TABLE 6.1 Selected wildlife species by subzone and variant[a]

Species / Status[b]		Degree of old-growth need[c]	PP dh1	PP dh2	MS dm	MS dk	IDF xh	IDF dm1	IDF dm2	ICH dw, xw	ICH mk	ICH mw	ICH wk	ESSF dk, dc	ESSF wm, wc, vc
AMPHIBIANS															
Coeur d'Alene salamander	B									y[d]					
Ensatina salamander	G	a					y								
Tailed frog	B	a									y				
Tiger salamander	B						Y	Y							
REPTILES															
Gopher snake	B		Y				Y								
Night snake	B						y								
Western rattlesnake	B		Y				Y			y					
Painted turtle	Y		Y	Y			Y	Y	Y	Y	Y	Y	y		
MAMMALS															
Badger	B		y	y	y	y	Y	Y	Y	y	y	y	y	y	y
Big brown bat	G	a	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Bighorn sheep	Y			pw	y	Psaw	PW	Y	Y	y	s			Y	s
Black bear	Y	a	y	y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Bobcat	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Caribou	B	d				w						sW	Y	PsAW	Y
Cascade mantled ground squirrel	R	a			y		y	y						y	
Cougar	Y		y	y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Coyote	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Elk	Y		Y	Y	s	Y	y	Y	Y	Y	Y	Sy	y	PSAw	SA
Fisher	B	a			Y	Y	Y		Y		y	y	y	Y	Y

TABLE 6.1. (Continued)

Species / Status[b]	Degree of old-growth need[c]	PP dh1	PP dh2	MS dm	MS dk	IDF xh	IDF dm1	IDF dm2	ICH dw, xw	ICH mk	ICH mw	ICH wk	ESSF dk, dc	ESSF wm, wc, vc
MAMMALS														
Gray wolf	Y	y	y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Great Basin pocket mouse	B	Y												
Grizzly bear	B	a		y	PSAw	p	p	p	Psaw	y	y	Y	SAW	SAW
Long-legged myotis	G	a	S	S		S	S	S	S	S	S	S	S	S
Lynx	Y		y	y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Marten	Y	d	y	y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Moose	Y	a			Y	Y	PsAW		Y	y	Y	Y	y	pSAw	pSAw
Mountain goat	Y	a			y	PsAW	y		w			Y		Y	Y
Mule deer	Y	a	PsAW		PSAW	Y	Y	Y	Y	Y	S	Sw	S	SA	SA
Northern flying squirrel	G	a			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Northern long-eared myotis	B	a										s	s		S
Porcupine	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red-tailed chipmunk	B					Y				Y	y	Y			
River otter	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Silver-haired bat	Y	a	S	S	S	S	S	S	S	Y	Y	Y	Y	S	S
Southern red-backed vole	G	a			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Townsend's big-eared bat	R		S				S	S		y	y	y			
White-tailed deer	Y		Y	Y	PSA	Y	Y	Y	Y	Y	S	S	s	PSA	PSA
Wolverine	Y	a	y	y	y	y	Y	Y	Y	y	y	y	y	y	y

TABLE 6.1. (Continued)

Species / Status[b]	Degree of old-growth need[c]	PP dh1	PP dh2	MS dm	MS dk	IDF xh	IDF dm1	IDF dm2	ICH dw, xw	ICH mk	ICH mw	ICH wk	ESSF dk, dc	ESSF wm, wc, vc
BIRDS														
American Avocet B		p		p		ps	p	p						
American White Pelican R		sm			sM	sM	sm		sm					
Anna's Hummingbird B					aw	sw	w		pw					
Arctic Tern B					sa	a								
Bald Eagle B	a	swM	ps	ps	swM	swM	swM	sM	swM	Psa	ps	ps		
Barn Owl Y					y	s			psw					
Barred Owl G	a	pw			y	y	y	a	y	a				
Barrow's Goldeneye Y	a	SwM	sm	sm	SwM	SwM	SwM	sm	y	y	sm	sm		
Black-backed Woodpecker G	a	y	y	y	y	y	y	y	y	y	y	y		
Black-chinned Hummingbird B					ps	ps	ps		ps					
Black-crowned Night Heron B					sm		s	ps						
Blue Grouse Y	a	y	y	y	y	y	y	y	y	y	y	y		
Bobolink B		ps		s	ps	ps	ps	ps	ps					
Boreal Owl G	a		a	a			p		p		y	y		
Brewer's Sparrow B		ps			ps	ps	ps							
Brown Creeper G	a	y	y	y	y	y	y	y	y	y	y	y		
Bufflehead Y	a	SwM	SwM	SwM	SwM	SwM	SwM	sm	SwM	ps	ps	ps		
Burrowing Owl R		wm			y	a								
California Gull B		sa			Y	ps	sm	sm	PSa w	sa				
Canyon Wren R		y			sm		y							

TABLE 6.1. (Continued)

Species / Status[b]	Degree of old-growth need[c]	PP dh1	PP dh2	MS dm	MS dk	IDF xh	IDF dm1	IDF dm2	ICH dw, xw	ICH mk	ICH mw	ICH wk	ESSF dk, dc	ESSF wm, wc, vc
BIRDS														
Caspian Tern	B					ps			ps					
Chestnut-backed Chickadee	G	a		y	y				Y	y	Y	Y		
Clark's Nutcracker	G	a	AW	psAW	psAW	sMW	sMW		psAW	psAW	psAW	y	y	y
Common Merganser	Y	a	SwM	sm	sm	SwM	SwM		PSaw	SwM	SwM	sm	ps	ps
Common Poorwill	R		s			sm	s		ps					
Flammulated Owl	B	a	a	ps		s	sm						s	
Forster's Tern	R					sm			PSa					
Grasshopper Sparrow	B					sm	ps							
Gray Jay	G	a	w	y	y	y	y		y	y	y	y	y	y
Great Blue Heron	B	a	Y	s	s	Y	Y		SwM	sa	SwM	sa		
Great Gray Owl	G	a	y	s		y	y			w	w			
Green-backed Heron	B						s		p					
Gyrfalcon	B					wm	wm			a				
Hairy Woodpecker	G	a	y	y	y	y	y		y	y	y	y	ps	ps
Hermit Thrush	G	a	sm	sa	sa	sm	sm		sm	sm	sm	sm	s	s
Hooded Merganser	Y	a	SwM	sm	sm	SwM	SwM		PSaw	SwM	SwM	sm	ps	ps
Hudsonian Godwit	B				s	a	p							
Least Sandpiper	B		sm	a	a	sm	sm		a	a	a	a	a	a
Le Conte's Sparrow	B						s							

TABLE 6.1. (Continued)

Species / Status[b]	Degree of old-growth need[c]	PP dh1	PP dh2	MS dm	MS dk	IDF xh	IDF dm1	IDF dm2	ICH dw, xw	ICH mk	ICH mw	ICH wk	ESSF dk, dc	ESSF wm, wc, vc
BIRDS														
Lesser Golden-plover B		m				m	m		a		a			
Lewis' Woodpecker B	a	sm				SwM	sm		sm	sm	sm	a		
Long-billed Curlew B		ps				psa	ps		ps					
Merlin G	a	y		sm	sm	y	y		y	y	y	sm	sm	sm
Northern Goshawk G	a	y		y	y	y	y		y	y	y	y	y	y
Northern Shrike B		mw		mw	mw	y	y		mw	mw	mw	mw	a	a
Olive-sided Flycatcher G	a			ps	ps	sm	sm			ps	ps	ps	s	s
Osprey Y	a	PSa		ps	ps	PSaw	PSa		SwM	ps	PSaw	sm		
Pacific Loon B		swm		s		swm	swm		swm	sm	swm	sm	sm	sm
Peregrine Falcon B		sm		m	sm	y	sm		sm	sm	sm	ps	ps	ps
Pileated Woodpecker Y	a	y			y	y	y		y	y	y	y		ps
Prairie Falcon R		m				y	sm		sw	y	s			
Pygmy Nuthatch G	a	y				y	y							
Red-breasted Nuthatch G	a	y		y	y	y	y		y	y	y	y	y	y
Red-breasted Sapsucker G	a					s						ps		
Red Crossbill G	a			Y	Y	Y	Y		Y	Y	Y	Y	y	y
Red-throated Loon B						aw	a							
Ring-billed Gull B		sm				Y	sm		swM	sm	sM	s		
Short-billed Dowitcher B		p			ps	a	m		s		s			
Spruce Grouse Y	a	y		y	y	y	y		y	y	y	y	y	y
Three-toed Woodpecker G	a	y		y	y	y	y		y	y	y	y	y	y
Townsend's Warbler G	a			sm	sm	sm	sm		sm	sm	sm	sm	sa	sa

TABLE 6.1. (Continued)

