TABLE 4. Climatic characteristics for the biogeoclimatic zones of British Columbia

Zone	Range and reference station	Lat. (° ′)	Long. (° ′)	Elevation (m)	Mean annual precip. (mm)	Mean summer precip. (May-Sept) (mm)	Mean precip. of driest month (mm)	Mean precip. of wettest month (mm)	Driest month	Wettest month
AT	Old Glory Mtn.	49 09	117 55	2347	755.5	287.0	40.0	84.1	Jul	Dec
BG	Max			588	335.7	174.5	17.3	55.4		
	Min			297	205.6	98.0	8.0	27.3		
	Kamloops	50 40	120 20	379	241.7	111.4	8.0	36.1	Mar	Jan
BWBS	Max			840	503.7	305.3	24.3	879.0		
	Min			382	327.1	144.7	8.3	41.1		
	Fort Nelson A	58 50	122 35	382	451.8	297.9	16.7	84.3	Apr	Jul
CDF	Max			223	1262.6	238.3	38.6	232.9		
	Min			8	647.2	107.3	13.4	119.2		
	Victoria Int'l A	48 39	123 26	19	872.9	141.9	18.1	157.3	Jul	Dec
CWH	Max			671	4386.8	1162.0	151.0	625.4		
	Min			0	990.2	159.3	16.8	145.7		
	Haney UBC RF Admin	49 16	122 34	143	2140.1	467.8	65.5	331.7	Jul	Dec
ESSF	Max			1862	1995.4	424.5	64.8	297.4		
	Min			863	514.1	204.6	26.6	57.4		
	Boss Mountain	52 06	120 53	1532	1177.1	401.6	63.5	140.6	May	Dec
ICH	Max			1085	1419.0	439.3	57.2	224.3		
	Min			314	497.7	199.9	21.4	57.8		
	Revelstoke	51 00	118 12	456	1063.7	325.0	51.4	177.0	Apr	Jan
IDF	Max			1128	1198.9	290.7	37.6	208.8		
	Min			122	295.1	107.5	13.5	34.8		
	150 Mile House	52 07	121 56	738	414.2	214.0	15.8	60.7	Apr	Jun
MH	Hollyburn Ridge	49 23	123 12	930	2954.3	694.4	106.9	434.8	Jul	Dec
MS	Max			1554	663.8	252.1	38.5	108.1		
	Min			1128	380.8	158.2	17.9	45.2		
	Peachland Brenda Mines	49 52	120 00	1520	638.3	197.0	29.3	89.1	Apr	Dec
PP	Max			939	604.5	270.3	30.7	77.6		
	Min			244	319.5	86.3	11.0	34.5		
	Kelowna	49 54	119 28	354	332.2	136.3	15.3	45.1	Apr	Dec
SBPS	Max			1219	517.8	299.8	21.1	86.5		
	Min			914	464.1	242.6	20.8	36.4		
	Alexis Creek Tautri Creek	52 33	123 11	1219	464.1	242.6	20.8	57.6	Apr	Jun
SBS	Max			1245	1588.2	352.6	36.8	278.7		
	Min			488	438.9	188.9	15.2	49.8		
	Prince George A	53 63	122 40	676	628.3	300.8	27.4	68.2	Apr	Aug
SWB	Cassiar	59 17	129 50	1078	699.5	275.1	25.7	84.2	Apr	Oct

Zone key

AT Alpine Tundra
BG Bunchgrass
BWBS Boreal White and Black Spruce
CDF Coastal Douglas-fir
CWH Coastal Western Hemlock
ESSF Engelmann Spruce — Subalpine Fir
ICH Interior Cedar — Hemlock
IDF Interior Douglas-fir
MH Mountain Hemlock
MS Montane Spruce
PP Ponderosa Pine
SBPS Sub-Boreal Pine — Spruce
SBS Sub-Boreal Spruce
SWB Spruce — Willow — Birch

TABLE 5. Occurrence[a] of trees in the biogeoclimatic zones of British Columbia

Gymnosperms	BG	PP	IDF	ICH	MS	SBPS	SBS	BWBS	SWB	MH	CDF	CWH	ESSF	AT[b]
Abies amabilis (amabilis fir)	-	-	-	+	-	-	-	-	-	+++	-	+++	(+)	-
A. grandis (grand fir)	-	-	++	++	+	-	-	-	-	-	++	+	-	-
A. lasiocarpa (subalpine fir)	-	-	-	++	+++	(+)	+++	++	+++	++	-	+	+++	-
Chamaecyparis nootkatensis (yellow-cedar)	-	-	-	-	-	-	-	-	-	+++	-	++	(+)	-
Juniperus scopulorum (Rocky Mountain juniper)	+	+	++	-	-	-	+	(+)	-	-	++	(+)	-	-
Larix laricina (tamarack)	-	-	-	-	-	-	(+)	++	-	-	-	-	-	-
L. lyallii (alpine larch)	-	-	-	-	-	-	-	-	-	-	-	-	++	-
L. occidentalis (western larch)	-	+	+++	++	+++	-	-	-	-	-	-	-	+	-
Picea engelmannii (Engelmann spruce)	-	-	+	++	+++	-	-	-	-	+	-	-	+++	-
P. engelmannii x *glauca* (hybrid white spruce)	-	(+)	++	++	+++	+	+++	-	-	-	-	-	++	-
P. glauca (white spruce)	-	(+)	+	-	+	+++	++	+++	+++	-	-	-	+	-
P. glauca x *sitchensis* (Roche spruce)	-	-	-	++	-	-	-	-	-	(+)	-	++	-	-
P. mariana (black spruce)	-	-	-	+	-	-	++	+++	+	-	-	-	-	-
P. sitchensis (Sitka spruce)	-	-	-	-	-	-	-	-	-	+	+	+++	-	-
Pinus albicaulis (whitebark pine)	-	-	-	-	-	-	-	-	-	+	-	-	++	-
P. banksiana (jack pine)	-	-	-	-	-	-	-	(+)	-	-	-	-	-	-
P. contorta (lodgepole pine)	(+)	-	+++	++	+++	+++	+++	+++	++	+	++	++	+++	-
P. flexilis (limber pine)	-	-	(+)	-	-	-	-	-	-	-	-	-	(+)	-
P. monticola (western white pine)	-	-	+	++	+	-	-	-	-	+	+	++	+	-
P. ponderosa (ponderosa pine)	+	+++	+++	+	-	-	-	-	-	-	-	-	-	-
Pseudotsuga menziesii (Douglas-fir)	+	++	+++	++	+++	+	++	-	-	(+)	+++	+++	+	-
Taxus brevifolia (western yew)	-	-	+	++	-	-	-	-	-	-	++	++	-	-
Thuja plicata (western redcedar)	-	(+)	++	+++	+	-	+	-	-	+	++	+++	+	-
Tsuga heterophylla (western hemlock)	-	-	+	+++	+	-	(+)	-	-	++	+	+++	+	-
T. mertensiana (mountain hemlock)	-	-	-	+	-	-	-	-	-	+++	-	+	++	-

