

DOUGLAS-FIR/DULL OREGON-GRAPE

Pseudotsuga menziesii/Mahonia nervosa

Description

The Douglas-fir/dull Oregon-grape plant community is the typical (zonal) ecosystem of the Moist Maritime subzone of the Coastal Douglas-fir zone (CDFmm).

Historically, this community was widespread across the CDFmm in B.C. Today, mature and old stands have been significantly reduced due to urbanization, agriculture and timber harvesting.

Sites occur on upper to lower slope positions or on level areas. Relative soil moisture regimes range from subxeric to mesic with very poor to medium relative nutrient regimes. Orthic dystric brunisol soils are common, developing on coarse to medium-textured moraines, colluvium or marine deposits.



H. Roemer

Mature forest

These ecosystems are susceptible to invasion from exotic plants species, especially after logging or in areas adjacent to human developments.

Elevations: 0-250 m

Common Vegetation

<i>Trees</i>	Douglas-fir, grand fir, western redcedar
<i>Shrubs</i>	Dull Oregon-grape, oceanspray, salal
<i>Herbs</i>	Bracken fern, sword fern, vanilla-leaf
<i>Mosses</i>	Electrified cat's tail moss, Oregon beaked-moss, step moss

WESTERN HEMLOCK – DOUGLAS-FIR/ELECTRIFIED CAT’S-TAIL MOSS

Tsuga heterophylla – *Pseudotsuga
menziesii*/*Rhytidiadelphus triquetrus*

Description

This historically widespread plant community is the typical (zonal) forest type of the Southern variant of the Dry Submaritime subzone of the Coastal Western Hemlock zone (CWHds1). Extensive logging, urban developments and agricultural activities have made mature and old occurrences of this community rare.

Sites usually occur on middle slopes, but also on upper, lower and level slope positions. Parent material is quite variable but colluvium or



Mature forest

J. Pojar

moraine is typical. Soils have a mesic to submesic relative moisture regime with a medium to very poor nutrient regime. The moderately well to well-drained soils vary from coarse to loamy textures.

Elevations: 0-650 m

Common Vegetation

<i>Trees</i>	Douglas-fir, western hemlock, western redcedar
<i>Shrubs</i>	Black huckleberry, dull Oregon-grape, falsebox, red huckleberry
<i>Herbs</i>	Prince's pine, Queen's cup, sword fern, twinflower
<i>Mosses</i>	Electrified cat's-tail moss, pipecleaner moss, red-stemmed feathermoss, step moss

WESTERN REDCEDAR – DOUGLAS-FIR/VINE MAPLE

Thuja plicata – *Pseudotsuga menziesii*/Acer circinatum

Description

The Western Redcedar – Douglas-fir/ Vine Maple community is a productive, forested ecosystem. Historically, it was widespread across the landscape, with somewhat patchy occurrences.

This community is typically found on lower to level slope positions on fluvial or colluvial deposits, and occasionally on moraine. Deep loamy to sandy soils, with moderate to abundant coarse fragments, are usually moderately well drained.

This community occurs in the southern and central variants of the Dry Submaritime subzone of the Coastal Western Hemlock zone (CWHds1 & CWHds2), in site series 05. Sites are mesic to submesic



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Mature forest

with rich to very rich relative nutrient regimes. Good timber productivity has made this ecosystem a prime candidate for logging, resulting in reduced numbers of mature and old stands remaining on the landbase.

Elevations: 0-650 m

Common Vegetation

<i>Trees</i>	Bigleaf maple (CWHds1), Douglas-fir, paper birch (CWHds2), western redcedar
<i>Shrubs</i>	Vine maple, western hemlock
<i>Herbs</i>	Broad-leaved starflower, clasping twistedstalk, false solomon's-seal, one-leaved foamflower, Queen's cup, spiny wood fern, sword fern
<i>Mosses</i>	Coastal leafy moss, electrified cat's-tail moss, step moss

Appendix I

Conservation Status Ranks and Modifiers

CDC Status Ranks (G = Global, N = National, S = Provincial)	
Ranks	Description
X - Presumed extirpated or extinct	Not located despite intensive searches and no expectation that it will be rediscovered.
H - Historical	Not located in the last 50 years, but some expectation that it may be rediscovered.
1 - Critically imperiled	Especially susceptible to extirpation or extinction. Occurrences: 5 or less.
2 - Imperiled	Very susceptible to extirpation or extinction. Occurrences: 6 to 20.
3 - Vulnerable	Found only in a restricted range (even if abundant at some locations), or susceptible to extirpation or extinction. Occurrences: 21 to 100.
4 - Apparently secure	Uncommon but not rare, and usually widespread in the province. Occurrences: more than 100 existing.
5 - Secure	Common to very common, typically widespread, abundant, and not susceptible to extirpation or extinction under present conditions.
? - Unranked	Rank not yet assessed.
U - Unrankable	Due to current lack of available information.

