial-cutting system is used and abundant advance Fd regeneration is present, attempt to log in a manner that protects this regeneration.
– fill-planting may be required after partial cutting.
– if natural regeneration is not feasible, plant PI.
– Sx will be significantly less productive than Fd or PI 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 (i.e., lop and scatter).**
– 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.**
– 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.**
– PI may be at high risk to dwarf mistletoe infection.

VEGETATION

Tree Layer: 50% cover
lodgepole pine

Shrub Layer: 65% cover

<i>Ledum groenlandicum</i>	(Labrador tea)
<i>Vaccinium myrtilloides</i>	(velvet-leaved blueberry)
<i>Shepherdia canadensis</i>	(soopolallie)
<i>Salix</i> spp.	(willows)
<i>Rosa acicularis</i>	(prickly rose)
<i>Spiraea betulifolia</i>	(birch-leaved spirea)
lodgepole pine	
trembling aspen	
hybrid white spruce	



*Ledum
groenlandicum*



*Vaccinium
vitis-idaea*

Herb Layer: 50% cover

<i>Vaccinium vitis-idaea</i>	(lingonberry)
<i>Cornus canadensis</i>	(bunchberry)
<i>Arctostaphylos uva-ursi</i>	(kinnikinnick)
<i>Linnaea borealis</i>	(twinline)
<i>Diphasiastrum complanatum</i>	(ground-cedar)
<i>Maianthemum canadense</i>	(wild lily-of-the-valley)
<i>Oryzopsis asperifolia</i>	(rough-leaved ricegrass)
<i>Lathyrus ochroleucus</i>	(creamy peavine)

Moss Layer: 95% cover

<i>Pleurozium schreberi</i>	(red-stemmed feathermoss)
<i>Dicranum polysetum</i>	(wavy-leaved moss)
<i>Peltigera</i> spp.	(peltigera lichens)
<i>Hylocomium splendens</i>	(step moss)

*Diphasiastrum
complanatum*

SOIL AND SITE

Moisture Regime:	2–5 (subxeric–subhygric)
Nutrient Regime:	A–B (very poor–poor)
Slope Gradient (%):	1 (0–2)
* Slope Position:	level
* Parent Material:	fluvial
* Soil Texture:	coarse
Coarse Fragments (%):	1 (0–2)

DISTRIBUTION: uncommon

INTERPRETATIONS

- Site limitations: – sites within this unit with coarse soils will have significantly reduced soil moisture and soil nutrient retention; **attempt to regenerate naturally by retaining PI cones 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: – see Section 5.2.
- Species choice: – PI, (Sb, Sx).
- Vegetation potential: – low.
- Reforestation: – attempt to regenerate naturally if potential exists.
– if natural regeneration is not feasible, plant PI.
– Sx and Sb will generally be less productive than PI 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 (i.e., lop and scatter).**
– site conditions may lead to frost damage of regeneration, especially in any naturally occurring or artificially created depression; **leaving a partial canopy, planting on raised microsites, and/or choosing a frost-resistant species (e.g., PI) are advised.**
– 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: 65% cover

hybrid white spruce, trembling aspen, Douglas-fir,
[lodgepole pine, subalpine fir, paper birch]*Rubus
parviflorus**Aralia
nudicaulis**Prosartes
hookeri*

Shrub Layer: 45% cover

<i>Rubus parviflorus</i>	(thimbleberry)
<i>Cornus stolonifera</i>	(red-osier dogwood)
<i>Viburnum edule</i>	(highbush-cranberry)
<i>Lonicera involucrata</i>	(black twinberry)
<i>Spiraea betulifolia</i>	(birch-leaved spirea)
<i>Amelanchier alnifolia</i>	(saskatoon)
<i>Rosa acicularis</i>	(prickly rose)
<i>Vaccinium myrtilloides</i>	(velvet-leaved blueberry)
<i>Menziesia ferruginea</i>	(false azalea)

subalpine fir
hybrid white spruce

Herb Layer: 55% cover

<i>Aralia nudicaulis</i>	(wild sarsaparilla)
<i>Linnaea borealis</i>	(twinflower)
<i>Orthilia secunda</i>	(one-sided wintergreen)
<i>Cornus canadensis</i>	(bunchberry)
<i>Maianthemum racemosa</i>	(false Solomon's-seal)
<i>Maianthemum canadense</i>	(wild lily-of-the-valley)
<i>Galium triflorum</i>	(sweet-scented bedstraw)
<i>Prosartes hookeri</i>	(Hooker's fairybells)
<i>Oryzopsis asperifolia</i>	(rough-leaved ricegrass)
<i>Chimaphila umbellata</i>	(prince's pine)

Moss Layer: 40% cover

<i>Pleurozium schreberi</i>	(red-stemmed feathermoss)
<i>Rhytidiadelphus triquetrus</i>	(electrified cat's-tail moss)
[<i>Ptilium crista-castrensis</i>	(knight's plume)]
[<i>Hylocomium splendens</i>	(step moss)]

SOIL AND SITE

Moisture Regime:	4-5 (mesic-subhygric)
Nutrient Regime:	B-D (poor-rich)
* Slope Gradient (%):	6 (0-13)
* Slope Position:	lower to level
Parent Material:	variable
Soil Texture:	variable
Coarse Fragments (%):	16 (0-40)
* Seepage Water:	may be present