TABLE 5. Continued

Angiosperms	BG	PP	IDF	ICH	MS	SBPS	SBS	BWBS	SWB	MH	CDF	CWH	ESSF	AT[b]
Acer macrophyllum (bigleaf maple)	-	-	+	-	-	-	-	-	-	-	++	++	-	-
Alnus rubra (red alder)	-	-	-	-	-	-	-	-	-	-	+++	+++	-	-
Arbutus menziesii (arbutus)	-	-	-	-	-	-	-	-	-	-	++	+	-	-
Betula neoalaskana (Alaska paper birch)	-	-	-	-	-	-	-	++	-	-	-	-	-	-
B. occidentalis (water birch)	+	+	+	(+)	-	-	(+)	+	-	-	-	-	-	-
B. papyrifera (paper birch)	+	+	++	++	+	-	++	++	-	-	+	+	-	-
Cornus nuttallii (western flowering dogwood)	-	-	+	-	-	-	-	-	-	-	++	++	-	-
Populus balsamifera ssp. *balsamifera* (balsam poplar)	-	-	-	-	-	-	+	++	+	-	-	-	-	-
P. balsamifera ssp. *trichocarpa* (black cottonwood)	+	+	+	++	+	+	++	+	-	-	++	++	+	-
P. tremuloides (trembling aspen)	+	++	+++	++	++	+	+++	+++	+	-	+	+	+	
Prunus emarginata (bitter cherry)	-	-	+[c]	++[c]	-	-	+[c]	-	-	-	++	+	-	-
Quercus garryana (Garry oak)	-	-	-	-	-	-	-	-	-	-	++	(+)	-	-
Rhamnus purshiana (cascara)	-	-	-	++[d]	-	-	-	-	-	-	++	+	-	-

[a] Occurrence classes: +++(abundant); ++(common); +(present but uncommon); (+)(very rare); -(absent).
[b] Tree species occur only in krummholz form in the Alpine Tundra zone.
[c] *P. emarginata* occurs in these zones, but only rarely as a (small) tree.
[d] Rarely as a small tree.

Chapter 10: Interior Douglas-fir Zone

by

G.D. Hope, W.R. Mitchell, D.A. Lloyd, W.R. Erickson, W.L. Harper, and B.M.Wikeem

LOCATION AND DISTRIBUTION

The Interior Douglas-fir zone (IDF) dominates the low- to mid-elevation landscape of south-central interior British Columbia (Figure 34), between 49° and 52° 30′N latitude. The zone also extends south into Washington, Oregon, Idaho, and Montana, and east into Alberta. In British Columbia, the IDF occupies the rolling and valley terrain of the southern Interior Plateau and southern Rocky Mountain Trench, and also fingers into the lee side of the Coast Mountains. Lowest elevations of the zone are between 350 (in some valleys) and 600 m; upper elevations are at 900-1450 m.

Typically, the IDF occurs at elevations below the Montane Spruce zone and, where the valleys are deep enough, above the Ponderosa Pine zone. In the northern portions of the IDF, the zone is surrounded by the Sub-Boreal Pine — Spruce and Sub-Boreal Spruce zones, and the Bunchgrass zone is found below the IDF along the Fraser and Chilcotin rivers. In the coast transition areas, the IDF occurs below the Coastal Western Hemlock zone.

ECOLOGICAL CONDITIONS

The IDF has a continental climate characterized by warm, dry summers, a fairly long growing season, and cool winters (Figure 35; Table 4). The main factor controlling the climate is the rainshadow created in the lee of topographic barriers (the Coast, Cascade, and Columbia mountains) to the prevailing easterly flowing air. Mean annual temperature is 1.6-9.5°C. The average temperature is below 0°C for 2-5 months, and above 10°C for 3-5 months. Mean annual precipitation ranges from 300 to 750 mm, except in the wettest areas where precipitation exceeds 1000 mm. Twenty to 50% of the precipitation falls as snow. Substantial growing season moisture deficits are common and frosts can occur at any time.

