TABLE 4.1 *Summary of climate data for biogeoclimatic units within the Southeast guide area*[a]

Climatic characteristics		Biogeoclimatic unit							
		SBSdw1	**SBSmw**	**SBSmh**	**SBSwk1**	**SBSvk**	**ICHvk2**	**ESSFwk1**	**ESSFwc3**
Annual precipitation (mm)	Mean	585	N/A[b]	559	931	1247	840	1044	1408
	Range	520–739	N/A	528–601	897–964	990–1635	N/A	N/A	1177–1625
Growing season precipitation (mm)	Mean	286	290	257	345	472	466	426	510
	Range	227–401	276–306	214–287	181–437	405–583	374–538	378–491	402–631
Annual snowfall (cm)	Mean	182	N/A	197	334	N/A	307	538	782
	Range	180–183	N/A	166–226	328–339	N/A	N/A	N/A	N/A
Annual temperature (°C)	Mean	3.7	N/A	4.6	2.6	2.6	3.3	-0.1	-1.0
	Range	3.1–4.2	N/A	4.2–5.0	1.3–4.0	1.3–4.0	3.1–3.4	-1.5–1.4	-3.1–1.1
Growing degree days (>5°C)	Mean	1224	N/A	1428	N/A	N/A	1133	748	671
	Range	1160–1287	N/A	1342–1510	N/A	N/A	N/A	N/A	N/A
Frost-free period (days)	Mean	68	N/A	112	N/A	N/A	72	48	75
	Range	49–86	N/A	104–119	N/A	N/A	N/A	N/A	N/A

[a] Reynolds (1989).
[b] N/A = Not available.

TABLE 4.2 *Some important wildlife species that use biogeoclimatic units in the Southeast guide area*

Species	Occurrence in variants							
	SBSdw1	**SBSmw**	**SBSmh**	**SBSwk1**	**SBSvk**	**ICHvk2**	**ESSFwk1**	**ESSFwc3**
Mountain Goat							*	*
Caribou[a]				*	*	*	*	
Elk		*		*		*		
Moose	*	*	*	*	*	*		
Mule Deer	*	*	*	*	*	*	*	*
White-tailed Deer	*							
Grizzly Bear[a]				*	*	*	*	*
Wolverine[a]					*		*	*

[a] Denotes species "Blue Listed" in 1989 by the Ministry of Environment. Because of major declines in their populations, these species are considered sensitive and/or deserving of management attention (B.C. Ministry of Environment 1987).

10 VERY WET COOL INTERIOR CEDAR–HEMLOCK (ICHvk2)

Variant Summary

Location
The ICHvk2 occurs at medium elevations in the valleys of the Fraser River (from around Dome Creek to the Sinclair Mills area), the Torpy River and West Torpy River, in portions of the upper McGregor River, and Slim Creek, and on the slopes around Sugarbowl Mountain and near Purden Lake. This variant is bordered at lower elevations generally by the SBSvk, in its westernmost areas by the SBSwk1, and at higher elevations by the ESSFwk1 in the south and by the ESSFwk2 in the north.

Elevation range
680–1180 m

Climate
The ICHvk2 has more yearly precipitation and lower temperatures than the dry and moist variants of the SBS, and less yearly precipitation and higher temperatures than the wet and very wet variants of the SBS and the two ESSF variants within the guide area. The ICHvk2 also has moderate to high levels of precipitation during the growing season compared with other biogeoclimatic units within the guide area (see Table 4.1).

Distinguishing the ICHvk2 from adjoining biogeoclimatic units
The ICHvk2 is the only biogeoclimatic unit in the guide area dominated by western redcedar and western hemlock.

SBSvk has:
- less western hemlock and western redcedar across all sites; and
- less black huckleberry on submesic sites.

SBSwk1 has:
- less devil's club and lady fern on mesic sites; and
- less skunk cabbage on hygric sites.

ESSFwk1 has:
- more white-flowered rhododendron on submesic and mesic sites;
- no Douglas-fir on subxeric to submesic sites; and
- more lodgepole pine on subxeric and submesic sites.

ESSFwk2 has:
- more white-flowered rhododendron across all sites; and
- less devil's club on mesic sites.

Forests
Forests of the ICHvk2 are primarily mature to old-growth and are dominated by western redcedar and western hemlock, with hybrid white spruce also prominent on all but nutrient-poor very dry and very wet sites. Douglas-fir occurs on the driest sites, while black spruce and lodgepole pine dominate nutrient-poor wetlands. Deciduous stands are relatively rare.