Species / Status[b]		Degree of old-growth need[c]	PP dh1	PP dh2	MS dm	MS dk	IDF xh	IDF dm1	IDF dm2	ICH dw, xw	ICH mk	ICH mw	ICH wk	ESSF dk, dc	ESSF wm, wc, vc
BIRDS															
Varied Thrush	G	a	w		sm	sm	y	y		psAW	smw	psA W	psA W	sm	sm
Vaux's Swift	B	a	PS				PSa	PSa		PSa	ps	PSa	s		
Western Bluebird	B		ms				sm			sm	sm	sm			
Western Flycatcher	G	a			sm	sm				sm	sm	sm	sm		
Western Grebe	B					m	SwM	sm		SwM	sm	sm	sm		
White-breasted Nuthatch	G	a	y				y	y		y	y	y	m		
White-headed Woodpecker	B	a					y	ps							
White-throated Swift	B		ps				ps			ps					
White-winged Crossbill	G	a			sm	sm	sm	sm		sm	sm	sm	sm	sa	sa
Williamson's Sapsucker	B	a	ps		sm		ps								
Wood Duck	Y	a	sm				w	ps		sm	ps	ps			
Yellow-breasted Chat	B									s					
Yellow-headed Blackbird	Y		PSaw		ps	ps	PSaw	PSaw		PSa	sm	PSa	ps		
TOTAL[e] AMPHIBIANS			4		4	5	8	7		6	7	6	6	3	3
TOTAL REPTILES			6		0	0	10	3		7	6	6	4	0	0
TOTAL MAMMALS			51		54	57	62	63		58	57	63	57	57	56
TOTAL BIRDS			220		154	172	281	250		262	205	234	188	114	108

See footnotes next page

TABLE 6.1. (Concluded)

a The following subzones and variants are grouped to match the level of information available for the species listed. IDFxh includes data from IDFxh, xw, and xm; IDFdm includes data from IDFdm and dk; ICHmk includes data from ICHmk and dk; ESSFdk and dc includes data from ESSFdk, dc, and dv; and ESSFwm, wc, vc includes data from ESSFwm, wc, vc, vv, wv, and wk. The IDFxw, xm, and dk, ICHdk, and ESSFdv, vv, **wv,** and wk are not found in the Nelson Forest Region.

b R=red; B=blue; Y=yellow; G=green.

c a=attribute dependent. Species requires old-growth forest attributes such as large dead trees or coarse woody debris (stand level).
d=forest dependent. Species requires intact old-growth forests (landscape level).

d Abundance is indicated by a lower or upper case letter. Common or abundant is an upper case letter. Uncommon, scarce, rare, or casual is a lower case letter. An upper case letter does not indicate abundance throughout a subzone variant, but nearly always refers to local abundance. However, if a species has a known abundance in only a small locality in a subzone or variant a lower case letter is used. Seasonality is indicated by a letter code.
P - spring (March-May); S - summer (June -August); A - autumn (September-November); W - winter (December-February); M - migratory (Spring and Autumn);
Y - yearlong. Some cases do not fit neatly into this scheme. For instance, a species which is known to be migratory, but has on occasion been seen in December in a particular subzone, would still be listed as M. All entries are based on the provincial wildlife data base prepared by Stevens (1992) for the Wildlife Interpretation Subgroup.

e Totals refer to the total number of species known to occur in each subzone.

Climate The ICH Zone has cool, wet winters and warm, moist to dry summers (Table 6). Annual precipitation is among the highest in the Region, exceeded only by that of the ESSF and associated alpine and by portions of the SBSwk1. About 40% of the annual precipitation falls during the summer months, from May through September. Peak precipitation periods are early winter and early summer.

TABLE 6 Environmental characteristics of ICH subzones and variants in the Cariboo Forest Region

	ICHdk	ICHmk3	ICHwk2	ICHwk4
Area (km^2)	425	1123	1726	607
Elevation range (m)	900–1250	780–1250	725–1250	800–1250
Climate	no data			no data
Precipitation (mm)				
Mean annual		722	842	
Mean summer		333	354	
Mean winter		389	490	
Mean annual Snowfall (cm)		214	262	
Temperature(°C)				
Mean annual		4.2	4.0	
Mean - warmest month		15.0	15.1	
Mean - coldest month		-9.3	-10.0	
Frost-free days		166	165	
Soils				
Zonal soils[a]	Br.G.L.	Br.G.L. (O.HF.P.)	O.HF.P.	O.HF.P.
Zonal humus form[b]	HR (RM)	HR (RM)	HR, RM	HR, RM

[a]Br.G.L. = Brunisolic Gray Luvisol; O.HF.P. = Orthic Humo-Ferric Podzol
[b]HR = HemiMor; RM = MorModer
Note: ICHmw3 not included due to very small area (32 km^2) in Cariboo Forest Region.

Snowfall accounts for about 30–35% of the annual precipitation and results in maximum snowpacks of about 1.5 m on plateau areas and 1.5–2.0 m at upper elevations of the zone in the Quesnel Highland. Mean annual temperatures are among the warmest in the Cariboo Forest Region and are exceeded only by those of the Bunchgrass Zone, portions of the Interior Douglas-fir Zone, and warmest subzones of the Sub-Boreal Spruce Zone. Growing-season frosts are less common in the ICH than in the SBS or IDF zones due to higher humidity and cloud cover, resulting in reduced overnight radiation cooling.

elevations it borders the ICHmk3 and the ESSFwk1. The ICHdk also has a very small area in the adjacent Kamloops Forest Region, just north of Mahood Lake.

The ICHdk is the driest ICH subzone in the Cariboo Forest Region and one of the driest in British Columbia. Although no climate data are available for this subzone, vegetation and soils suggest that precipitation amounts are only slightly greater than, and temperatures similar to, those of the SBSdw1.

Vegetation of the ICHdk is transitional between the SBSdw1 and the ICHmk3 and distinguished from other ICH subzones by relatively dry-climate shrubs such as saskatoon and soopolallie and the prevalence of lodgepole pine forests (Table 7). Climax tree species on zonal sites are western redcedar and subalpine fir, but, due to frequent wildfires, climax forests are uncommon. Douglas-fir and lodgepole pine forests cover most of the landscape. These forests often include scattered western redcedar, subalpine fir, and hybrid white spruce trees in the canopy and abundant redcedar and subalpine fir in the understory. Trembling aspen is also common. Western hemlock is uncommon.

Mature forests on zonal sites typically have a floristically rich and well-developed shrub and herbaceous undergrowth. Common shrubs include falsebox, black huckleberry, thimbleberry, saskatoon, and red-osier dogwood. The herbaceous layer is nearly continuous and includes wild sarsaparilla, twinflower, bunchberry, prince's pine, trailing raspberry, and clasping twistedstalk. Moss cover is also well developed but often obscured by herbaceous vegetation. Principal species are red-stemmed feathermoss and knight's plume.

ICHmk3 Variant The ICHmk3 in the Cariboo Forest Region occurs primarily on the Fraser Plateau, west of Quesnel Lake and along the western third of Horsefly Lake. A smaller portion of the variant occurs in the western Quesnel Highland in the McKinley Creek drainage, including McKinley, Elbow, and Gotchen lakes, and in the Hendrix Creek and Deception Creek valleys. An outlier of the ICHmk3 occurs near Spectacle Lake in Bowron Provincial Park. The variant occurs primarily on gently rolling plateau topography, except in the Hendrix and Deception creek valleys and near Spectacle Lake, where it occupies valley bottoms between low mountains. The ICHmk3 is primarily a transition between the SBSdw1 on plateau landscapes and the wetter ICHwk2 of the more rugged Quesnel Highland.

TABLE 7 ICH vegetation table - zonal sites[a]