Open to closed, mature forests containing Douglas-fir cover much of the IDF landscape. Pure Douglas-fir climax stands are common, and often have an open canopy, because ground fires were common historically, and survival of mature trees with thick bark was favoured. Where crown fires have commonly occurred in the past, there are extensive mixed stands of Douglas-fir and lodgepole pine, often with scattered large Douglas-fir veterans. Ponderosa pine occurs at lower elevations south of Clinton and Little Fort. In very dry parts of the zone, it forms early seral stands on zonal sites, but is eventually replaced by Douglas-fir. Ponderosa pine persists as a climax species on drier sites, and even in the moister subzones it occurs on dry, south-facing slopes. Hybrid white spruce (*Picea engelmannii* x *glauca*) occurs on moister sites and is most common at higher elevations transitional to the Montane Spruce zone. Western redcedar sometimes occurs in mature forests on zonal and wetter sites in the moister areas transitional to the Coastal Western Hemlock or Interior Cedar — Hemlock zones. Lodgepole pine is more widespread at higher elevations where it is a common successional species. Trembling aspen is also a widely distributed seral species throughout the zone. Grand fir is restricted to the southwestern, wettest part of the

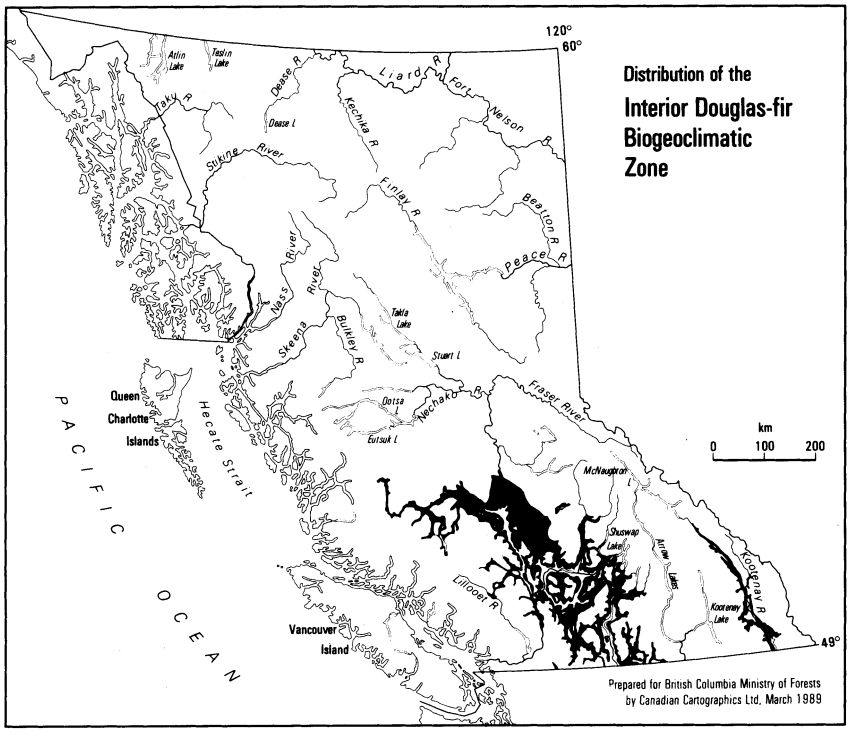

FIGURE 34. Interior Douglas-fir zone.

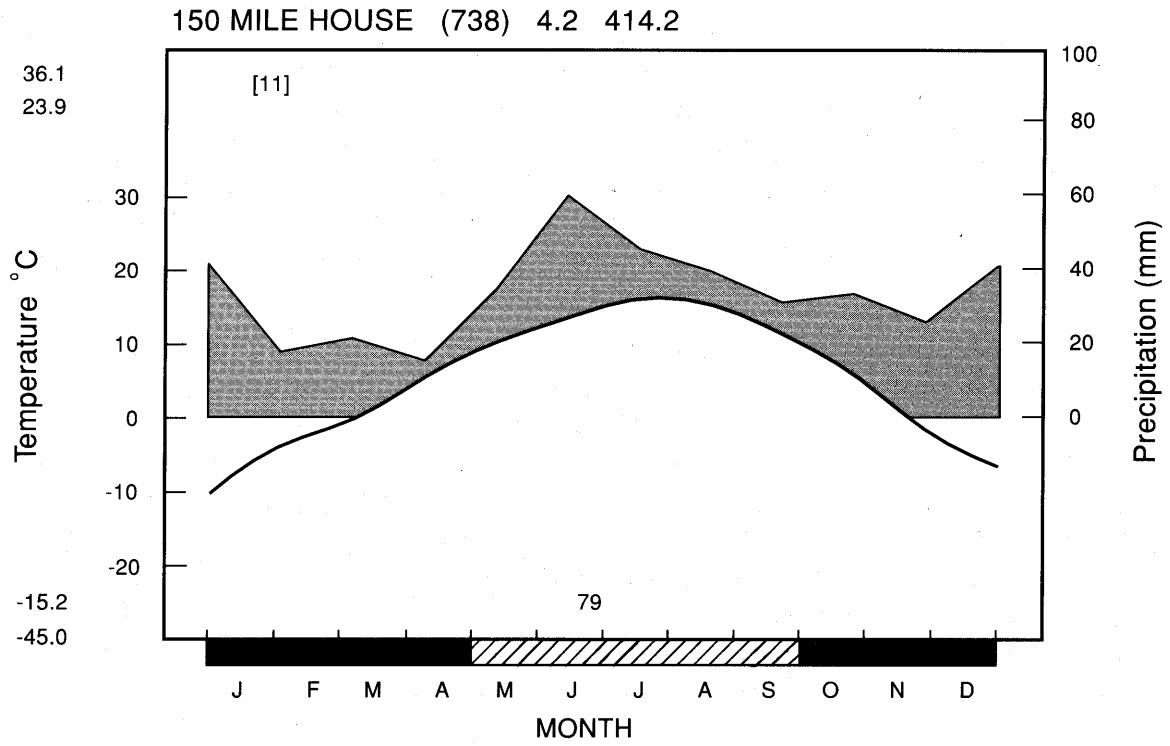

FIGURE 35. Representative climatic diagram for the Interior Douglas-fir zone.

IDF. Paper birch is common on moist sites and in the wettest subzones. Western larch is restricted to the southeastern part of the zone, where it frequently occurs after fire. *Juniperus scopulorum* (Rocky Mountain juniper) is found occasionally at lower elevations, usually on dry sites.