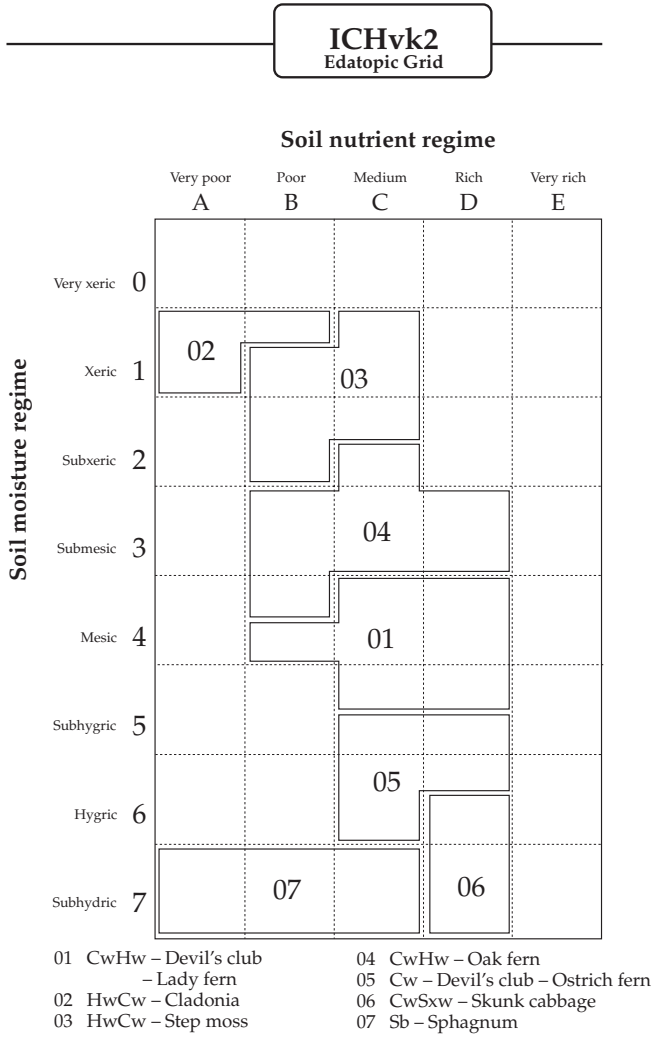


FIGURE 10.1 *Edatopic grid displaying site units of the ICHvk2 variant.*

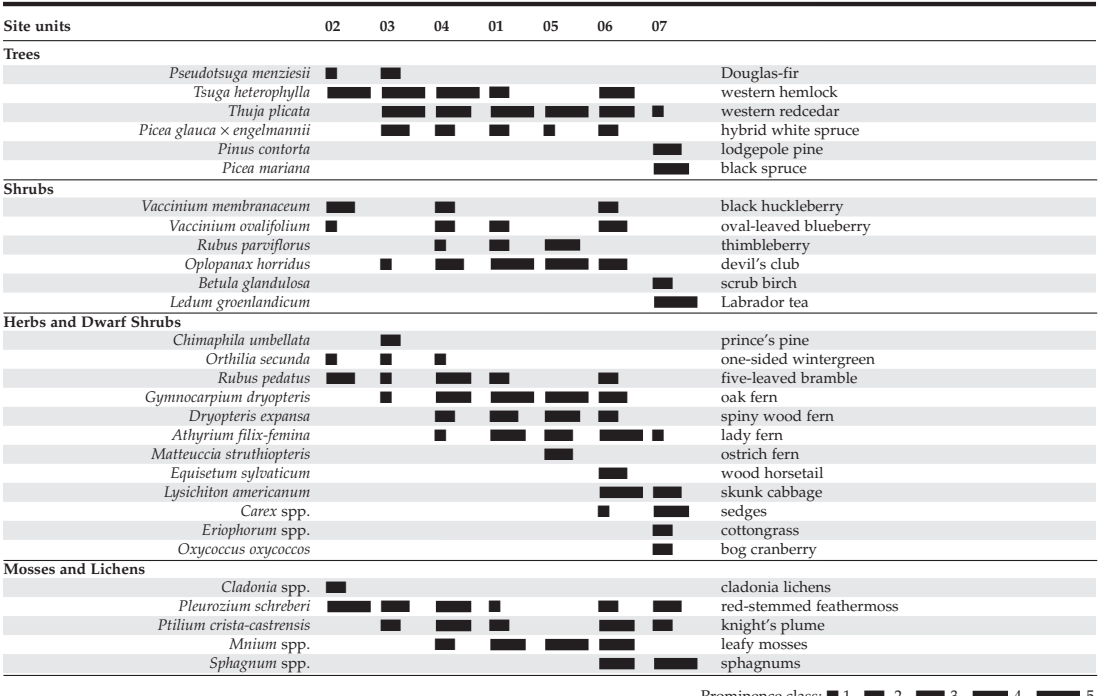


FIGURE 10.2 *ICHvk2 vegetation table.*

Site Series Key

1a Black spruce–lodgepole pine canopy; organic or lacustrine soils; *Carex* spp. (sedges) (pp. 258–274)[1] high cover (>10%).

ICHvk2/07

1b Western redcedar or western hemlock canopy; mineral soil; *Carex* spp. low cover (<1%) or absent.