	Biogeoclimatic Unit	ICH dk	ICH mk3	ICH wk2	ICH wk4	
Tree	*Pseudotsuga menziesii*	▮▮▮▮▮	▮▮▮▮▮			Douglas-fir
Layer	*Abies lasiocarpa*	▮	▮▮▮▮		▮▮▮	subalpine fir
	Picea engelmannii x *glauca*	▮▮▮▮	▮▮▮▮		▮▮▮▮	hybrid white spruce
	Thuja plicata	▮	▮▮▮▮▮	▮▮▮▮▮	▮▮▮▮	western redcedar
	Tsuga heterophylla			▮▮▮▮▮	▮▮▮▮▮	western hemlock
Shrub	*Amelanchier alnifolia*	▮▮				saskatoon
Layer	*Lonicera involucrata*	▮▮				black twinberry
	Pachistima myrsinites	▮▮▮▮▮	▮▮▮			falsebox
	Ribes lacustre	▮▮	▮		▮	black gooseberry
	Vaccinium membranaceum	▮▮▮	▮▮▮▮	▮▮▮	▮▮▮	black huckleberry
	Oplopanax horridus	▮	▮	▮▮▮	▮	devil's club
	Vaccinium ovalifolium			▮▮▮	▮▮▮	oval-leaved blueberry
Herb	*Osmorhiza chilensis*	▮▮				mountain sweet-cicely
Layer	*Aralia nudicaulis*	▮▮▮	▮▮▮			wild sarsaparilla
	Pyrola chlorantha	▮▮	▮▮▮			green wintergreen
	Mitella nuda		▮▮			common mitrewort
	Linnaea borealis	▮▮▮	▮▮▮	▮		twinflower
	Goodyera oblongifolia	▮▮	▮▮▮	▮▮▮		rattlesnake-plantain
	Clintonia uniflora	▮▮▮	▮▮▮	▮▮▮▮	▮▮▮	queen's cup
	Orthilia secunda	▮▮	▮▮▮	▮▮▮	▮▮▮	one-sided wintergreen
	Streptopus roseus	▮▮	▮	▮▮▮	▮▮▮	rosy twistedstalk
	Cornus canadensis	▮▮▮	▮▮▮	▮▮▮▮	▮▮▮▮	bunchberry
	Tiarella unifoliata	▮	▮▮▮	▮▮▮		one-leaved foamflower
	Gymnocarpium dryopteris		▮	▮▮▮▮	▮▮▮▮	oak fern
	Dryopteris expansa			▮▮▮		spiny wood fern
	Listera cordata		▮▮	▮▮	▮	heart-leaved twayblade
	Tiarella trifoliata	▮	▮▮	▮▮▮	▮▮▮	three-leaved foamflower
	Rubus pedatus	▮	▮▮▮	▮▮▮	▮▮▮▮	five-leaved bramble
Moss	*Rhytidiadelphus triquetrus*	▮▮▮	▮▮▮▮	▮	▮▮▮	electrified cat's-tail moss
Layer	*Brachythecium* spp.	▮▮▮	▮▮▮	▮▮▮		ragged mosses
	Mnium spp.	▮	▮▮▮	▮▮▮		leafy mosses
	Ptilium crista-castrensis	▮▮▮▮▮	▮▮▮▮▮	▮▮▮▮	▮▮▮▮	knight's plume
	Pleurozium schreberi	▮▮▮▮▮	▮▮▮▮▮	▮▮▮▮▮	▮▮▮▮	red-stemmed feathermoss
	Hylocomium splendens	▮▮▮	▮▮▮▮	▮▮▮▮▮	▮▮▮▮▮	step moss
	Dicranum spp.	▮▮▮	▮▮▮	▮▮▮		heron's bill mosses
	Barbilophozia spp.		▮▮▮	▮		leafy liverworts
	Rhytidiopsis robusta			▮▮▮▮		pipecleaner moss

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

Note: ICHmw3 not included due to no data from Cariboo Forest Region.

The ICHmk3 climate is wetter than that of the ICHdk but significantly drier than most portions of the ICHwk. Mean annual precipitation (722 mm) is greater than that of the Sub-Boreal Spruce Zone in the Cariboo Forest Region, with the exception of the SBSwk1. About 45% of the annual precipitation falls during the summer months from May through September and about 30% falls as snow. Greatest rainfall months are June, July, and August and the greatest snowfall months are December through February. Peak snowpack is about 1.5 m. Mean annual temperatures in the ICHmk are similar to those of other ICH subzones in the Region and slightly warmer than those of SBS subzones in the Region.

The natural landscape of the ICHmk3 is blanketed by young, mature, and old forests of western redcedar, Douglas-fir, and lodgepole pine. Hybrid white spruce forests are common on moist valley bottom sites. Trembling aspen and paper birch forests occupy many recently burned sites. Due to past wildfires, young coniferous forests cover much of the landscape. On most sites, the young forests are dominated by Douglas-fir and/or lodgepole pine, with a dense understory of western redcedar and subalpine fir. The proportion of redcedar, subalpine fir, and spruce in the canopy generally increases as the stand ages, and old stands are typically dominated by western redcedar with scattered subalpine fir and spruce and an occasional Douglas-fir veteran. Western hemlock occurs infrequently in the understory. The undergrowth vegetation of mature forests on zonal sites includes a moderate cover of black huckleberry, falsebox, several low-growing herbs, and a nearly continuous cover of feathermosses.

ICHmw3 Variant The ICHmw3 has an extremely small area (32 km^2) within the Cariboo Forest Region, north of Mahood Lake. This variant occurs primarily in the Kamloops Forest Region. The Kamloops Forest Region guide to ecosystems (Lloyd *et al*. 1990) should be consulted for a description of this subzone and its site series.

ICHwk Subzone The ICHwk is the largest ICH subzone (2333 km^2) in the Cariboo Forest Region. It occurs in the mountainous topography of the Quesnel Highland, as far north as the Cariboo River valley and from valley bottoms to approximately 1250 m. Lowest elevations are lower than most areas of the Fraser Plateau. The largest area of the subzone is centred on Quesnel and upper Horsefly lakes but it also occurs in valleys of the Cariboo, Matthew, and Mitchell rivers and the McKusky,

ICHmk3
INTERIOR CEDAR–HEMLOCK
MOIST COOL SUBZONE
HORSEFLY VARIANT

The ICHmk3 occurs on the gently rolling terrain along the eastern flank of the Fraser Plateau and adjacent portions of the Quesnel Highland from Quesnel Lake in the north to McNeil Lake in the south. A small, northern outlier of the ICHmk3 occurs at the southwest corner of Bowron Lake Park, near Spectacle Lake. A second outlier occurs immediately south of the west end of Canim Lake. The ICHmk3 occurs at elevations between 780 and 1250 m.

Distinguishing Adjacent Units from the ICHmk3

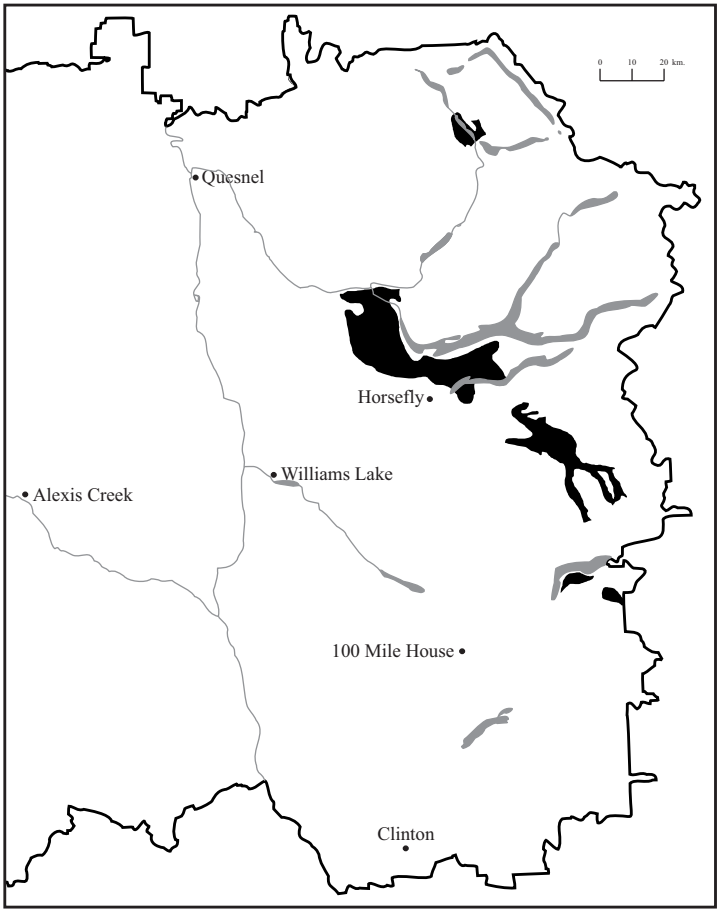
The **SBSdw1** occurs to the west in drier climates of the Fraser Plateau. The **SBSmw** replaces the ICHmk3 north of the Quesnel River where the climate is cooler. The **ICHwk2** occurs in the wetter and milder climate east of the ICHmk3, primarily in valleys of the higher-relief terrain of the Quesnel Highland. The **ESSFwk1** occurs above the ICHmk3 in the colder, snowier climates above 1250 m. The **ICHdk** replaces the ICHmk3 south of Big Timothy Mountain where the climate is drier. The northern outlier of the ICHmk3 is bounded by the **SBSwk1** and the **ICHwk4.** The southern outlier is adjacent to the warmer, drier **IDFmw** at lower elevations.

In the **ICHdk**, zonal sites have:
- more abundant and vigorous growth of shrubs and herbaceous plants;
- common lodgepole pine, thimbleberry, and saskatoon;
- very little redcedar in the codominant layer;
- less conspicuous moss layer.

In the **ICHwk2**, zonal sites have:
- western hemlock;
- pipecleaner moss;
- uncommon subalpine fir in overstory of mature stands;
- much less dense understory of redcedar in mature stands;
- common oval-leaved blueberry.