A combination of edaphic and topographic conditions and fire history has led to the development of large grassland communities in parts of the IDF. These grasslands have been modified by grazing of domestic livestock and influenced by reduced fire frequency since the turn of the century. Grassland in good to excellent range condition is dominated by *Agropyron spicatum* (bluebunch wheatgrass), together with *Festuca idahoensis* (Idaho fescue) in the south, *F. scabrella* (rough fescue) in the central parts of the zone, and *Stipa richardsonii* (spreading needlegrass) and *Festuca saximontana* (Rocky Mountain fescue) in the northern, Chilcotin grasslands. *Artemisia frigida* (pasture sage), *Koeleria macrantha* (junegrass), and *Poa pratensis* (Kentucky bluegrass) are also common and increase in abundance under grazing pressure. Past overgrazing has also shifted dominance from the bunchgrasses (fescues and bluebunch wheatgrass) toward other less palatable "increaser" species such as *Lupinus sericeus* (silky lupine), *Astragalus miser* (timber milk-vetch), and *Achillea millefolium* (yarrow), and weedy invaders such as *Bromus tectorum* (cheatgrass), *Erigeron compositus* (cut-leaved daisy), and *Tragopogon* spp. (salsifies). Soils of the IDF grasslands are mainly Orthic Dark Brown Chernozems at lower elevations and Orthic Black and Dark Grey Chernozems higher in the zone. Where large areas of grassland ecosystems occur, they have been mapped as grassland phases of IDF subzones.

Zonal ecosystems in the IDF occur on well- to moderately well-drained upland sites on morainal deposits derived from basic volcanic bedrock. Soils are typically Orthic or Dark Gray Luvisols, and Eutric or Dystric Brunisols. Generally soils in the zone have medium to rich nutrient status, because of the predominance of base-rich bedrock and the low rates of leaching in the dry climates. Humus form development usually results in Moders, with occasional Mors and Mullmoders. Leptomoders are common on lower elevation zonal ecosystems, whereas Mormoders and Hemimors are most common at upper elevations. The Mormoders are most prevalent where there is a grassy ground cover.

Non-forested wetlands are common in the IDF. These range from *Typha latifolia* (cattail) and *Scirpus lacustris* (great bulrush) marshes in shallow depressions and around open water, to sedge fens of *Carex aquatilis* (water sedge), *C. rostrata* (beaked sedge), and *C. lasiocarpa* (slender sedge), to saline meadows dominated by *Distichlis stricta* (alkali saltgrass), *Puccinellia nuttalliana* (Nuttall's alkaligrass), and *Hordeum jubatum* (foxtail barley). Many of the fens include a tall or low shrub canopy of willows (*Salix* spp.) and sometimes *Betula glandulosa* (scrub birch) or *B. pumila* (swamp birch). Shrub-carrs dominated by scrub birch occur at the drier edges of many fens, especially in the northern areas. Tall willow swamps often follow small streams and drainage channels. Bogs are uncommon in the IDF.

NOTES ON CLASSIFICATION

The northern portion of the IDF in the Cariboo-Chilcotin area was classified by Krajina (1965, 1969) as a southern subzone of his Cariboo — Aspen — Lodgepole Pine zone (CALP), a zone the Ministry of Forests no longer recognizes. Large grassland areas within the IDF are classified as grassland phases of the zone. Part of the IDF in the East Kootenays is now in the Ponderosa Pine zone.

SUBZONES

Seven subzones have been recognized in the IDF (Table 21). The very dry subzones lack lodgepole pine, *Linnaea borealis* (twinflower), *Paxistima myrsinites* (falsebox), and *Chimaphila umbellata* (prince's pine), and commonly have ponderosa pine (Figure 36). The two moist and wet subzones have some western redcedar, paper birch as a seral species, low cover of *Calamagrostis rubescens* (pinegrass), but no *Arctostaphylos uva-ursi* (kinnikinnick). Generally, with increasing effective moisture (whether as a result of greater precipitation or cooler temperatures) there is a trend from open forest with grassy ground cover to closed forest with more shrubs and mixed forb-grass-moss ground cover.

TABLE 21. Synopsis of subzones in the Interior Douglas-fir zone (IDF)

Subzone	Code	Old code
Very Dry Hot IDF	IDFxh	(IDFa1/a3)
Very Dry Warm IDF	IDFxw	(IDFa2)
Very Dry Mild IDF	IDFxm	(IDFa4)
Dry Mild IDF	IDFdm	(IDFf/g3)
Dry Cool IDF	IDFdk	(IDFb/d)
Moist Warm IDF	IDFmw	(IDFj)
Wet Warm IDF	IDFww	(IDFe)

The very dry subzones occupy some of the major valleys of the southern Interior Plateau. The IDFxh occurs in the lower elevations of the Okanagan valley south of Enderby, along the Similkameen valley, along the North and South Thompson rivers from north and east of Kamloops west to the Fraser River, and in the Fraser River valley and its tributaries in the Lytton-Lillooet area. The IDFxw occupies lower elevations of major valleys in the Clinton-Cache Creek area and midslopes of the Fraser River valley west of Clinton. The IDFxm occupies lower elevations of the Chilcotin and Fraser river valleys from south of Alexandria to west of Clinton.