Modifier	Description
E	Exotic – a species introduced by man to the province.
?	Inexact or uncertain rank due to limited information; qualifies the immediately preceding character.
Q	Taxonomic status is not clear or is in question.
T	A rank for a subspecies or variety.
B	A rank for breeding occurrence of mobile animals.
N	A rank for non-breeding occurrences of mobile animals.
Z	Reported in province as a diffuse, usually moving population.
R	Reported from province, but without persuasive documentation for either accepting or rejecting the report.
RF	Reported in error, but this error has persisted in the literature.

Appendix II

Biogeoclimatic Unit Codes

Code	Zone
AT	Alpine Tundra
CDF	Coastal Douglas-fir
CWH	Coastal Western Hemlock
ESSF	Engelmann Spruce – Subalpine Fir
ICH	Interior Cedar – Hemlock
IDF	Interior Douglas-fir
MH	Mountain Hemlock
SBS	Sub-Boreal Spruce

Code	Subzone
1st letter: precipitation regime	
x	Very dry
d	Dry
m	Moist
w	Wet
v	Very wet
2nd letter: coastal zones (CDF, CWH, MH, AT) - continentality	
h	Hypermaritime
m	Maritime
s	Submaritime
2nd letter: interior zones (ESSF, ICH, IDF, SBS AT) temperature regime	
h	Hot
w	Warm
m	Mild
k	Cool
c	Cold
v	Very cold

1,2,3...= subzone variants reflecting further differences in regional climate. The variant label “p” denotes the parkland variant of a subzone (e.g. MHmmp1 = Mountain Hemlock moist maritime parkland 1 (Windward Parkland Variant)).

Garry Oak Ecosystems

Garry oak ecosystems have a natural occurrence of Garry oak trees, and can range from an open meadow, dense or patchy shrub cover to closed woodland with a mixture of arbutus, Douglas-fir and Garry oak trees. Associated ecosystems may not have Garry oak trees but may still contain many of the same plants and animals. These include vernal pools, grasslands, rock outcrops, transitional forests and maritime meadows. Garry oak and associated ecosystems occur within southeast Vancouver Island, the Gulf Islands and as small remnants in the lower Fraser Valley.

Appendix IV

Stand Structural Stages, Coarse Woody Debris Decay Classes & Wildlife Tree Classes

Stand Structural Stage	Description
1	Sparse/bryoid
2	Herb
3	Shrub/herb
4	Pole/sapling
5	Young forest
6	Mature forest
7	Old forest

Decay classes for coarse woody debris					
	Class 1	Class 2	Class 3	Class 4	Class 5
Wood texture	Intact, hard	Intact, hard to partly decaying	Hard, large pieces, partly decaying	Small, blocky pieces	Many small pieces, soft portions
Portion on ground	Elevated on support points	Elevated but sagging slightly	Sagging near ground, or broken	All of log on ground sinking	All of log on ground, partly sunken
Twigs <3 cm (if originally present)	Present	Absent	Absent	Absent	Absent
Bark	Intact	Intact or partly missing	Trace	Absent	Absent
Shape	Round	Round	Round	Round to oval	Oval
Invading roots	None	None	In sapwood	In heartwood	In heartwood

Classes of Wildlife Trees	
Class	General Description
1	Live/healthy – no decay.
2	Live/unhealthy – internal decay or growth deformities.
3	Dead – hard heartwood, needle and twigs present, roots stable.
4	Dead – hard heartwood, no needles/twigs, 50% of branches lost, loose bark, top usually broken, roots stable.
5	Dead – spongy heartwood, most branches/bark absent, internal decay, roots stable for larger trees, roots of smaller trees beginning to soften.
6	Dead – soft heartwood, no branches or bark, sapwood/heartwood sloughing from upper bole, lateral roots of larger ones softening, smaller ones unstable.
7-8	Dead – soft heartwood, stubs, extensive internal decay, outer shell may be hard, lateral roots completely decomposed, hollow or nearly hollow shells.
9	Debris – downed stubs or stumps.