In the **ICHwk4**, zonal sites have:
- western hemlock;
- pipecleaner moss;

Distribution of ICHmk3 Variant in the Cariboo Forest Region



• much less dense understory of redcedar in mature stands;
• common oval-leaved blueberry.

In the **SBSdw1**, zonal sites have:
• pinegrass;
• frequent lodgepole pine stands;
• no redcedar, five-leaved bramble, rosy twistedstalk, or foamflower;
• little or no subalpine fir in canopy of mature stands.

In the **SBSmw**, zonal sites have:
• western mountain-ash, showy aster, and trailing raspberry;
• no redcedar or five-leaved bramble.

In the **SBSwk1**, zonal sites have:
• common oak fern;
• no redcedar, Douglas-fir, or prince's pine;
• uncommon falsebox.

In the **ESSFwk1**, zonal sites have:
• white-flowered rhododendron, Sitka valerian, and Indian hellebore;
• no redcedar, Douglas-fir, or wild sarsaparilla.

Site Units of the ICHmk3

Zonal Site Series **01 CwSx - Falsebox - Knight's plume Site Series** dominates the ICHmk3 landscape. It occurs on gentle to moderately sloping terrain with deep, medium-textured soils. Late seral and climax stands have closed canopies dominated by western redcedar and subalpine fir. Hybrid white spruce is frequently scattered throughout the stand. Western hemlock rarely occurs in the overstory and only occasionally occurs in the understory. A very dense cover of redcedar and subalpine fir regeneration is a characteristic. Seral stands are frequently dominated by Douglas-fir and lodgepole pine. Paper birch is frequently present in seral stands and occasionally forms nearly pure stands. The undergrowth, except for the dense regeneration layer, contains a moderate to sparse cover of falsebox and black huckleberry as well as several forbs including wild sarsaparilla, foamflower, queen's cup, bunchberry, twinflower, and five-leaved bramble. Ferns are generally lacking. The moss layer usually forms a nearly continuous carpet dominated by red-stemmed feathermoss, step moss, and knight's plume.

Drier Sites Sites drier than zonal are relatively common but small. They occur primarily on crests and steep upper slopes on the numerous hills that occur in the variant. Compared to zonal sites, dry-site forests have a more open canopy, relatively sparse tree regeneration, several dry-site species, and a less continuous cover of mosses.

02 FdCw - Wavy-leaved moss Site Series occurs on hill crests with thin gravelly soils over bedrock. Bedrock is frequently exposed. These are very dry sites with open forest canopies dominated by Douglas-fir and lodgepole pine. Tree regeneration is sparse and consists of scattered, poorly growing redcedar, subalpine fir, Douglas-fir, and lodgepole pine. The undergrowth contains several dry-site species including common juniper, soopolallie, prickly rose, pussy-toes, white-flowered hawkweed, western fescue, and rough-leaved ricegrass. Red-stemmed feathermoss and wavy-leaved moss are abundant. Abundant lichens distinguish this site series from the /03.

03 CwSxw - Soopolallie Site Series occurs on steep south- or west-facing mid to upper slopes with deep soils. The forest canopy is dominated by Douglas-fir or less frequently by lodgepole pine. In addition, redcedar, subalpine fir, and hybrid white spruce frequently occur in the lower canopy. Regeneration, often dense, is dominated by redcedar and subalpine fir. The undergrowth vegetation has a small to moderate cover characterized by scattered birch-leaved spirea, saskatoon, falsebox, prince's pine, showy aster, western fescue, and rough-leaved ricegrass. The moss layer is well developed but less continuous than that of zonal sites.

Wetter Sites Forested sites that are wetter than zonal sites are common on lower slopes, in valley bottoms, and in small depressions. The presence of ferns, thimbleberry, devil's club, sweet-scented bedstraw, and mountain sweet-cicely, and the abundance of leafy mosses, distinguishes these sites from zonal and drier sites.

04 CwSxw - Oak fern - Cat's-tail moss Site Series occurs on sites that are slightly more moist (mesic–subhygric) than zonal sites. They occur primarily on mid and lower slope positions where they receive low volumes of intermittent seepage. Soils are frequently mottled and forest floors are relatively thick (7–12 cm). The forest canopy is moderately closed and dominated by redcedar, with subalpine fir and hybrid white spruce in the lower canopy. Regeneration is dominated

by redcedar and is often moderately dense. In addition to species common on zonal sites, characteristic species on these sites include devil's club, oak fern, rosy twistedstalk, and sweet-scented bedstraw. The moss layer is typically well developed and dominated by electrified cat's-tail moss, woodsy ragged moss, and leafy mosses.

05 SxwCw - Oak fern Site Series includes moist sites on mid and lower slopes that receive intermittent, low-volume seepage during the growing season. In contrast to the /04, they are usually cold air accumulation sites associated with streams. The forest canopy is dominated by subalpine fir, hybrid white spruce, and western redcedar. Tree regeneration is typically dense and dominated by subalpine fir, hybrid white spruce, and redcedar. The typically dense undergrowth vegetation includes thimbleberry, black twinberry, red osier dogwood, fringed aster, Columbia brome, trailing raspberry, and creamy peavine. Unlike the /04 site series, devil's club and ferns are typically lacking or occur only with low cover in this site series. The moss layer is dominated by feathermosses, electrified cat's-tail moss, woodsy ragged moss, and leafy mosses.

06 CwHw - Devil's club - Lady fern Site Series occurs on lower and toe slope sites that receive seepage throughout most of the growing season. They are often associated with stream channels. The forest canopy varies from open to moderately closed and is dominated by hybrid white spruce, subalpine fir, and western redcedar. Tree regeneration is sparse to moderately dense and consists of the same species that dominate the canopy. Abundant devil's club and ferns (especially lady fern and oak fern) distinguish these sites from other wet sites in the ICHmk3. The moss layer is often patchy.

07 CwSxw - Devil's club - Horsetail Site Series includes the wettest forested sites in the ICHmk3. They occur on toe slope positions and in depressions with a water table at or near the soil surface throughout the growing season. They are often associated with stream channels. The soil surface is usually mounded, and standing water is frequently present between the mounds. Soils are either organic or strongly gleyed. The forest canopy is open to moderately closed and dominated by hybrid white spruce, western redcedar, and subalpine fir. Tree regeneration is primarily redcedar and subalpine fir. The undergrowth is characterized by devil's club, black gooseberry, black twinberry, ferns, common horsetail, and clasping twistedstalk. The moss layer is dominated by leafy mosses.

Non-forested Sites Non-forested wetlands are generally uncommon and small. Fens occur in some closed depressions where the soils remain very wet throughout the year. Vegetation of these sites usually contains scrub birch, Labrador tea, willows, sedges, brown mosses, and sphagnum moss. Grasslands are not present in the ICHmk3, and the natural upland landscapes are entirely forested with the exception of rock cliffs, talus slopes, and similar features.

Key to Site Units of the ICHmk3

1a. Soils shallow (<50 cm); bedrock frequently exposed; crest slope position; lichens abundant.

ICHmk3/02 FdCw - Wavy-leaved moss

1b. Soils deeper (>50 cm); bedrock seldom exposed; not crest slope position; lichens not abundant.

2a. Slope steep (>50 %); parent material usually colluvial; upper slope position.

3a. Aspect SE, S, SW, or W; canopy of mature forest open; rough-leaved ricegrass and dog lichen usually present; common mitrewort, three-leaved foamflower, five-leaved bramble, and woodsy ragged moss absent or incidental.

ICHmk3/03 CwSxw - Soopolallie

3b. Aspect NW, N, NE, or E; mature canopy closed; common mitrewort, three-leaved foamflower, five-leaved bramble, and woodsy ragged moss present; rough-leaved ricegrass and dog lichen absent.

ICHmk3/01 CwSxw - Falsebox - Knight's plume

2b. Slope gentler (<50%); slope position variable; parent material usually not colluvium.

4a. Moisture regime submesic or mesic; moss layer nearly continuous and "carpet-like"; prince's pine present; oak fern cover <10%; black twinberry, red-osier dogwood, spiny wood fern, and horsetails absent; slope position upper or mid.

ICHmk3/01 CwSxw - Falsebox - Knight's plume

4b. Moisture regime subhygric (occasionally mesic) or wetter; moss layer not "carpet-like"; prince's pine absent; oak fern cover >10% **or** black twinberry, red-osier dogwood, spiny wood fern, or horsetails present; slope position mostly lower or toe.

5a. Free water not present within 50 cm of surface except possibly for short periods early in the growing season; soft-leaved sedge absent.

6a. Canopy of mature stands dominated by western redcedar; shrub layer (excluding tree regeneration) relatively sparse (<10 % cover); cover of devil's club <5%; black twinberry and red-osier dogwood absent or incidental.

ICHmk3/04 CwSxw - Oak fern - Cat's-tail moss

6b. Canopy of mature stands dominated by hybrid white spruce and/or subalpine fir (western redcedar often present); shrub layer of mature stands usually dense; cover of devil's club >5% **or** black twinberry and red-osier dogwood present.