The dry IDF subzones occur at moderate elevations on the lee side of the Coast, Cascade, and Purcell mountains. The IDFdk, the "modal" IDF subzone, occupies lower to middle elevations of the southern Interior Plateau in the lee of the Coast and Cascade mountains, extending east from the Tatla Lake area to north of Williams

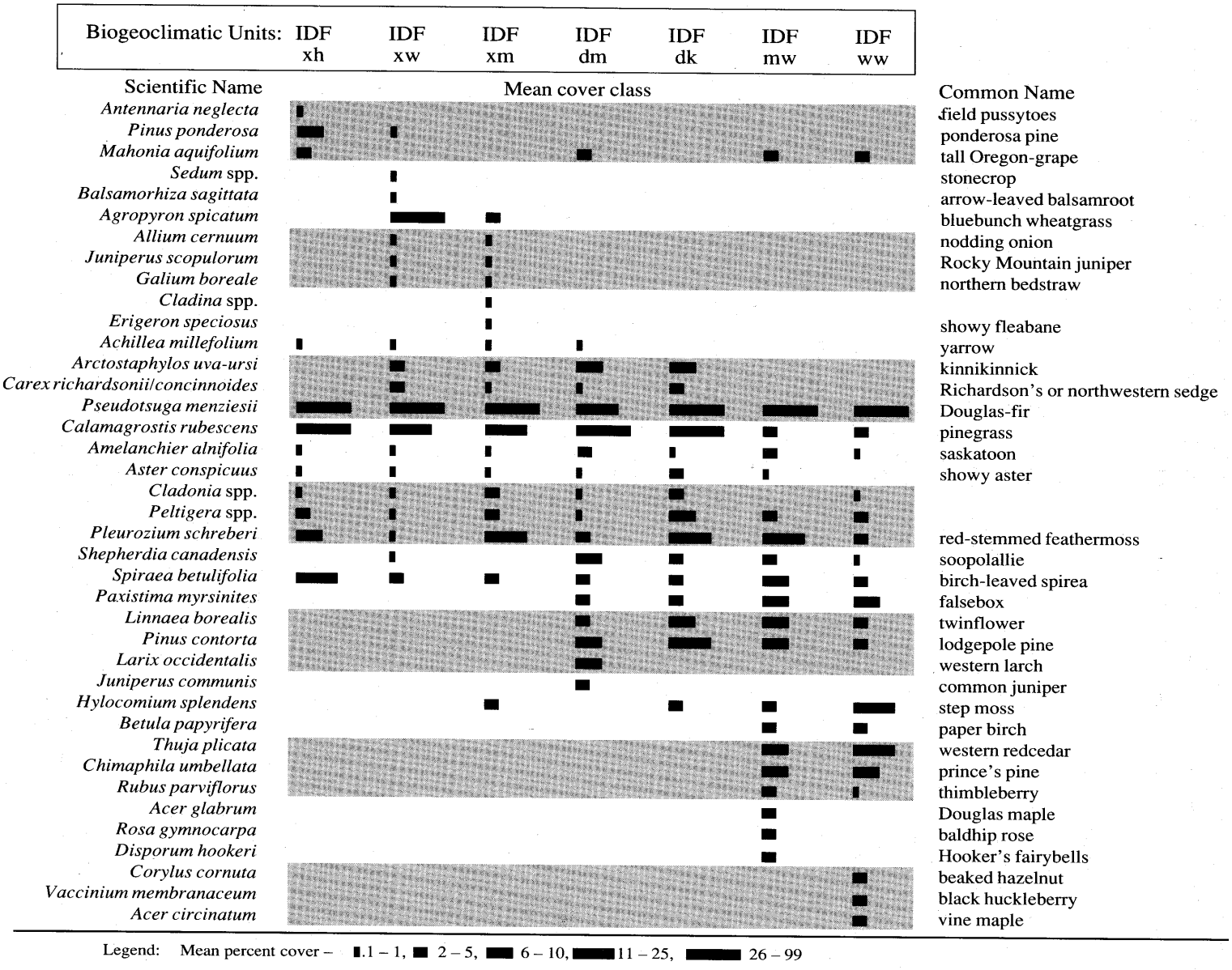

FIGURE 36. Zonal vegetation of subzones of the Interior Douglas-fir zone.

Lake and then south, to southeast of Princeton. The IDFdm occurs in the Okanagan Highlands and along the Kettle River drainage, north of Grand Forks, and in the valley bottoms and on lower slopes of the Rocky Mountain Trench and its major tributaries south of the Blaeberry River. This subzone is distinguished by the presence of western larch.

The moister IDFmw occurs in a narrow band transitional to the Interior "wet belt" from east of Peachland to Salmon Arm, and then northwest to the North Thompson River and its tributaries near Clearwater. The IDFww subzone occurs on the lee side of the Coast Mountains along the eastern end of the Klinaklini and Atnarko river valleys, along the Lillooet River valley east of Pemberton, and in the Fraser River valley around Boston Bar.

SOME REPRESENTATIVE SITE ASSOCIATIONS

The four site associations described below are common in the IDF. They form a typical sequence of ecosystems in the IDFdk on the southern Interior Plateau (Figure 37).

Douglas-fir — Lodgepole pine — Pinegrass — Feathermoss

This association is common in the dry subzones. It is the zonal association in the IDFdk and is similar to associations that occur on sites with "drier" relative soil moisture regimes in the moist and wet subzones. It occurs primarily on moderately well- and well-drained, loamy, morainal deposits derived from basic volcanic bedrock. Soils are predominantly Eutric and Dystric Brunisols and Gray Luvisols. The most common humus forms are Hemimors and Mormoders. The zonal association in the IDFdm subzone is similar to this one, but differs in that western larch and *Juniperus communis* (common juniper) are found in the IDFdm association.

Mature stands consist of Douglas-fir and lodgepole pine; climax stands can contain only Douglas-fir. The understory contains varying amounts of Douglas-fir regeneration.

The moderately developed shrub layer contains *Spiraea betulifolia* (birch-leaved spirea) and *Shepherdia canadensis* (soopolallie). *Paxistima myrsinites* can occur in moister parts of the subzone and *Rosa acicularis* (prickly rose) in northern areas.

The herb layer has considerable cover of *Calamagrostis rubescens* (pinegrass) and lesser amounts of *Linnaea borealis*, *Arctostaphylos uva-ursi*, *Arnica cordifolia* (heart-leaved arnica), and *Aster conspicuus* (showy aster).