2a *Oplopanax horridus* (devil's club) (p. 36) moderate to high cover (>15%).

3a *Matteuccia struthiopteris* (ostrich fern) (p. 291) moderate cover (>5%); water table usually close to surface; fluvial material.

ICHvk2/05

3b *Matteuccia struthiopteris* absent; seepage water may be present below 50 cm; parent material variable.

ICHvk2/01

2b *Oplopanax horridus* low to moderate cover (<15%) or absent.

4a *Oplopanax horridus* absent; very shallow soil on rock outcrop; open tree canopy; *Cladonia* spp. (cladonia lichens) (p. 332–334) often present.

ICHvk2/02

4b *Oplopanax horridus* low to moderate cover (<15%); deeper soils; closed tree canopy; *Cladonia* spp. often absent.

5a *Lysichiton americanum* (skunk cabbage) (p. 224) moderate to high cover (>15%); *Alnus incana* ssp. *tenuifolia* (mountain alder) (p. 38) low to moderate cover (<15%); narrow drainage channel, water table close to surface.

ICHvk2/06

5b *Lysichiton americanum* and *Alnus incana* ssp. *tenuifolia* absent; not in drainage channel, seepage water not present.

6a Bedrock within 40 cm of surface; *Rubus pedatus* (five-leaved bramble) (p. 92) low cover (<5%); *Vaccinium membranaceum* (black huckleberry) (p. 42) low cover (<1%).

ICHvk2/03

6b Bedrock at depths >40 cm (usually 1 m); *Rubus pedatus* and *Vaccinium membranaceum* moderate cover (>1%).

ICHvk2/04

[1] Page numbers refer to the publication *Plants of Northern British Columbia* (MacKinnon et al. [editors] 1992).

ICHvk2/01 CwHw – DEVIL'S CLUB – LADY FERN

Oplopanax horridus

VEGETATION

Tree Layer: 60% cover
western redcedar, [western hemlock, hybrid white spruce, subalpine fir]

Shrub Layer: 55% cover

Oplopanax horridus	(devil's club)
Ribes lacustre	(black gooseberry)
Rubus parviflorus	(thimbleberry)
Acer glabrum	(Douglas maple)
Vaccinium ovalifolium	(oval-leaved blueberry)
western redcedar	
[subalpine fir]	

Herb Layer: 65% cover

Gymnocarpium dryopteris	(oak fern)
Athyrium filix-femina	(lady fern)
Rubus pedatus	(five-leaved bramble)
Cornus canadensis	(bunchberry)
Smilacina racemosa	(false Solomon's-seal)
Galium triflorum	(sweet-scented bedstraw)
Dryopteris expansa	(spiny wood fern)
Streptopus roseus	(rosy twistedstalk)
Tiarella trifoliata	(foamflower)
Goodyera oblongifolia	(rattlesnake plantain)
Circaea alpina	(enchanter's nightshade)

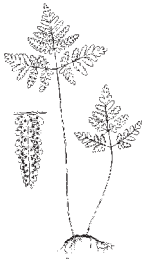
Moss Layer: 25% cover

Mnium spp.	(leafy mosses)
[*Hylocomium splendens*	(step moss)]
[*Ptilium crista-castrensis*	(knight's plume)]

Rubus parviflorus

SOIL AND SITE:

Moisture Regime:	4–5 (mesic-subhygric)
Nutrient Regime:	B-D (poor-rich)
Slope Gradient (%):	0–26
*Slope Position:	variable, commonly mid
Parent Material:	variable
Soil Texture:	variable
Coarse Fragments (%):	0–95



Gymnocarpium dryopteris

DISTRIBUTION: very common

ICHvk2/01 **CwHw – DEVIL'S CLUB – LADY FERN**

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; ***promote natural Hw and Cw regeneration and/or leave Fd seed trees on site.***

Site preparation:
- see Section 12.1

Species choice:
- Sx, Cw, [***Fd, Pl***], (***Hw, Bl***)

Vegetation potential:
- high (fireweed, thimbleberry, lady fern)
- prescription must address vegetation competition.

Reforestation:
- preserve vigorous advance Sx regeneration.
- restrict planting of Fd and Pl to coarser-textured sites.
- plant sturdy stock immediately after harvesting.
- Pl may be susceptible to snow damage; choose appropriate seed source.
- Hw and Bl are significantly less productive than other species on these sites.

Concerns:
- 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.***
- sites with thick organic horizons (>10 cm) reduce spring soil temperatures, slowing root development; ***attempt to reduce organic horizon thickness during site preparation.***
- 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.***
- site conditions leading to cold air ponding will lead to frost damage of Fd and Sx regeneration; ***leaving a partial canopy and/or choosing a frost-resistant species (e.g., Pl) are advised.***
- advance Hw and Cw regeneration are suspected to have a high risk of heart rot.
- high risk of weevil damage to Sx especially in pure stands.