7a. Canopy of mature stands dominated by western redcedar; devil's club abundant (cover >20% **and** greater than the combined cover of black twinberry and thimbleberry); ferns abundant (combined cover >15%).

ICHmk3/06 CwHw - Devil's club - Lady fern

7b. Canopy of mature stands not dominated by western redcedar; devil's club not abundant (<1% cover and less than the combined cover of black twinberry and thimbleberry); ferns not abundant (combined cover <15%); usually cold air accumulation sites.

ICHmk3/05 SxwCw - Oak fern

5b. Free water present within 50 cm of soil surface for entire growing season; soft-leaved sedge present.

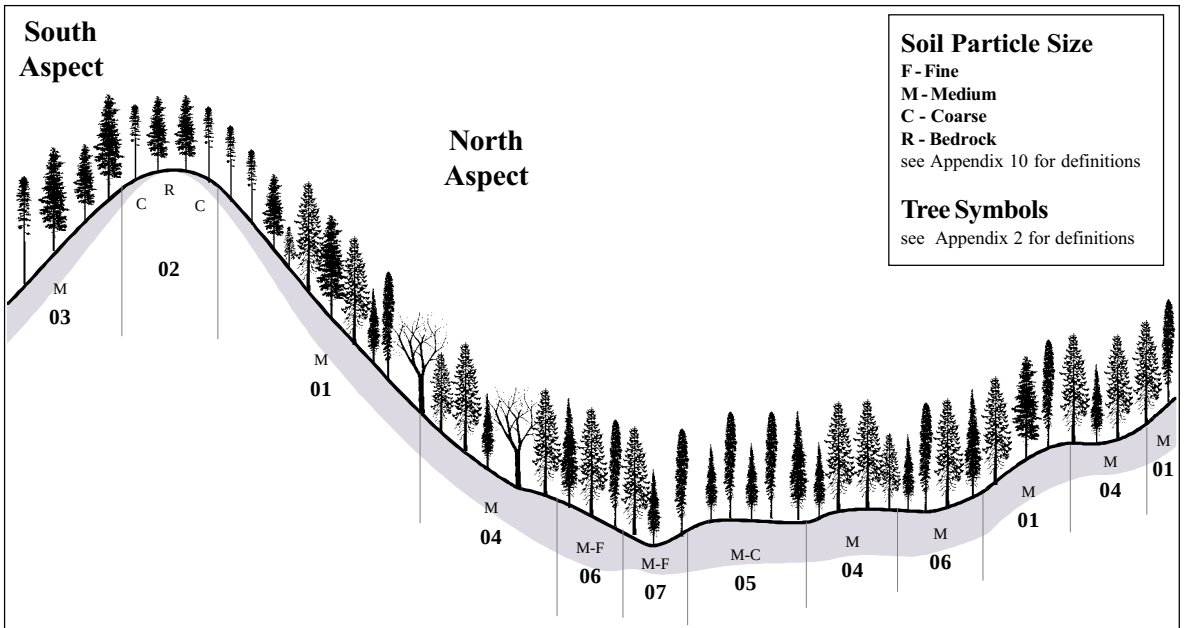
ICHmk3/07 CwSxw - Devil's club - Horsetail

ICHmk3 Edatopic Grid

Site Series

01 CwSxw - Falsebox - Knight's plume
02 FdCw - Wavy-leaved moss
03 CwSxw - Soopolallie
04 CwSxw - Oak fern - Cat's-tail moss
05 SxwCw - Oak fern
06 CwHw - Devil's club - Lady fern
07 CwSxw - Devil's club - Horsetail

ICHmk3 Landscape Profile



Site Features of ICHmk3 Site Series

Site Series	/01	/02	/03	/04
Key Features	zonal and other gently to moderately sloping sites with mesic/near mesic moisture regime; also some steep E- or N-facing slopes.	hill and ridge crests with shallow (< 50 cm) soils over bedrock.	upper slope positions on steep (> 50%) S- or W-facing slopes; loamy soils.	moist mid and lower slope positions with low volumes of intermittent seepage water; not cold air accumulation sites.
Soil Moisture/ Nutrient Regimes	submesic, mesic / poor - rich	xeric, subxeric / poor - rich	submesic (subxeric) / poor - rich	mesic, subhygric / medium, rich
Slope Position	middle (upper)	crest	upper	middle, lower
Aspect	all	all	SE, S, SW, W	all
Slope Grade (%)	0 - 30 (60)	< 10	> 50	10 - 20 (35)
Soil Texture	gravelly loamy	gravelly loamy	gravelly loamy	loamy
Humus Form and Thickness (cm)	Hemimor (Humimor) 3 - 8	Xeromor, Hemimor 2 - 5	Hemimor, Hemihumimor 2 - 5	Hemimor (Humimor) 4 - 12
Occurrence / Size / Distribution	predominant / moderate / wide	common / small - moderate / wide	common / small - moderate / wide	common / moderate / wide

Site Features of ICHmk3 Site Series (continued)

Site Series	/05	/06	/07
Key Features	moist lower and toe slope sites with intermittent seepage and cold air accumulation; usually in valley bottoms.	very moist lower and toe slope sites with persistent seepage; not cold air accumulation sites.	wet toe slope positions and depressions with near-surface (< 50 cm) water table.
Soil Moisture/ Nutrient Regimes	subhygric (mesic) / poor - rich	subhygric (hygric) / rich, very rich	hygric / poor - rich
Slope Position	middle, lower, level	lower, toe (middle)	toe, depression
Aspect	all	all	none
Slope Grade (%)	5 - 40	0 - 10 (25)	< 5
Soil Texture	variable	loamy, silty	variable
Humus Form and Thickness (cm)	Humimor (Hemimor) 3 - 8	Humimor, Hydromoder 6 - 25	Hydromoder, Hydromor 21 - 80
Occurrence / Size/ Distribution	common / moderate / wide	common / small - moderate / wide	uncommon / small / wide

ICHmk3 Vegetation Table[a]

	Site Unit	02	03	01	04	05	06	07	
Tree Layer	*Pinus contorta*	▮▮▮							lodgepole pine
	Picea engelmannii x *glauca*	▮▮▮	▮▮▮	▮▮▮▮	▮▮	▮▮▮▮▮	▮▮▮▮▮	▮▮▮▮▮	hybrid white spruce
	Pseudotsuga menziesii	▮▮▮▮▮	▮▮▮▮▮	▮▮▮▮▮	▮				Douglas-fir
	Thuja plicata		▮▮▮▮	▮▮▮▮▮	▮▮▮▮▮	▮▮▮▮	▮▮▮▮▮	▮▮▮▮▮	western redcedar
	Abies lasiocarpa		▮▮▮	▮▮▮▮	▮	▮▮▮▮▮	▮▮▮▮	▮▮▮▮	subalpine fir
Shrub Layer	*Juniperus communis*	▮▮▮							common juniper
	Acer glabrum	▮▮▮	▮						Douglas maple
	Mahonia aquifolium	▮▮▮	▮			▮			tall Oregon-grape
	Shepherdia canadensis	▮▮▮	▮				▮▮▮▮▮		soopolallie
	Pachistima myrsinites	▮▮▮	▮▮▮	▮▮▮	▮▮▮	▮▮▮	▮▮▮		falsebox
	Oplopanax horridus			▮	▮▮▮	▮▮▮	▮▮▮	▮▮▮▮	devil's club
	Rubus parviflorus		▮		▮▮	▮▮▮▮	▮▮▮		thimbleberry
	Cornus stolonifera					▮▮▮		▮▮▮	red-osier dogwood
	Lonicera involucrata					▮▮▮		▮▮▮	black twinberry
Herb Layer	*Festuca occidentalis*	▮▮▮	▮▮						western fescue
	Oryzopsis asperifolia	▮▮▮	▮▮▮						rough-leaved ricegrass
	Aster conspicuus	▮▮▮	▮						showy aster
	Chimaphila umbellata	▮▮▮	▮▮▮▮	▮▮▮			▮▮▮▮		prince's pine
	Aralia nudicaulis	▮▮	▮	▮▮▮	▮▮▮	▮▮▮	▮▮		wild sarsaparilla
	Cornus canadensis		▮	▮▮▮	▮▮▮	▮▮▮▮	▮▮▮	▮▮▮	bunchberry
	Mitella nuda			▮▮	▮▮	▮▮▮		▮▮▮	common mitrewort
	Tiarella trifoliata		▮	▮▮▮	▮▮▮	▮▮▮	▮▮▮	▮▮▮	foamflower
	Viola orbiculata			▮▮	▮▮	▮	▮▮▮		round-leaved violet
	Galium triflorum				▮▮	▮▮	▮▮▮	▮▮▮	sweet-scented bedstraw
	Streptopus roseus			▮	▮▮▮	▮▮▮	▮▮▮▮▮	▮	rosy twistedstalk
	Dryopteris expansa				▮▮		▮▮▮	▮▮▮	spiny wood fern
	Gymnocarpium dryopteris		▮	▮	▮▮▮▮▮	▮	▮▮▮▮	▮▮▮▮	oak fern
	Streptopus amplexifolius				▮	▮▮	▮▮	▮▮▮	clasping twistedstalk
	Athyrium filix-femina				▮	▮	▮▮	▮▮▮▮	lady fern
	Rubus pubescens					▮▮▮	▮▮▮		trailing raspberry
	Cinna latifolia							▮	nodding wood-reed
	Circaea alpina							▮▮▮	enchanter's nightshade
	Equisetum arvense							▮▮▮▮	common horsetail
Moss Layer	*Cladonia / Cladina* spp.	▮▮▮							cladonia lichens / reindeer lichens
	Peltigera aphthosa	▮▮▮	▮▮▮	▮			▮▮▮▮		freckle pelt
	Dicranum polysetum	▮▮▮▮	▮▮▮▮				▮▮▮		wavy-leaved moss
	Pleurozium schreberi	▮▮▮▮▮	▮▮▮▮▮	▮▮▮▮▮	▮▮▮	▮▮▮▮▮	▮▮▮	▮▮▮	red-stemmed feathermoss
	Rhytidiadelphus triquetrus	▮▮▮	▮▮▮	▮▮▮▮	▮▮▮▮▮	▮▮▮▮▮	▮▮▮▮	▮▮▮▮▮	electrified cat's-tail moss
	Hylocomium splendens	▮▮▮	▮▮▮▮	▮▮▮▮	▮	▮▮▮		▮	step moss
	Plagiomnium medium				▮	▮▮▮		▮▮▮	common leafy moss