Mosses are infrequent; *Pleurozium schreberi* (red-stemmed feathermoss) is the most common. *Peltigera* spp. and *Dicranum polysetum* (wavy-leaved moss) are often present.

Douglas-fir — Snowberry — Bluebunch wheatgrass

This association occurs on very dry, nutrient-poor to -medium sites, generally on upper, south-facing slopes in the dry and moist subzones. Soils are often shallow and

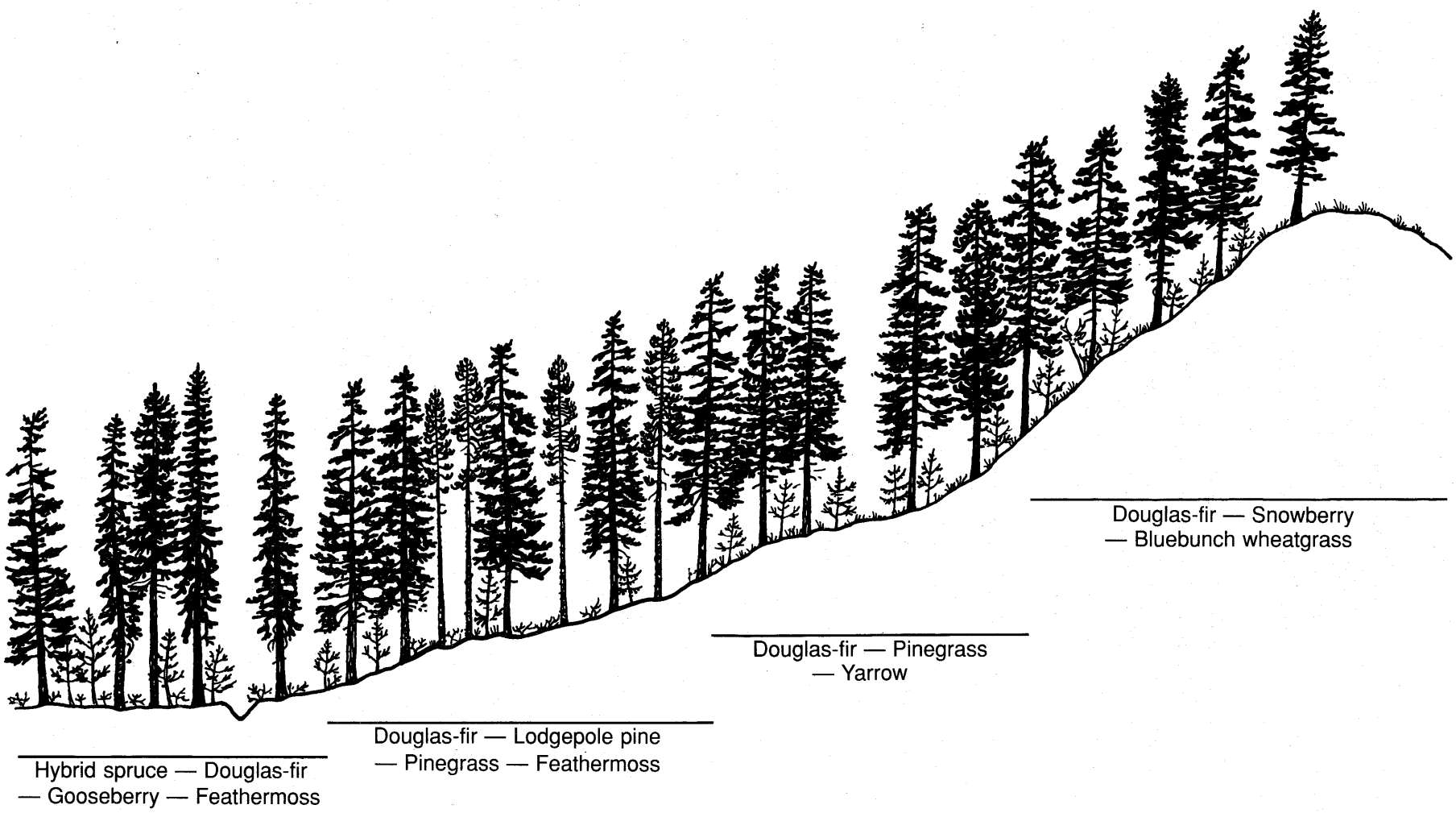

FIGURE 37. Simplified schematic diagram of topographic relationships among four common site associations of a dry, cool subzone of the Interior Douglas-fir zone.

derived from colluvial or morainal deposits. Soils are predominantly Orthic Melanic and Orthic Eutric Brunisols. Humus forms include thin Leptomoders and Mullmoders.

Mature stands have an open tree canopy of Douglas-fir. Similar associations at lower elevations contain ponderosa pine as a seral species.

The shrub layer is dominated by a moderate cover of *Symphoricarpos albus* (common snowberry) and/or *Spiraea betulifolia*. *Amelanchier alnifolia* (saskatoon), and *Juniperus communis* can also occur, and *Ceanothus velutinus* (snowbrush) is common in the south.

The herb layer is moderately well developed and is dominated by *Agropyron spicatum* (bluebunch wheatgrass). There can be a low cover of *Calamagrostis rubescens*. The moss layer is patchy.

Douglas-fir — Pinegrass — Yarrow

This association typically occupies moderately dry, poor to rich sites in middle to upper slope positions in the dry subzones of the IDF. A similar association, but containing ponderosa pine, is the zonal association in the IDFxh subzone. Soils are predominately Eutric and Dystric Brunisols and Gray Luvisols. The most common humus forms are Hemimors and Mormoders.

Mature stands have a moderately open canopy of Douglas-fir. The understory has scattered clumps of Douglas-fir of various ages.

The sparse shrub layer consists of *Spiraea betulifolia* and *Shepherdia canadensis*. *Rosa acicularis* is more common in the north of the subzone.