Appendix V

Species at Risk Ranking

Species	NatureServe (G: Global, N: National, S: Provincial)	COSEWIC	British Columbia
Invertebrates			
Oregon forestsnail	G2 N3N4 S1S2	Endangered	Red
Puget Oregonian snail	G3G4 N2 SX	Extirpated (Nov. 2002)	Red
Johnson's hairstreak	G2G3 N1N2 S1S2	Not determined	IWMS / Red
Quatsino cave amphipod	G2G3 N1N2 S2S3	Not determined	IWMS / Blue
Island large marble	G5T1 SX	Extirpated (May 2000)	Red
Taylor's checkerspot	G5T1 N1 SH	Endangered	Red
Dun skipper	G5 N5 S3	Threatened	Blue
Island blue	G5 NH S1	Endangered	Red

Fish			
Western Brook lamprey	G5T1Q N1 S1	Endangered	Red
Cowichan Lake lamprey	G1 N1 S1	Threatened	Red
Nooksack dace	G3 N1 S1	Endangered	Red
Salish sucker	G1 N1 S1	Endangered	Red
Cultus Lake sculpin	G1 N1 S1	Threatened	Red
Vananda Creek limnetic and benthic sticklebacks	G1 N1 S1	Endangered	IWMS / Red

Amphibians and Reptiles			
Coastal giant salamander	G5 N2 S2	Threatened	IWMS / Red
Coastal tailed frog	G4 N3N4 S3S4	Special concern	IWMS / Blue
Red-legged frog	G4 N3N4 S3S4	Special concern	IWMS / Blue
Oregon spotted frog	G2 N1 S1	Endangered	Red
Sharp-tailed snake	G5 N1 S1	Endangered	Red

Species	NatureServe (G: Global, N: National, S: Provincial)	COSEWIC	British Columbia
Birds			
Ancient murrelet	G4 N3B, N3N S2S3B, S4N	Special concern	IWMS / Blue
Marbled murrelet	G3G4 N3 S2B, S4N	Threatened	IWMS / Red
Cassin's auklet	G4 N4 S2S3B; S4N	Not determined	IWMS / Blue
Sandhill crane	Georgia Depression G5T1Q N? S1 Other populations G5 N5B S3S4B, SZN	Not determined Not at risk	IWMS / Red IWMS / Blue
Great blue heron	G5T4 N? S3B, S5N	Special concern	IWMS / Blue
Lewis's woodpecker	G4 N3B S3B	Special concern	IWMS / Blue
"Queen Charlotte" goshawk	G5T2 N2 S2	Threatened	IWMS / Red
Peregrine falcon	G4T3 N3B, N3N, S2B,SZN	<i>anatum</i> : Threatened <i>pealei</i> : Special concern	Red
"Vancouver Island" whitetailed ptarmigan	G5T3 N3 S3	Not determined	IWMS / Blue
"Vancouver Island" northern pygmy-owl	G5T3Q N3 S3	Not determined	IWMS / Blue
"Queen Charlotte" northern saw-whet owl	G5T3 N3 S3	Not determined	Blue
Short-eared owl	G5 N3N, N5B S3B, S2N	Special concern	Blue
Spotted owl	G3T3 N1 S1	Endangered	IWMS / Red
"Queen Charlotte" hairy woodpecker	G5T3 N3 S3	Not determined	IWMS / Blue
Yellow-breasted chat	G5 N5 S1B, SZN	Endangered	IWMS / Red

Species	NatureServe (G: Global, N: National, S: Provincial)	COSEWIC	British Columbia
Mammals			
"Vancouver Island" common water shrew	G5T2 N2 S2	Not determined	IWMS / Red
Pacific water shrew	G4 N1N2 S1S2	Threatened	IWMS / Red
Keen's long-eared myotis	G2G3 N1N3 S1S3	Special concern	IWMS / Red
Townsend's mole	G5 N1 S1	Threatened	Red
Vancouver Island marmot	G1 N1 S1	Endangered	IWMS / Red
"Queen Charlotte" ermine	G5T2 N2 S2	Threatened	Red
Fisher	G5 N5 S3	Not determined	IWMS / Red
Wolverine	Vancouver Island G4T1 N1 S1 Mainland G4T4 N4 S3	Special concern	IWMS / Red IWMS / Blue
Badger	G5 N4N5 S1	Endangered	Red
Grizzly bear	G4T3T4 N3 S3	Special concern	IWMS / Blue