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

ICHmk3 Silviculture Considerations

Silviculture Practices and Options

Predominant silviculture systems are currently even-aged (clearcutting) management. Following harvesting, sites are usually broadcast burned to reduce slash and vegetation competition, improve planter access, and reduce forest floor layers for planting. Nearly all harvested sites are planted, usually with Douglas-fir and/or lodgepole pine on mesic and drier sites and with spruce on wetter sites. Wetter sites are often mounded to create warmer, better-drained soils for initial seedling establishment.

Partial harvesting experience in the ICHmk3 is essentially nonexistent.

Advance regeneration is primarily Cw and Bl, which are often very dense. Bl stems <25 cm tall usually have good form and vigour, but taller stems are often old and have incipient decay. Cw often originates by layering and typically has incipient decay from the parent tree.

Natural restocking has not been widely used operationally as a regeneration method. Fd, Sxw, Bl, and Cw, as well as Act and At natural regeneration ingress, generally occupy exposed mineral soil in cleared openings if vegetation is not dense and seed is abundant.

Principal Insect and Disease Concerns

Cw has a high risk of heart rot on all sites.
Most Bl stems in the canopy of old stands have extensive heart rot, but some data indicate that younger second-growth stands may have much less heart rot.
White pine weevil is a major concern, causing extensive terminal dieback on vigorous, open-grown Sxw on some sites.
Armillaria root rot affects isolated trees and large infection centres, often killing all conifer trees. Partial harvest will increase armillaria damage.
Tomentosus and laminated root disease are also prevalent.
Warren's root collar weevil can cause moderate damage in some plantations, especially with deep, moist forest floor.
Black army cutworm can cause extensive mortality in some plantations on recently burned sites.
Spruce beetle can cause high mortality locally, especially on sites with windthrow or poor logging.

Sxw and Bl may experience severe defoliation from two-year-cycle budworm in high-population years.
Bl has moderate to high risk of attack from balsam bark beetle.
Western spruce budworm has locally caused severe defoliation of Fd.

Silviculture Considerations Table — Harvest Assumptions

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

Canopy present refers primarily to group selection systems with smaller (generally 30–60 m wide) patches. On warm, dry sites (site series /03) and very wet sites (site series /07), it refers to low- to moderate-volume removal single tree selection systems.

ICHmk3 Site Series - Silviculture Considerations

Site series	Ecologically adapted tree species	Principal site factors limiting tree establishment and early growth		Vegetation potential and complex
		No or limited canopy	Canopy present	
01	P:Fd	***light deficits (vegetation overtop)***		most common: medium; Mixed shrub - dry shrub
	Pl	**Fd**, **Pl**, Sxw,	**Fd**, **Pl**, Sxw,	less common (No or limited canopy): medium; Mixed
	Sxw	**Act**, **At**, **Ep**	**Act**, **At**, **Ep**	hardwood - dry shrub
	S:Bl	***summer frost (gentle slopes)***		•Ep and Act commonly seed in on exposed mineral soils and
	T:Cw	Fd, Cw	----	may dominate site for several years;
	D:Act, At, Ep	***moisture deficits (submesic sites)***		•advance Bl regeneration may limit success of planted stock.

•survival and growth of planted **Fd**, **Pl**, **Sxw**, and **Bl** generally adequate to restock cleared or partial-cut sites if vegetation and dense advance regeneration controlled at planting spot and (for **Pl** and **Fd** in partial cuts) if planted in sunny / lightly shaded microsites;

•moderate-intensity broadcast burn will usually reduce above-ground competing vegetation for 3–5 years;

•most advance **Cw** regeneration originates by layering and has incipient heart rot from parent tree;

•advance **Bl** regeneration >25 cm tall frequently has poor form, branch damage, and incipient decay;

•post-harvest natural regeneration ingress of **Fd**, **Sxw**, **Bl**, and **Cw** anticipated in small openings and near mature forest edge where mineral soil is exposed; small **Cw** established naturally from seed usually free of heart rot but probability of forming a sound crop tree is uncertain;

•dense stands of mixed hardwoods often result from extensive mineral soil exposure where there are adjacent seed sources.

ICHmk3 Site Series - Silviculture Considerations (continued)

Site series	Ecologically adapted tree species	Principal site factors limiting tree establishment and early growth: No or limited canopy	Principal site factors limiting tree establishment and early growth: Canopy present	Vegetation potential and complex
02	P:Fd	***moisture deficit***s		low; Dry shrub - falsebox
	Pl	**Sxw**, Bl	Sxw, Bl	
	T:Bl	***light deficits***		•shrub and herb vegetation increase following canopy removal is slow and generally small.
	Sxw	----	Fd, **Pl**	
	D:At	***nutrient deficits***		
	•sites have low productivity for timber and significant challenges for reforestation; survival of planted **Pl** and **Fd** may be adequate to restock sites if planted in microsites with deeper soil; vegetation control usually not required; •**Pl** natural regeneration should be adequate to restock sites if sufficient cones present and well distributed; •**Fd** natural regeneration establishment common under partial **Fd** canopy but not on large cleared areas; •maintenance of soil organic layers and woody debris important for long-term nutrient availability and natural regeneration; •risk of site degradation due to site preparation (including broadcast burning) is high.			
03	P:Fd	***moisture deficits***		low; Dry shrub - falsebox
	Pl	Fd	Fd	
	D:At	***high surface temperatures (recently burned sites)***		•vegetation increase following logging generally slow and small.
	•most reliable regeneration option for **Fd** is release of advance regeneration and ingress of natural regeneration under partial canopy of mature **Fd**; •**Pl** natural regeneration ingress likely slow but probably adequate to restock sites if sufficient cones present and well distributed; •survival and early growth of planted **Fd** expected to be poor due to moisture stress and high soil surface temperatures; •planted **Pl** survival and growth usually adequate to restock sites without vegetation control; •maintenance of soil organic layers important for long-term nutrient availability and natural regeneration.			

ICHmk3 Site Series - Silviculture Considerations (continued)

Site series	Ecologically adapted tree species	Principal site factors limiting tree establishment and early growth		Vegetation potential and complex
		No or limited canopy	Canopy present	
04	P:Fd	***light deficits (vegetation overtop)***		most common: medium; Mixed shrub - moist forb
	Sxw	**Fd**, **Pl**, **Act**,	**Fd**, **Pl**, **Act**,	less common (No or limited canopy): high; Mixed hardwood -
	S:Bl	**At**, **Ep**	**At**, **Ep**	dry shrub;
	Cw	***summer frost***		
	Pl	**Fd**, **Cw**	Fd, Cw	•Ep and Act commonly seed in on exposed mineral soil from
	D:Act, At, Ep			adjacent stands and may dominate the site for many years.
	•survival and growth of planted **Fd**, **Sxw**, **Bl**, and **Pl** generally adequate to restock cleared and partial-cut sites if vegetation controlled at planting spot and (for **Fd** and **Pl** in partial cuts) if planted in sunny / lightly shaded microsites;			
	•moderate-intensity broadcast burn or mounding will usually reduce above-ground competing vegetation for 2–3 years;			
	•**Fd** and **Cw** have high risk of frost damage on lower slopes and other sites with poor air drainage; risk of frost damage is likely reduced by maintaining a partial tree canopy;			
	•most advance **Bl** >25 cm tall and nearly all advance **Cw** regeneration has poor form, branch damage, and incipient decay;			
	•advance **Sxw** regeneration generally of good form and vigour;			
	•soils moist throughout most of the growing season; risk of soil rutting and compaction generally high except when frozen.			
05	P:Sxw	***light deficits (vegetation overtop)***		high; Mixed shrub - moist shrub
	S:Bl	**Sxw**, **Pl**, **Act**	**Sxw**, **Pl**, **Act**	
	Cw	***summer frost***		•shrub and herbaceous cover may increase significantly
	Pl	**Sxw**, **Bl**, **Cw**	**Sxw**, **Bl**, **Cw**	following canopy removal.
	D:Act	***cold, moist soils***		
		Sxw, Bl, Cw, Pl	Sxw, Bl, Cw, Pl	
	•very frost-prone sites; damage to **Sxw** and **Bl** may be reduced by planting on raised microsites / exposed mineral soil;			
	•raised microsites should improve rooting zone soil temperature and growth of **all species** (planted and natural);			
	•most advance **Bl** regeneration >25 cm tall and nearly all advance **Cw** has poor form, branch damage, and incipient decay.			