The herb layer is well developed and dominated by *Calamagrostis rubescens*. There are lesser amounts of *Aster conspicuus* and *Arctostaphylos uva-ursi* and *Achillea millefolium* (yarrow). The moderately developed moss layer contains *Pleurozium schreberi*. In dense, older stands the moss layer can be continuous.

Hybrid spruce — Douglas-fir — Gooseberry — Feathermoss

This association occurs on moist and very moist, nutrient-medium to very rich sites throughout the very dry and dry subzones. It is most extensive along floodplains where the IDF occupies large valley floors; it also occurs as small pockets in depressions, often adjacent to streams. Soils are orthic and gleyed subgroups of Brunisols and Gray Luvisols. Humus forms are Hemihumimors and Hemimors.

Mature stands in this association contain a mix of hybrid white spruce and Douglas-fir, both in the canopy and the understory. A small amount of lodgepole pine is occasionally present.

The understory is diverse. Common shrubs include *Ribes lacustre* (black gooseberry), *Lonicera involucrata* (black twinberry), *Cornus stolonifera* (red-osier dogwood), and *Rosa acicularis*. *Symphoricarpos albus* and *Acer glabrum* (Douglas maple) occur in some areas.

The well-developed herb layer contains *Linnaea borealis*, *Cornus canadensis* (bunchberry), *Calamagrostis rubescens*, and *Osmorhiza chilensis* (mountain sweet-cicely).

Pleurozium schreberi (red-stemmed feathermoss) is consistently present in the poorly to moderately developed moss layer. In northern areas of the subzone the moss layer becomes continuous.

WILDLIFE HABITATS

The factors that most influence the assemblage of species in this zone (Table 22) are the relatively short, cool winters and extensive Douglas-fir forests with variable canopy closure. Low elevation, south-facing aspects attract many animals during winter. Mule Deer, White-tailed Deer, Bighorn Sheep, and Rocky Mountain Elk can migrate long distances (up to 80 km) to winter in this zone. Non-migratory passerine birds descend from higher elevations to form mixed species flocks during the winter months.

This zone has a wide range of habitat niches for wildlife, as a result of the topographic variety and great diversity of overstory and understory vegetation. Douglas-fir forests serve as winter range for many ungulates. In the northern parts of the IDF, Mule Deer require old-growth Douglas-fir stands for forage (litter-fall) and snow interception. In the southern parts of the zone, south aspect forests and dry Douglas-fir and ponderosa pine forests provide winter habitat for Rocky Mountain Elk, Mule Deer, White-tailed Deer, and Bighorn Sheep.

These forests also support a diverse complement of birds that feed on conifer seeds, bark-insects, and small mammals. Some of these forest birds are largely insectivorous, such as the Pileated Woodpecker, Northern Flicker, and Red-breasted Nuthatch. Others, such as Clark's Nutcracker and Red Cross-bill, depend more on conifer seeds. The rare Flammulated Owl nests in old ponderosa pine and Douglas-fir trees in the south Okanagan and Kamloops areas.

Edaphic bunchgrass grasslands support a different group of wildlife species. California and Rocky Mountain bighorn sheep occur where suitable rugged escape terrain is nearby. Mule and White-tailed deer graze these areas in early spring; Golden Eagle and Red-tailed Hawk hunt the grasslands for mice, voles, and ground squirrels. Species more common at lower elevations, such as Badger, Great Basin Pocketmouse, Western Rattlesnake, Gopher Snake, and Great Basin Spadefoot Toad, often occur on the IDF grasslands. Small lakes and potholes within the grasslands serve as breeding grounds for various dabbling and diving ducks such as Northern Pintail, American Wigeon, Mallard, Blue-winged Teal, Lesser Scaup, and American Coot, as well as for the Painted Turtle. Larger lakes and marshes are important staging and breeding areas for a great variety of waterbirds.

TABLE 22. Selected wildlife habitats and species in the Interior Douglas-fir zone (adapted from Wildlife Branch 1989)

Habitat	Habitat distribution	Representative wildlife species	Wildlife species at risk[a]
Old-growth and mature coniferous forest	Extensive	Rocky Mountain Elk, Black-tailed Deer, Mule Deer, White-tailed Deer, Black Bear, Cougar, Bobcat, Coyote, Big Brown Bat, Hoary Bat, Red Squirrel, Southern Red-backed Vole Northern Pygmy-Owl, Blue Grouse, Pileated Woodpecker, Clark's Nutcracker, Red-naped Sapsucker, Red-breasted Nuthatch Rubber Boa, Pacific Treefrog	∇ Flammulated Owl ♦ California Bighorn Sheep, Rocky Mountain Bighorn Sheep, Williamson's Sapsucker
Young seral forest	Extensive	Moose, Rocky Mountain Elk, Mule Deer, White-tailed Deer, Black Bear, Cougar, Coyote, Badger, Northern Pocket Gopher Ruffed Grouse	
South aspect Douglas-fir and ponderosa pine parkland	Common	Rocky Mountain Elk, Mule Deer, White-tailed Deer, Black Bear, Cougar, Coyote, Badger, Big Brown Bat, Northern Pocket Gopher, Golden-mantled Ground Squirrel Swainson's Hawk, Blue Grouse, White-breasted Nuthatch Western Yellow-bellied Racer, Rubber Boa	∇ Townsend's Big-eared Bat, Flammulated Owl, Common Poorwill ♦ California Bighorn Sheep, Rocky Mountain Bighorn Sheep, White-headed Woodpecker, Western Rattlesnake, Gopher Snake
Bunchgrass grassland	Common in some areas	Rocky Mountain Elk, Mule Deer, White-tailed Deer, Black Bear, Cougar, Coyote, Badger, Yellow-bellied Marmot, Golden-mantled Ground Squirrel Golden Eagle, Red-tailed Hawk, Turkey Vulture, Short-eared Owl, Sharp-tailed Grouse, Long-billed Curlew, Sandhill Crane, Black-billed Magpie, Mountain Bluebird Western Yellow-bellied Racer, Great Basin Spadefoot Toad	∇ Burrowing Owl, Prairie Falcon, Common Poorwill ♦ California Bighorn Sheep, Rocky Mountain Bighorn Sheep, Great Basin Pocket Mouse, Lewis' Woodpecker, Western Rattlesnake, Gopher Snake
Rocky cliffs and talus	Limited areal extent	Mountain Goat, Common Pika, Yellow-bellied Marmot, Yellow-pine Chipmunk, Western Long-eared Myotis Turkey Vulture, White-throated Swift Western Yellow-bellied Racer	♦ Western Rattlesnake, Gopher Snake
Agricultural areas	Limited areal extent	Rocky Mountain Elk, Mule Deer, White-tailed Deer, Black Bear, Coyote, Ermine, Columbian Ground Squirrel, Deer Mouse American Kestrel, Canada Goose, Mountain Bluebird	♦ Lewis' Woodpecker