ICHvk2/02 HwCw – CLADONIA

Vaccinium membranaceum

VEGETATION

Tree Layer: 25% cover
western hemlock, [western redcedar, Douglas-fir]

Shrub Layer: 30% cover

Vaccinium membranaceum	(black huckleberry)
Sorbus sitchensis	(Sitka mountain-ash)
Rhododendron albiflorum	(white-flowered rhododendron)
Vaccinium ovalifolium	(oval-leaved blueberry)
western hemlock	
western redcedar	

Herb Layer: 10% cover

Rubus pedatus	(five-leaved bramble)
Cornus canadensis	(bunchberry)
Orthilia secunda	(one-sided wintergreen)
Moneses uniflora	(single delight)

Rubus pedatus

Moss Layer: 95% cover

Pleurozium schreberi	(red-stemmed feathermoss)
Barbilophozia floerkei	(mountain leafy liverwort)
Dicranum pallidisetum	(pale-stalked broom-moss)
Hylocomium splendens	(step moss)
Cladonia spp.	(cladonia lichens)
Barbilophozia lycopodioides	(common leafy liverwort)

Pleurozium schreberi

SOIL AND SITE:

Moisture Regime:	1 (xeric)
Nutrient Regime:	A-B (very poor-poor)
Slope Gradient (%):	16–27
*Slope Position:	upper to crest
*Parent Material:	very shallow veneer over bedrock
*Soil Texture:	medium to coarse
Coarse Fragments (%):	15–98

COMMENTS: this ecosystem is found on very shallow soils over rock outcrops; there is usually a moderate cover of rocks and stones on the surface

DISTRIBUTION: rare

ICHvk2/02 **HwCw – CLADONIA**

INTERPRETATIONS

Site limitations:
- site and soil conditions of this unit result in marginal forest productivity; ***seriously consider excluding logging from this unit.***
- sites within this unit with high coarse fragment content (>70%) will have significantly reduced soil moisture retention and will be extremely difficult to plant; ***promote natural regeneration of Hw and/or leave Fd seed trees on site.***

Silvicultural system:
- assess partial cutting feasibility if Fd is present.
- minimize or align large slash accumulations when logging to help meet site preparation objectives.

Site preparation:
- light scarification for seedbed preparation or summer logging with no site preparation.

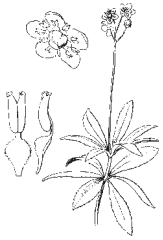
Species choice:
- Fd, ***Hw***, [***Pl***], (***Cw***, Sx)

Vegetation potential:
- low

Reforestation:
- attempt to regenerate naturally if potential exists.
- if natural regeneration is not feasible, plant Fd or Pl stock without site preparation.
- Cw, Hw, and Sx are generally not as productive as other tree species.

Concerns:
- sites within this unit with shallow and/or coarse-textured soils are vulnerable to nutrient deficiency if forest floors are reduced; ***avoid site preparation methods that reduce forest floor thickness, such as slashburning or brushblading.***
- full tree harvesting may lead to nutrient depletion and seriously reduce the number and distribution of cones; ***distribute woody debris and cones across these sites (i.e., lop and scatter).***
- advance Hw and Cw regeneration are suspected to have a high risk of heart rot.
- heavy snowpack may cause stem deformity of Pl, especially on steep slopes.

ICHvk2/03 HwCw – STEP MOSS



Chimaphila umbellata

VEGETATION

Tree Layer: 60% cover
western redcedar, western hemlock, Douglas-fir, hybrid white spruce, subalpine fir

Shrub Layer: 30% cover

Oplopanax horridus	(devil's club)
Acer glabrum	(Douglas maple)
Ribes lacustre	(black gooseberry)
western redcedar	
western hemlock	
subalpine fir	

Herb Layer: 20% cover

Cornus canadensis	(bunchberry)
Orthilia secunda	(one-sided wintergreen)
Goodyera oblongifolia	(rattlesnake-plantain)
Chimaphila umbellata	(prince's pine)
Clintonia uniflora	(queen's cup)
Smilacina racemosa	(false Solomon's-seal)
Tiarella trifoliata	(foamflower)

Cornus canadensis

Moss Layer: 80% cover

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

SOIL AND SITE:

Moisture Regime:	1–2 (xeric-subxeric)
Nutrient Regime:	B-C (poor-medium)
Slope Gradient (%):	0–76
*Slope Position:	mid to crest
*Parent Material:	colluvial or morainal veneer over bedrock
*Soil Texture:	moderately coarse to coarse
Coarse Fragments (%):	43–91

Hylocomium splendens

COMMENTS: the soils are shallow (25–50 cm), but deeper than ICHvk2/02; moderate to low cover of cobbles and stones on surface of site

DISTRIBUTION: uncommon

ICHvk2/03 **HwCw – STEP MOSS**

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; ***promote natural regeneration of Hw and/or leave Fd seed trees on site.***

Silvicultural system: – 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*], (Bl, Sx, ***Cw, Hw***)

Vegetation potential: – low

Reforestation: – manage to maintain Fd component.