ICHmk3 Site Series - Silviculture Considerations (continued)

Site series	Ecologically adapted tree species	Principal site factors limiting tree establishment and early growth		Vegetation potential and complex
		No or limited canopy	Canopy present	
06	P:Fd	***light deficits (vegetation overtop)***		most common: high; Mixed shrub - tall fern
	Sxw	**all species**	**all species**	less common (No or limited canopy): high; Mixed hardwood - moist shrub
	S:Bl	***summer frost (toe slopes)***		
	Cw	**Fd**, Sxw, **Cw**	**Fd**, **Cw**	
	Pl	***snowpress***		•abundant devil's club present prior to canopy removal is generally replaced by a dense cover of other shrubs and forbs including tall ferns following canopy removal.
	D:Act	**all species**	**all species**	
	Ep	***cold, wet soils (toe slopes)***		
		Fd, Pl	Fd, Pl	

•these are very productive sites for growth of trees, shrubs, and other vegetation;
•restocking of cleared or partial-cut sites with trees (**all species**) requires control of vigorous competing vegetation;
•moderate-intensity broadcast burn or mounding will usually reduce above-ground competing vegetation for 2–3 years;
•growth of all tree species improved by planting on raised microsites due to increased soil temperatures and soil drainage;
•management for **Fd** and **Cw** on gently sloping sites at the base of slopes will require measures to reduce frost damage;
•wet soils result in high risk of soil compaction and rutting.

ICHmk3 Site Series - Silviculture Considerations (continued)

Site series	Ecologically adapted tree species	Principal site factors limiting tree establishment and early growth		Vegetation potential and complex
		No or limited canopy	Canopy present	
07	P:Sxw	***summer frost***		most common: medium; Mixed shrub - wet forb
	S:Bl	**Sxw**, **Bl**, **Cw**	**Sxw**, **Bl**, **Cw**	
	Cw	***cold wet soils***		•patches of wet alder vegetation common.
	Pl	**Sxw**, **Bl**, **Pl**, **Cw**	**Sxw**, **Bl**, **Cw**, **Pl**	
	D:Act	***light deficits (vegetation overtop)***		
		Sxw, **Pl**, **Act**	Sxw, **Pl**, **Act**	

- •low-productivity sites for timber; difficult to reforest due to cold, wet soils and frequent summer frost;
- •survival and growth of planted tree species (**all species**) generally poor except on raised microsites (natural or artificial); little affected by level of canopy removal;
- •**Pl** is not common on these sites; mature **Pl** not well adapted to sites with near-surface water table;
- •risk of summer frost damage to planted **Sxw**, **Bl**, and **Cw** may be somewhat reduced by leaving partial tree or shrub canopy or by planting in mixtures with deciduous species; effects may be overwhelmed by cold air accumulation if large upslope cold air source is present;
- •advance **Sxw** and **Bl** regeneration <25 cm tall frequently of good form and moderate vigour; may contribute to stocking;
- •soils very susceptible to rutting and compaction;
- •trees with large, dense crowns exposed to winds by logging generally very susceptible to windthrow.

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

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

[a]No previous equivalent (npe)

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

BEC				Relative soil moisture regime				
unit	0	1	2	3	4	5	6	7
BGxh3	ED	ED	ED	ED	ED	SD	M	W
BGxw2	ED	ED	ED	ED	ED	SD	M	W
IDFxw	ED	ED	VD	VD	MD	SD	M	W
IDFxm	ED	ED	VD	VD	MD	SD	M	W
SBPSxc	ED	ED	VD	VD	MD	SD	M	W
SBPSdc	ED	ED	VD	MD	SD	F	M-VM	W
SBPSmk	ED	VD	VD	MD	SD	F	M-VM	W
IDFdk3	ED	VD	VD	VD	MD	F	M	W
IDFdk4	ED	VD	VD	VD	MD	F	M	W
IDFdw	ED	VD	VD	MD	MD	F	VM	W
IDFmw2	VD	VD	VD	MD	SD	F	VM	W
MSxk	VD	VD	VD	VD	MD	F	M	W
MSxv	VD	VD	VD	MD	SD	F	VM	W
SBPSmc	VD	VD	VD	MD	SD	F	M-VM	W
SBSdw1	VD	MD	MD	SD	SD	F	M	W
SBSdw2	VD	MD	MD	SD	SD	F	M	W
SBSmh	VD	MD	MD	SD	SD	M	VM	W
SBSmw	VD	MD	MD	SD	F	M	VM	W
SBSmc1	VD	MD	MD	SD	F	M	VM	W
SBSmc2	VD	MD	MD	SD	F	M	VM	W
SBSwk1	VD	MD	SD	F	F	M	VM	W
ICHdk	VD	VD	VD	MD	SD	M	VM	W
ICHmk3	VD	MD	MD	SD	F	M	VM	W
ICHwk2	VD	MD	SD	F	F	M	VM	W
ICHwk4	VD	MD	SD	F	F	M	VM	W
ESSFxv	VD	VD	MD	MD	SD	F	M	W
ESSFdc2	VD	MD	MD	SD	SD-F	M	VM	W
ESSFwk1	MD	MD	SD	F	M	M	VM	W
ESSFwc3	MD	MD	SD	F	M	M	VM	W

Actual Moisture Regime Codes:

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

TABLE 5.1.2 *Bog Species Importance Table*

	Species	Wb01	Wb02	Wb03	Wb04	Wb05	Wb06	Wb07	Wb08
Trees	*Picea mariana*	▮▮▮▮	▮▮▮	▮▮▮▮▮	▮	▮▮▮▮	▮▮▮	▮	▮▮▮▮
	Larix laricina			▮▮			▮▮▮▮		▮
	Tsuga heterophylla		▮		▮▮▮▮			▮	
	Pinus contorta var. *latifolia*	▮	▮▮▮		▮	▮	▮	▮▮▮	▮
	Picea X	▮	▮	▮	▮▮	▮	▮	▮▮▮	▮▮
	Thuja plicata		▮		▮			▮	
	Pinus contorta var. *contorta*								
	Chamaecyparis nootkatensis								
Shrubs	*Ledum groenlandicum*	▮▮▮▮▮	▮▮▮▮	▮▮▮▮	▮▮	▮▮▮	▮▮▮	▮▮▮	▮▮▮
	Betula nana	▮	▮▮	▮	▮	▮▮▮▮	▮▮▮▮	▮▮▮	▮▮▮
	Salix myrtillifolia			▮		▮	▮▮		▮
	Lonicera involucrata	▮	▮	▮		▮		▮▮	▮
	Salix pedicellaris	▮	▮			▮	▮▮	▮	▮
	Myrica gale								
	Vaccinium uliginosum			▮					
	Juniperus communis								
Herbs and Dwarf Shrubs	*Oxycoccus oxycoccos*	▮▮	▮▮	▮	▮▮	▮▮	▮	▮▮	▮
	Gaultheria hispidula	▮▮▮	▮	▮	▮	▮	▮	▮	▮
	Vaccinium vitis-idaea			▮▮▮		▮	▮▮	▮	
	Rubus chamaemorus	▮	▮▮	▮▮	▮▮▮▮	▮	▮	▮	▮
	Carex aquatilis/sitchensis	▮	▮	▮	▮	▮▮▮	▮▮▮▮	▮▮▮▮	▮▮
	Carex disperma	▮	▮	▮	▮	▮	▮	▮	▮▮▮▮
	Carex tenuiflora					▮		▮	▮▮
	Comarum palustre	▮	▮		▮	▮▮	▮	▮	▮▮▮
	Equisetum arvense	▮	▮	▮▮		▮	▮	▮▮	▮▮
	Carex pauciflora	▮	▮▮		▮	▮	▮	▮	▮
	Andromeda polifolia		▮▮	▮		▮	▮		
	Empetrum nigrum	▮		▮	▮▮	▮	▮	▮▮	▮
	Carex limosa	▮	▮		▮	▮	▮	▮	▮
	Menyanthes trifoliata		▮		▮	▮	▮	▮	▮
	Eriophorum angustifolium		▮▮		▮▮	▮		▮	▮
	Kalmia microphylla		▮▮		▮▮	▮		▮	
	Scheuchzeria palustris		▮						
	Drosera anglica								
	Drosera rotundifolia		▮	▮	▮	▮		▮	
	Coptis trifolia				▮			▮	
	Carex pluriflora		▮						
	Fauria crista-galli								
	Carex livida				▮				
	Sanguisorba officinalis								
	Triantha glutinosa		▮					▮	
	Trichophorum cespitosum		▮					▮	
	Rhynchospora alba								
	Agrostis aequivalvis								
Lichens and Mosses	*Sphagnum* Group I	▮▮▮▮▮	▮▮▮▮▮	▮▮▮	▮▮▮▮▮	▮▮▮▮	▮▮▮▮	▮▮▮▮▮	▮▮▮
	Pleurozium schreberi	▮▮▮	▮▮	▮▮▮▮	▮▮▮▮	▮▮	▮	▮▮	▮▮
	Hylocomium splendens	▮		▮▮▮▮		▮	▮		▮▮
	Aulacomnium palustre	▮▮	▮	▮	▮	▮▮	▮▮▮▮	▮▮▮	▮▮
	Tomentypnum nitens	▮		▮		▮▮▮	▮▮▮▮	▮▮	▮▮▮
	Sphagnum Group III	▮	▮	▮	▮	▮			▮
	Cladina spp.	▮	▮	▮▮	▮	▮	▮		
	Cladonia spp.	▮	▮	▮		▮		▮	
	Sphagnum Group IV								
	Racomitrium lanuginosum								
	Siphula ceratites								
	Campylopus atrovirens								