Species	NatureServe (G: Global, N: National, S: Provincial)	COSEWIC	British Columbia
Mosses, Lichens and Vascular Plants			
Seaside centipede	G2G3 N2N3 S2S3	Endangered	-
Rigid apple moss	G2G4 N1 S1	Endangered	Red
Poor pocket moss	G3? N? S1	Endangered	Red
Phantom orchid	G4 N2 S2	Threatened	Red
Water-plantain buttercup	G5T5 N1 S1	Endangered	Red
Scouler's corydalis	G4 N2 S2	Threatened	IWMS / Red
Prairie lupine	G5 N1 S1	Endangered	Red
Seaside birds-foot trefoil	G5 N2 S1	Endangered	Red
Yellow-montane violet	G5T3T5 N2 S2	Threatened	Red
Purple sanicle	G5 N2 S2	Threatened	Red
Bear's foot sanicle	G5 N2 S1	Endangered	Red
Golden paintbrush	G1 N1 S1	Threatened	Red
Bearded owl-clover	G5T5 N2 S1	Endangered	Red
White-top aster	G3 N2 S2	Threatened	Red
Deltoid balsamroot	G5 N2 S1	Endangered	Red
Tall bugbane	G2 N2 S1	Endangered	IWMS / Red
Tall woolly-heads	G4Q N2 S1	Endangered	Red

Plant Communities			
Douglas-fir/Alaska oniongrass	G? N? S1	Not determined	IWMS / Red
Western hemlock – Douglas-fir/electrified cat's-tail moss	G? N? S2	Not determined	IWMS / Red
Douglas-fir/dull Oregon-grape	G? N? S2	Not determined	IWMS / Red
Western redcedar– Douglas-fir/vine maple	G? N? S1S2	Not determined	IWMS / Red

Appendix VI

Scientific Names (not provided in text)

English name	Scientific name
Invertebrates	
Boisduval's blue	<i>Icaricia icarodides blackmorei</i>
Chalcedon checkerspot	<i>Euphydryas chalcedona</i>
Edith's checkerspot	<i>Euphydryas editha</i>
Northwest hesperian	<i>Vespericola columbianus</i>
Pygmy Oregonian	<i>Cryptomastix germana</i>
Silvery blue	<i>Glaucopsyche lygdamus columbia</i>
Tawny-edged skipper	<i>Polites themistodes</i>
Thicket hairstreak	<i>Callophrys spinetorum</i>
Western spring azure	<i>Celastrina echo</i>

Fish	
Coast range sculpin	<i>Cottus aleuticus</i>
Dolly varden	<i>Salvelinus malma</i>
Longnose dace	<i>Rhinichthys cataractae</i>
Longnose sucker	<i>Catostomus catostomus</i>
Pacific herring	<i>Clupea harengus</i>
Pacific sand lance	<i>Ammodytes hexapterus</i>
Salmon	<i>Oncorhynchus sp.</i>

Amphibians	
Northwestern salamander	<i>Ambystoma gracile</i>
Rocky Mountain tailed frog	<i>Ascaphus montanus</i>

Birds	
Cooper's hawk	<i>Accipiter cooperii</i>
European starling	<i>Sturnus vulgaris</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Rock dove	<i>Columba livia</i>
Rock ptarmigan	<i>Lagopus mutus</i>
Sharp-shinned hawk	<i>Accipiter striatus</i>
Willow ptarmigan	<i>Lagopus lagopus</i>

Mammals	
Beaver	<i>Castor canadensis</i>
Northern flying squirrel	<i>Glaucomys sabrinus</i>
Snowshoe hare	<i>Lepus americanus</i>
Western longeared myotis	<i>Myotis evotis</i>
Woodrat	<i>Neotoma sp.</i>
Wolf	<i>Canis lupus</i>

English name	Scientific name
Mosses, Lichens and Vascular Plants	
Amabilis fir	<i>Abies amabilis</i>
Annual bluegrass	<i>Poa annua</i>
Arbutus	<i>Arbutus menziesii</i>
Arrowleaf balsamroot	<i>Balsamorhiza pusilla</i>
Baneberry	<i>Actaea rubra</i>
Bigleaf maple	<i>Acer macrophyllum</i>
Big-leaved sandwort	<i>Moehringia macrophylla</i>
Bird-foot trefoil	<i>Lotus denticulatus</i>
Black cottonwood	<i>Populus balsamifera</i>
Black huckleberry	<i>Vaccinium membranaceum</i>
Blue wildrye	<i>Elymus glaucus</i>
Bracken fern	<i>Pteridium aquilinum</i>
Broad-leaved starflower	<i>Trientalis borealis latifolia</i>
Broad-leaved shooting star	<i>Dodecatheon hendersonii</i>
Broad-leaved stonecrop	<i>Sedum spatulifolium</i>
Brome	<i>Bromus sp.</i>
Bulrush	<i>Scirpus sp.</i>
Camas	<i>Camassia</i>
Carey's balsamroot	<i>Balsamorhiza careyana</i>
Cattail	<i>Typha latifolia</i>
Chufa flat sedge	<i>Cyperus esculentus</i>
Coastal leafy moss	<i>Plagiomnium insignne</i>
Choke cherry	<i>Prunus virginiana</i>
Columbian hawthorn	<i>Crataegus columbiana</i>
Common apple moss	<i>Bartramia pomiformis</i>
Common California aster	<i>Aster chilensis</i>
Common camas	<i>Camassia quamash</i>
Clasping twistedstalk	<i>Streptopus amplexifolius</i>
Common snowberry	<i>Symphoricarpos albus</i>
Cottonwood	<i>Populus deltoides</i>
Dense-flowered lupine	<i>Lupinus densiflorus var. densiflorus</i>