– promote natural Fd and Hw regeneration by light scarification or spot screefing.

– Cw, Bl, and Sx will be significantly less productive than Fd or 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; ***avoid site preparation methods that reduce forest floor thickness, such as slashburning or brushblading.***

– full tree harvesting may lead to nutrient depletion and seriously reduce numbers of the number and distribution of cones; ***distribute woody debris and cones across these sites (i.e., lop and scatter).***

– heavy snowpack may cause stem deformity of Pl, especially on steep slopes.

– advance Hw and Cw regeneration are suspected to have a high risk of heart rot.

ICHvk2/04 CwHw – OAK FERN

Oplopanax horridus

VEGETATION

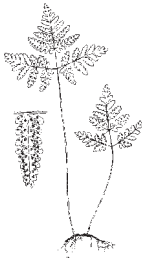
Tree Layer: 70% cover
western hemlock, western redcedar, subalpine fir, [hybrid white spruce]

Shrub Layer: 30% cover

Oplopanax horridus	(devil's club)
Vaccinium ovalifolium	(oval-leaved blueberry)
Vaccinium membranaceum	(black huckleberry)
[*Rubus parviflorus*	(thimbleberry)]
western hemlock	
western redcedar	

Herb Layer: 60% cover

Gymnocarpium dryopteris	(oak fern)
Rubus pedatus	(five-leaved bramble)
Cornus canadensis	(bunchberry)
Tiarella trifoliata	(foamflower)
Streptopus spp.	(twistedstalks)
Lycopodium annotinum	(stiff clubmoss)
Dryopteris expansa	(spiny wood fern)
Clintonia uniflora	(queen's cup)
Orthilia secunda	(one-sided wintergreen)



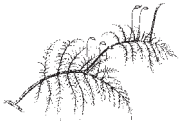
Gymnocarpium dryopteris

Moss Layer: 90% cover

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

SOIL AND SITE:

Moisture Regime:	2–4 (subxeric-mesic)
Nutrient Regime:	B-D (poor-rich)
Slope Gradient (%):	0–51
Slope Position:	variable
Parent Material:	variable
* Soil Texture:	medium to coarse
Coarse Fragments (%):	0–87



Hylocomium splendens

COMMENTS: medium-textured soils usually compensated by other factors (steep slope, coarse fragments, shallow depth of soil)

DISTRIBUTION: common

ICHvk2/04 **CwHw – OAK FERN**

INTERPRETATIONS

Site limitations: – sites 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.***

Site preparation: – see Section 12.1

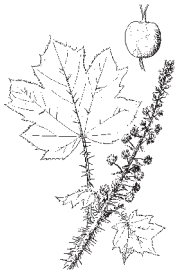
Species choice: – Sx, [Bl, ***Fd, Pl***], (***Cw, Hw***)

Vegetation potential: – low to moderate

Reforestation:
- manage to maintain Fd component.
- promote natural Fd and Hw regeneration by light scarification or spot screefing.
- plant Fd or Pl to augment natural regeneration.
- Cw, Bl, and Sx will be significantly less productive than Fd or 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; ***avoid site preparation methods that reduce forest floor thickness, such as slashburning or brushblading.***
- heavy snowpack may cause stem deformity of Pl, especially on steep slopes.
- advance Hw and Cw regeneration are suspected to have a high risk of heart rot.
- sites with shallow (<30 cm) effective rooting depth have increased windthrow hazard; ***block layouts must have windfirm boundaries, or a wide buffer of standing timber must be left around such sites.***

ICHvk2/05 Cw – DEVIL'S CLUB – OSTRICH FERN



Oplopanax horridus

VEGETATION

Tree Layer: 70% cover
western redcedar, black cottonwood, hybrid white spruce, paper birch, subalpine fir

Shrub Layer: 80% cover

Oplopanax horridus	(devil's club)
Rubus parviflorus	(thimbleberry)
Ribes lacustre	(black gooseberry)
Acer glabrum	(Douglas maple)
[*Cornus stolonifera*	(red-osier dogwood)]
[*Corylus cornuta*	(beaked hazelnut)]
western redcedar	

Herb Layer: 80% cover

Gymnocarpium dryopteris	(oak fern)
Circaea alpina	(enchanter's nightshade)
Dryopteris expansa	(spiny wood fern)
Athyrium filix-femina	(lady fern)
Tiarella trifoliata	(foamflower)
Matteuccia struthiopteris	(ostrich fern)
Equisetum pratense	(meadow horsetail)
Mitella nuda	(common mitrewort)
Cornus canadensis	(bunchberry)
Smilacina racemosa	(false Solomon's-seal)
Streptopus spp.	(twistedstalks)