Wb09	Wb10	Wb11	Wb12	Wb13	Wb50	Wb51	Wb52	Wb53	Common Name
▮▮▮▮	▮	▮▮▮▮	▮						black spruce
		▮							tamarack
		▮		▮	▮▮	▮▮	▮	▮	western hemlock
	▮▮▮	▮▮	▮▮						lodgepole pine
▮▮	▮▮	▮	▮						spruce
		▮		▮	▮	▮▮	▮▮	▮▮	western redcedar
					▮▮	▮▮▮	▮▮▮	▮▮▮▮	shore pine
						▮▮	▮▮	▮▮▮▮▮	yellow-cedar
▮▮▮	▮▮	▮▮▮	▮▮	▮	▮▮▮▮	▮▮▮	▮▮	▮▮▮	Labrador tea
▮▮	▮▮	▮▮▮	▮▮						scrub birch
▮▮		▮							bilberry willow
▮▮		▮							black twinberry
▮	▮	▮▮	▮▮	▮					bog willow
				▮	▮▮▮	▮▮	▮▮▮	▮	sweet gale
▮						▮▮	▮▮	▮▮	bog blueberry
						▮▮	▮▮▮▮	▮▮	common juniper
▮▮	▮▮	▮▮▮	▮▮	▮▮	▮▮▮	▮▮	▮▮	▮	bog cranberry
▮▮	▮	▮▮							creeping-snowberry
▮▮						▮	▮	▮	lingonberry
▮	▮	▮	▮	▮	▮	▮▮▮	▮	▮	cloudberry
▮▮	▮▮	▮▮	▮	▮▮	▮▮	▮▮	▮		water sedge/Sitka sedge
▮▮		▮							soft-leaved sedge
▮	▮	▮▮	▮						sparse-leaved sedge
▮	▮	▮▮	▮▮	▮▮					marsh cinquefoil
▮▮▮▮▮	▮	▮							common horsetail
	▮▮▮▮	▮▮	▮	▮	▮	▮		▮	few-flowered sedge
▮		▮▮	▮▮▮	▮	▮	▮▮	▮▮▮	▮	bog-rosemary
▮▮	▮▮				▮▮	▮▮▮	▮▮	▮▮▮	crowberry
▮	▮▮	▮▮	▮▮▮	▮▮▮▮					shore sedge
		▮▮▮▮	▮▮	▮▮▮	▮	▮		▮	buckbean
	▮▮▮	▮▮	▮▮	▮▮▮		▮▮▮	▮▮▮	▮▮	narrow-leaved cotton-grass
	▮▮▮	▮▮	▮▮	▮▮	▮▮▮	▮▮	▮▮	▮▮▮	western bog-laurel
			▮▮▮▮	▮					scheuchzeria
			▮▮	▮▮		▮	▮▮		great sundew
	▮	▮▮	▮	▮	▮▮	▮▮	▮▮▮	▮▮	round-leaved sundew
				▮	▮	▮▮	▮▮	▮▮	three-leaved goldthread
						▮▮	▮	▮	many-flowered sedge
					▮	▮	▮▮	▮▮	deer-cabbage
						▮▮	▮▮	▮▮	pale sedge
					▮	▮▮▮	▮▮▮▮	▮▮	great burnet
		▮		▮▮	▮	▮▮	▮▮	▮▮	sticky false-asphodel
				▮		▮▮	▮▮▮▮▮	▮▮▮▮▮	tufted clubrush
					▮▮	▮▮	▮▮▮	▮▮	white beak-rush
				▮		▮	▮▮	▮▮	Alaska bentgrass
▮▮▮▮	▮▮▮▮▮	▮▮▮▮	▮▮▮▮	▮▮▮▮▮	▮▮▮▮▮	▮▮▮▮▮	▮▮▮	▮▮	peat-moss Group I
▮▮▮	▮▮	▮▮		▮	▮▮	▮▮	▮	▮▮	red-stemmed feathermoss
▮▮▮		▮			▮	▮		▮	step moss
▮▮▮	▮	▮▮	▮▮	▮	▮▮			▮	glow moss
▮▮		▮▮	▮▮	▮					golden fuzzy fen moss
▮	▮	▮▮	▮▮	▮▮	▮▮	▮▮▮▮▮	▮▮▮▮	▮▮▮	peat-moss Group III
▮	▮	▮	▮		▮	▮▮	▮▮▮▮	▮▮	reindeer lichens
▮	▮					▮	▮▮▮	▮▮	clad lichens
				▮	▮	▮▮	▮▮▮	▮	peat-moss Group IV
						▮▮	▮▮▮▮	▮▮▮	hoary rock-moss
						▮	▮▮▮	▮	northern waterfingers
							▮▮	▮	bristly swan-neck moss

General Description

Scheuchzeria – Peat-moss bogs are uncommon in the sub-boreal and boreal forests at elevations below 1000 m. They usually occur as small inclusions in larger peatlands on floating mats with continually saturated peat and restricted water movements.

Vegetation is characterized by species tolerant of permanent saturation but intolerant of deep flooding. A low shrub layer of *Salix pedicellaris* occurs on some sites but dwarf shrubs such as *Andromeda polifolia*, *Kalmia microphylla*, and *Oxycoccus oxycoccos* are more prevalent. *Scheuchzeria palustris* is always prominent and *Carex limosa* occurs on most sites. The moss layer is dominated by *Sphagnum* Group I species.

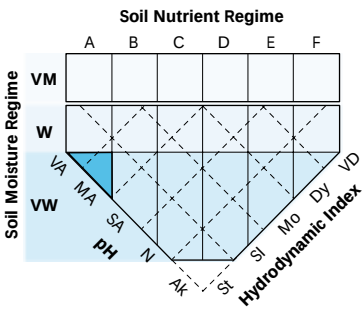
Soils are mostly fibric *Sphagnum* peat and can be floating mats. The watertable is at the surface but does not flood more than several centimetres above the soils surface. The water is very stagnant and low in dissolved oxygen.

Characteristic Vegetation

Tree layer (0 - **0** - 0)
Shrub layer (0 - **8** - 20)
Salix pedicellaris
Herb layer (20 - **37** - 90)
Andromeda polifolia, ***Carex limosa***, *Eriophorum chamissonis, Kalmia microphylla, Oxycoccus oxycoccos,* ***Scheuchzeria palustris***.

Moss layer (60 - **67** - 100)
***Sphagnum* Group I**

Wetland Edatopic Grid



Comments

*The **Wb12** Site Association requires permanent saturation with acidic waters in combination with no flooding. It therefore occurs in wetlands where water regimes are relatively stable and on sites with ungrounded peat that can rise and fall with changes in watertable. On sites with higher pH, the **Wb12** is replaced by the **Wf07** or **Wf08**.*

*In the eastern boreal areas, ecosystems that are very similar to **Wb12** but have* Sarracenia purpurea *and* Chamaedaphne calyculata *occur (see additional units).*