TABLE 22. Continued

Habitat	Habitat distribution	Representative wildlife species	Wildlife species at risk[a]
Riparian areas, wetlands, meadows and floodplains	Common, limited areal extent	Moose, Rocky Mountain Elk, Mule Deer, White-tailed Deer, Black Bear, Lynx, Mink, Big Brown Bat American Kestrel, Blue Grouse, Ruffed Grouse, Sharp-tailed Grouse, Mountain Bluebird, Le Conte's Sparrow Rubber Boa, Northern Alligator Lizard, Western Skink, Western Toad, Wood Frog, Northern Leopard Frog, Great Basin Spadefoot Toad	∇ Tiger Salamander ♦ Grizzly Bear, Great Blue Heron, Yellow-headed Blackbird
Lakes and streams	Common	Black Bear, Mink, Little Brown Myotis, California Myotis, Beaver, Muskrat Bald Eagle, Osprey, Canada Goose, Trumpeter Swan, Canada Goose, Sandhill Crane, Virginia Rail, Eared Grebe, Wood Duck, Bufflehead, Common Goldeneye, Barrow's Goldeneye, American Avocet, Black Tern, Ring-billed Gull, Bonaparte's Gull Painted Turtle, Spotted Frog, Long-toed Salamander, Great Basin Spadefoot Toad	∇ Tiger Salamander ♦ California Gull, Great Blue Heron

[a] Wildlife species and subspecies at risk are those on the preliminary Red and Blue Lists proposed in the Provincial Wildlife Strategy, B.C. Ministry of Environment (October 1989 draft).

∇ Red-listed wildlife species. These are being **considered** by the Wildlife Branch for designation as endangered or threatened in British Columbia.

♦ Blue-listed wildlife species. The Wildlife Branch considers these species "sensitive" and/or deserving of management attention. Population viability is a concern for these species because of (a) major declines in population numbers; or (b) major changes in habitat that will further reduce existing distribution. Species that are generally suspected of being vulnerable, but for which information is too limited to allow designation in another category, are included in this category.

Riparian areas, because of their high vegetative productivity and structural heterogeneity, support a rich diversity of breeding birds and small mammals. In addition, these habitats are often selected by Moose and Mule Deer as calving areas. Wetland meadows and shady draws provide habitat for the Western Terrestrial Garter Snake, Northern Leopard Frog, and Tiger Salamander — species that are poorly adapted to the dry forests that dominate this zone.

Rocky cliffs and talus provide security cover and breeding habitat for Mountain Goat, Yellow-bellied Marmot, Common Pika, Western Rattlesnake, and Townsend's Big-eared Bat.

Agriculture is restricted to lower elevation valleys and riparian areas, sites that often were historically used by ungulates as winter range. Species such as Coyote, Rocky Mountain Elk, Mule Deer, and White-tailed Deer are often considered pests because they sometimes feed on domestic animals or crops. The change in vegetation associated with agriculture benefits some species of wildlife; for example, the Coyote, American Kestrel, Mountain Bluebird, and Lewis' Woodpecker.

RESOURCE VALUES

Forestry is one of several important resource uses in the IDF. Sawlog and pulpwood production are management options for many sites.

The primary agricultural use of the Interior Douglas-fir zone is cattle grazing. The zone provides most of the forested summer ranges for cattle in the province, and also contains spring and fall ranges and wintering areas, particularly in the grasslands. *Calamagrostis rubescens* is the principal forest understory species over much of the IDF. Secondary forage species on forested sites can include *Bromus* spp. (bromegrass), *Carex concinnoides* (northwestern sedge), *Arnica cordifolia*, *Lathyrus ochroleucus* (creamy peavine), and *Vicia* spp. (vetches) (Tisdale 1950; Tisdale and McLean 1957). The principal forage in dry, open forests and grasslands includes *Agropyron spicatum* and *Festuca scabrella* or *F. idahoensis*. *Poa pratensis*, *Stipa occidentalis* (stiff needlegrass), and *Balsamorhiza sagittata* (arrow-leaved balsamroot) can also be important, depending on the ecosystem and grazing history. Browse can be provided by *Amelanchier alnifolia*, *Rosa* spp. (roses), and *Purshia tridentata* (antelope-brush) in some areas. Hay for winter feeding is often produced in the lower parts of the zone.

Fur harvesting is another important resource activity in this zone.

The annual contribution made by the zone to sustained yield watershed flows is fairly limited, although the IDF does contribute significantly to early spring run-off. Significant municipal, domestic, and agricultural water use occurs within the zone.

The IDF is also important for recreation. Many valuable fishing lakes and hunting areas lie within the zone. It is also admirably suited to hiking and horseback riding. Cross-country skiing is a very popular winter activity in the IDF.

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