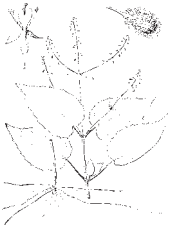
Tiarella trifoliata

Moss Layer: 25% cover

Mnium spp.	(leafy mosses)
[*Brachythecium* spp.	(ragged mosses)
[*Timmia austriaca*	(false polytrichum)]

SOIL AND SITE:

Moisture Regime:	5–6 (subhygric-hygric)
Nutrient Regime:	C-D (medium-rich)
Slope Gradient (%):	2–3
*Slope Position:	mid to level
*Parent Material:	fluvial
*Soil Texture:	medium to coarse
Coarse Fragments (%):	14–38



Circaea alpina

COMMENTS: based on few plots; generally on floodplains

DISTRIBUTION: rare

ICHvk2/05 **Cw – DEVIL'S CLUB – OSTRICH FERN**

INTERPRETATIONS

Site limitations:
- sites within this unit with saturated soils are poorly aerated, which slows root development; ***plant seedlings on naturally or artificially raised microsites.***

Site preparation:
- see Section 12.1
- avoid creating an excessive number of mounds (e.g., >300/ha), especially on sites within this unit with a water table <30 cm from the surface.
- carefully assess plantable and preparable raised microsites to determine target stocking levels.

Species choice:
- ***Bl, Sx, [Pl], (Cw, Hw)***

Vegetation potential:
- very high (fireweed, thimbleberry, lady fern)
- prescription must address vegetation competition.

Reforestation:
- preserve advance regeneration when feasible.
- plant sturdy stock in groups, using available raised microsites, rather than evenly across the site.
- young Bl regeneration (<3 m tall) may be susceptible to heavy browsing by moose.

Concerns:
- sites within this unit with high water tables, combined with thick organic horizons (>10 cm), increase the windthrow hazard; ***block layouts must have windfirm boundaries, or a wide buffer of standing timber must be left around such sites.***
- 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.***
- water table will likely rise above ground surface in spring, causing seedling mortality on non-elevated sites.
- site conditions leading to cold air ponding will lead to frost damage of regeneration; ***leaving a partial canopy and/or retaining Ac if present are advised.***
- advance Hw and Cw regeneration are suspected to have a high risk of heart rot.

ICHvk2/06 CwSxw – SKUNK CABBAGE

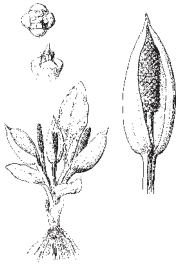
Vaccinium ovalifolium

VEGETATION

Tree Layer: 35% cover
western hemlock, western redcedar, subalpine fir, hybrid white spruce

Shrub Layer: 45% cover

Vaccinium ovalifolium	(oval-leaved blueberry)
Oplopanax horridus	(devil's club)
Ribes lacustre	(black gooseberry)
Alnus incana ssp. *tenuifolia*	(mountain alder)
Vaccinium membranaceum	(black huckleberry)
western hemlock	
western redcedar	
subalpine fir	



Lysichiton americanum

Herb Layer: 75% cover

Lysichiton americanum	(skunk cabbage)
Athyrium filix-femina	(lady fern)
Gymnocarpium dryopteris	(oak fern)
Equisetum sylvaticum	(wood horsetail)
Glyceria elata	(tall mannagrass)
Valeriana sitchensis	(Sitka valerian)
Circaea alpina	(enchanter's nightshade)
Rubus pedatus	(five-leaved bramble)
Dryopteris expansa	(spiny wood fern)
Tiarella trifoliata	(foamflower)

Moss Layer: 70% cover

Sphagnum spp.	(sphagnum mosses)
Mnium spp.	(leafy mosses)
Ptilium crista-castrensis	(knight's plume)
Hylocomium splendens	(step moss)
Pellia neesiana	(shiny liverwort)
Pleurozium schreberi	(red-stemmed feathermoss)

Athyrium filix-femina

SOIL AND SITE:

Moisture Regime:	6–7 (hygric-subhydric)
Nutrient Regime:	D (rich)
*Slope Gradient (%):	2–11
*Slope Position:	lower or depression, in narrow drainage channels
Parent Material:	fluvial and lacustrine
Soil Texture:	variable
Coarse Fragments (%):	0–23; commonly zero

DISTRIBUTION: uncommon

ICHvk2/06 **CwSxw – SKUNK CABBAGE**

INTERPRETATIONS

Site limitations: – site and soil conditions of this unit result in marginal forest productivity; ***seriously consider excluding logging from this unit.***

Silvicultural system: – avoid logging.

ICHvk2/07 **Sb – SPHAGNUM**

Ledum groenlandicum

Carex spp.

Sphagnum spp.