DISTRIBUTION: common, especially on sites that receive limited seepage

INTERPRETATIONS

- Site limitations: – sites 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 (e.g., Cu-treated), prescribe natural regeneration, or protect advance regeneration.**
- Silviculture system: – see Section 5.1.
- Site preparation: – see Section 5.2.
- Species choice: – Fd, Sx, [Pl, **Bl**].
- Vegetation potential: – moderate (black twinberry, thimbleberry, fireweed).
- Reforestation: – if Fd stems are present, conduct a stand evaluation to assess if a partial-cutting system is feasible.
– if a partial-cutting system is used and abundant advance Fd regeneration is present, attempt to log in a manner that protects this regeneration.
– maintain Fd component, especially veterans that are valuable for wildlife and seed production.
– young Bl regeneration (<3 m tall) may be susceptible to heavy browsing by moose.
- Concerns: – sites within this unit with fine-textured soils are vulnerable to compaction under wet conditions; **restrict traffic to winter operations or dry soil conditions.**
– sites within this unit with thick organic horizons (>10 cm) have increased windthrow hazard; **block layouts must have windfirm boundaries, or a wide buffer of standing timber must be left around such sites.**

VEGETATION

Tree Layer: 65% cover

hybrid white spruce, black cottonwood, [subalpine fir]

Shrub Layer: 35% cover

<i>Cornus stolonifera</i>	(red-osier dogwood)
<i>Viburnum edule</i>	(highbush-cranberry)
<i>Lonicera involucrata</i>	(black twinberry)
<i>Rosa acicularis</i>	(prickly rose)
<i>Rubus idaeus</i>	(red raspberry)

Herb Layer: 60% cover

<i>Galium triflorum</i>	(sweet-scented bedstraw)
<i>Equisetum arvense</i>	(common horsetail)
<i>Cornus canadensis</i>	(bunchberry)
<i>Aralia nudicaulis</i>	(wild sarsaparilla)
<i>Maianthemum racemosa</i>	(false Solomon's-seal)
<i>Rubus pubescens</i>	(trailing raspberry)
<i>Petasites frigidus</i> var. <i>palmatus</i>	(palmate coltsfoot)
<i>Mitella nuda</i>	(common mitrewort)
<i>Orthilia secunda</i>	(one-sided wintergreen)
<i>Gymnocarpium dryopteris</i>	(oak fern)

Moss Layer: 30% cover

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

SOIL AND SITE

Moisture Regime:	5-6 (subhygric-hygric)
Nutrient Regime:	C-E (medium-very rich)
* Slope Gradient (%):	0 (0-2)
* Slope Position:	level
* Parent Material:	fluvial
Soil Texture:	medium-coarse
Coarse Fragments (%):	18 (0-86)
* Seepage Water:	often present

COMMENTS: these sites often have a fluctuating water table**DISTRIBUTION:** common, but small in area; occurs along rivers and creeks

Cornus stolonifera



Equisetum arvense



Rhytidiadelphus triquetrus

INTERPRETATIONS

- Site limitations:
- very difficult sites to manage; ***serious consideration should be given to managing these sites as wildlife corridors.***
 - sites within this unit are subject to periodic flooding; ***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 microsites (e.g., >300/ha) should be avoided, especially on sites with a water table <30 cm from the surface.
- Species choice:
- ***Fd, Pl, Sx, [Bl].***
- Vegetation potential:
- very high (black twinberry, lady fern, fireweed).
- Reforestation:
- careful assessment of plantable and preparable raised microsites should be made to determine target stocking levels.
 - young Bl regeneration (<3 m tall) may be susceptible to heavy browsing by moose.
 - advance regeneration should be preserved.
 - supplement advance regeneration by planting sturdy stock in groups, using available microsites.
- Concerns:
- site conditions may lead to frost damage of regeneration, especially in any naturally occurring or artificially created depression; ***leaving a partial canopy, planting on raised microsites, and/or choosing a frost-resistant species (e.g., Pl) are advised.***
 - sites within this unit with thick organic horizons (>10 cm), in conjunction with high water tables, have increased windthrow hazard; ***block layouts must have wind-firm boundaries, or a wide buffer of standing timber must be left around such sites.***
 - this unit is critical to the control of runoff streamflow.
 - these units represent important wildlife habitat; ***discuss prescription with fish and wildlife personnel.***
 - sites with thick organic horizons reduce spring soil temperatures, slowing root development; ***attempt to reduce organic horizon thickness during site preparation.***

VEGETATION

Tree Layer: 15% cover
black spruce, [lodgepole pine]

Shrub Layer: 65% cover

Ledum groenlandicum (Labrador tea)
Betula glandulosa (scrub birch)
Salix spp. (willows)
Rosa acicularis (prickly rose)
black spruce



Betula glandulosa



Carex spp.



Sphagnum spp.

Herb Layer: 60% cover

Carex spp. (sedges)
Oxycoccus oxycoccus (bog cranberry)
Drosera rotundifolia (round-leaved sundew)
Smilacina trifolia (three-leaved false Solomon's-seal)
Vaccinium vitis-idaea (lingonberry)
Rubus arcticus (dwarf nagoonberry)
[*Calamagrostis canadensis*] (bluejoint)
[*Potentilla palustris*] (marsh cinquefoil)]

Moss Layer: 95% cover

Sphagnum spp. (sphagnums)
Tomentypnum nitens (golden fuzzy fen moss)
Aulacomnium palustre (glow moss)
Pleurozium schreberi (red-stemmed feathermoss)
Polytrichum strictum (bog haircap moss)

SOIL AND SITE

Moisture Regime: 7 (subhydric)
Nutrient Regime: A–C (very poor–medium)
* Slope Gradient (%): 0 (0–2)
* Slope Position: level or depression
Parent Material: organic
Coarse Fragments (%): 0
* Water Table: close to surface

DISTRIBUTION: common

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.