VEGETATION

Tree Layer: 15% cover
black spruce, lodgepole pine

Shrub Layer: 50% cover

Ledum groenlandicum	(Labrador tea)
Betula glandulosa	(scrub birch)
Kalmia microphylla ssp. *occidentalis*	(bog-laurel)
[*Potentilla palustris*	(marsh cinquefoil)]

black spruce
lodgepole pine

Herb Layer: 70% cover

Carex spp.	(sedges)
Oxycoccus oxycoccos	(bog cranberry)
Rubus chamaemorus	(cloudberry)
Eriophorum spp.	(cottongrasses)
[*Menyanthes trifoliata*	(buckbean)]

Moss Layer: 95% cover

Sphagnum spp.	(sphagnum mosses)

SOIL AND SITE:

Moisture Regime:	7 (subhydric)
Nutrient Regime:	A-C (very poor-medium)
*Slope Gradient (%):	0–1
*Slope Position:	lower to depressional
Parent Material:	organic, organic over lacustrine, and lacustrine
Soil Texture:	fibric to mesic (organic) and moderately fine to fine (mineral)
Coarse Fragments (%):	0

COMMENTS: a variety of wetland bog ecosystems have been grouped together in this unit. They range from nutrient poor Labrador tea–Sphagnum bogs to bogs with improved nutrient status dominated by scrub birch, Labrador tea, buckbean, skunk cabbage, sedges, and sphagnum mosses.

DISTRIBUTION: uncommon

ICHvk2/07 **Sb – SPHAGNUM**

INTERPRETATIONS

Site limitations: – site and soil conditions of this unit result in marginal forest productivity; ***seriously consider excluding logging from this unit.***

Silvicultural system: – avoid logging.

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

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

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

TABLE 5.2.2 *Fen Species Importance Table*

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

General Description

The Scrub birch – Water sedge Fen Site Association is one of the most common peatland Site Associations throughout the Interior and is absent only from PP/BG and wet ESSF subzones. It is frequently a major component of large peatlands where there is some watertable fluctuation and the surface becomes aerated by mid-season. These sites are often hummocked, with shrubs rooting on elevated microsites.

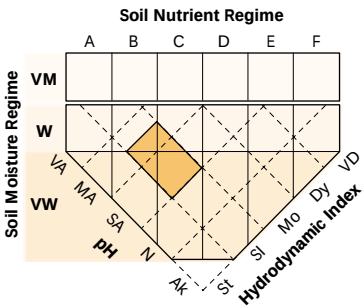
Betula nana and *Carex aquatilis* are the characteristic species but *Salix pedicellaris* and *Carex utriculata* dominate on wetter sites. The moss layer is variable and can be diverse, absent, or dominated by *Tomentypnum nitens*, *Sphagnum*, or *Drepanocladus*. Some drier sites will have scattered, stunted trees (spruce or black spruce most commonly).

Common soil types are terric and typic Mesisols and Fibrisols. Peat depths are frequently between 1 and 2 m but deep sedge-derived peat to 4 m occurs; this Site Association can occassionally occur on thin organic veneers.

Characteristic Vegetation

Tree layer (0 - **0** - 10)
Shrub layer (10 - **35** - 100)
Betula nana, *Salix pedicellaris*
Herb layer (5 - **60** - 100)
Carex aquatilis, ***C. utriculata***, *Comarum palustre*
Moss layer (0 - **70** - 100)
Aulacomnium palustre, Drepanocladus aduncus, Sphagnum Group I, ***Tomentypnum nitens***

Wetland Edatopic Grid



Comments

*The **Wf02** Site Association often occurs around the periphery of the wetter **Wf01** or adjacent to the drier **Wb05**. These three Site Associations may represent a sequence of long-term peatland succession. Many sites have a moss layer with rich and poor site indicators, suggesting that they are in transition from fen to bog conditions.*

*The **Wf02** is one of the most common Interior peatland community types at low to subalpine elevations. It is probably only absent from the AT, BG, and PP zones. In coastal areas, similar sites are occupied by the **Wf52**.*

TABLE 5.4.1 *Distribution of Swamp Site Associations by biogeoclimatic zone*

		BG PP	BWBS SWB	ESSF	ICH	IDF	MS	SBPS SBS	CDF	CWH	MH
Ws01	Mountain alder – Skunk cabbage – Lady fern				xx			xx^{w}			
Ws02	Mountain alder – Pink spirea – Sitka sedge		x	x	xx	x	x	x^{w}		x	
Ws03	Bebb's willow – Bluejoint	x	xx			xx	x	xx			
Ws04	Drummond's willow – Beaked sedge				x	x	x	xx			
Ws05	MacCalla's willow – Beaked sedge					x		x			
Ws06	Sitka willow – Sitka sedge				xx			x^{w}			
Ws07	Spruce – Common horsetail – Leafy moss		xx	x	xx	xx	xx	xxx			
Ws08	Subalpine fir – Sitka valerian – Common horsetail			xx							
Ws09	Black spruce – Skunk cabbage – Peat-moss				xx			x^{w}			
Ws10	Western redcedar – Spruce – Skunk cabbage				xx						
Ws11	Spruce – Subalpine fir – Skunk cabbage							x^{w}			
Ws50	Pink spirea – Sitka sedge				x			x^{w}	xxx	xx	
Ws51	Sitka willow – Pacific willow – Skunk cabbage				x				x	x	
Ws52	Red alder – Skunk cabbage								xx	xx	
Ws53	Western redcedar – Sword fern – Skunk cabbage								x	x^{x}	
Ws54	Western redcedar – Western hemlock – Skunk cabbage								x	xx	
Ws55	Yellow-cedar – Mountain hemlock – Skunk cabbage										xx

x = incidental; < 5% of wetlands xx = minor; 5–25% of wetlands xxx = major; >25% of wetlands
w = wet subzones only x = very dry subzones only

TABLE 5.4.2 *Swamp Species Importance Table*

	Species	Ws03	Ws04	Ws05	Ws02	Ws06	Ws07	Ws08	Ws01
Trees	*Picea* X								
	Picea mariana								
	Abies lasiocarpa								
	Tsuga heterophylla								
	Thuja plicata								
	Picea sitchensis								
	Alnus rubra								
	Acer macrophyllum								
	Chamaecyparis nootkatensis								
	Tsuga mertensiana								
	Abies amabilis								
Shrubs	*Salix bebbiana*								
	Salix drummondiana								
	Salix maccalliana								
	Alnus incana								
	Lonicera involucrata								
	Spiraea douglasii								
	Cornus stolonifera								
	Vaccinium alaskaense/ovalifolium								
	Salix sitchensis								
	Salix lucida								
	Rubus spectabilis								
	Sambucus racemosa								
	Gaultheria shallon								
	Ribes bracteosum								
	Elliottia pyroliflorus								
Herbs and Dwarf Shrubs	*Calamagrostis canadensis*								
	Carex aquatilis/sitchensis								
	Carex utriculata								
	Gymnocarpium dryopteris								
	Valeriana sitchensis								
	Scirpus microcarpus								
	Equisetum arvense								
	Lysichiton americanus								
	Athyrium filix-femina								
	Tiarella trifoliata								
	Streptopus lanceolatus								
	Maianthemum dilatatum								
	Oenanthe sarmentosa								
	Polystichum munitum								
	Equisetum telmateia								
	Blechnum spicant								
	Veratrum viride								
	Fauria crista-galli								
Mosses and Lichens	*Drepanocladus* spp.								
	Mnium spp.								
	Aulacomnium palustre								
	Sphagnum spp.								
	Hylocomium splendens								
	Pleurozium schreberi								
	Eurhynchium praelongum								
	Rhytidiadelphus loreus								

Alnus incana – Lysichiton americanus – Athyrium filix-femina

General Description

Mountain alder – Skunk cabbage – Lady fern swamps are common in wet regions of the Sub-Boreal Interior and Southern Interior Mountains, particularly in areas underlain by glaciolacustrine deposits. The **Ws01** frequently occurs in wet gullies or along small creeks where there is continuous seepage near the surface and poor drainage. It also occurs in the lagg of peatlands, where seepage from upslope enriches peat deposits.

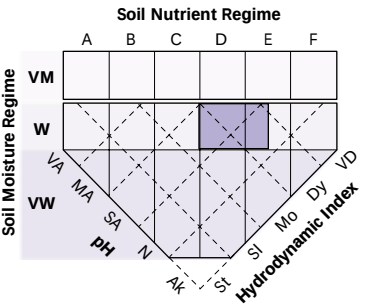
Alnus incana dominates these sites, which have a lush and diverse understorey where *Athyrium filix-femina* and *Lysichiton americanus* are prominent. Scattered spruce is common. The moss layer is often sparse because of shading and high rates of litterfall.

Soils are usually poorly drained, fine-textured mineral deposits with a veneer of well-humified woody peat. Occasionally this unit will occur on deeper peat deposits.

Characteristic Vegetation

Tree layer (0 - **5** - 8)
Picea X
Shrub layer (20 - **53** - 99)
Alnus incana, *Lonicera involucrata*, *Picea* X, ***Spiraea douglasii***
Herb layer (35 - **68** - 95)
Athyrium filix-femina, *Calamagrostis canadensis*, *Equisetum arvense*, ***Lysichiton americanus***
Moss layer (0 - **24** - 87)
***Mnium* spp**.

Wetland Edatopic Grid



Comments

*Several other mountain alder–dominated Site Associations occur. The **Fl01** and **Fl02** occur on well-drained soils adjacent to streams and rivers; these sites lack skunk cabbage. On wetter sites,* Carex sitchensis *is dominant in the understorey and described by the **Ws02**.*

*The **Ws01** often fully occupies small depressions and gullies in upland forest. It also occurs between sedge fens and upland forest.*