English name	Scientific name
Mosses, Lichens and Vascular Plants	
Dwarf mistletoe fungal tree parasite	<i>Arceuthobium</i> sp.
Early hairgrass	<i>Aira praecox</i>
Elegant centipede	<i>Heterodermia leucomelos</i>
Engelmann spruce	<i>Picea engelmannii</i>
Fairy-slipper	<i>Calypto bulbosa</i>
Falsebox	<i>Paxistima myrsinites</i>
False Solomon's-seal	<i>Maianthemum racemosum amplexicaule</i>
Fern-leaved desert-parsley	<i>Lomatium dissectum</i>
Field mustard	<i>Brassia campestris</i>
Garry oak	<i>Quercus garryana</i>
Grand fir	<i>Abies grandis</i>
Great camas	<i>Camassia leichtlinii</i>
Hairy honeysuckle	<i>Lonicera hirsuta</i>
Hairy rockcress	<i>Arabis hirsuta</i>
Hardhack	<i>Spiraea douglasii</i>
Harsh paintbrush	<i>Castilleja hispida</i>
Harvest brodiaea	<i>Brodiaea coronaria</i>
Hedgehog dogtail	<i>Cynosurus echinatus</i>
Himalayan blackberry	<i>Rubus discolor</i>
Idaho Fescue	<i>Festuca idahoensis</i>
Indian paintbrush	<i>Castilleja</i> sp.
Indian pipe	<i>Monotropa unifloral</i>
Labrador tea	<i>Ledum groenlandicum</i>
Lodgepole pine	<i>Pinus contorta</i>
Long-stoloned sedge	<i>Carex inops</i>
Lousewort	<i>Pedicularis</i> sp.
Meadow death camas	<i>Zigadenus venenosus</i>
Menzies' larkspur	<i>Delphinium menziesii</i>
Mountain hemlock	<i>Tsuga mertensiana</i>
Oceanspray	<i>Holodiscus discolor</i>
One-leaved foamflower	<i>Tiarella trifoliata</i> var. <i>unifoliata</i>
Orchardgrass	<i>Dactylis glomerata</i>
Oregon beakedmoss	<i>Eurhynchium oreganum</i>

English name	Scientific name
Mosses, Lichens and Vascular Plants	
Oregon grape	<i>Berberis aquifolium</i>
Pacific sanicle	<i>Sanicula crassicaulis</i> var. <i>crassicaulis</i>
Paper birch	<i>Betula papyrifera</i>
Pink corydalis	<i>Corydalis sempervirens</i>
Pink mountain heather	<i>Phyllodoce empetrififormis</i>
Pipecleaner moss	<i>Rhytidiopsis robusta</i>
Plantain	<i>Plantago</i> sp.
Poverty clover	<i>Trifolium depauperatum</i>
Prairie lupine	<i>Lupinus lepidus</i> var. <i>lepidus</i>
Prairie rose	<i>Rosa woodsii</i>
Prince's pine	<i>Chimaphila umbellata</i>
Queen's cup	<i>Clintonia uniflora</i>
Red alder	<i>Alnus rubra</i>
Red fescue	<i>Festuca rubra</i>
Red huckleberry	<i>Vaccinium membranaceum</i>
Red-stemmed feathermoss	<i>Pleurozium schreberi</i>
Ribwort plantain	<i>Plantago lanceolata</i>
Salal	<i>Gaultheria shallon</i>
Salmonberry	<i>Rubus spectabilis</i>
Scotch broom	<i>Cytisus scoparius</i>
Scouler's popcorn flower	<i>Plagiobothrys scouleri</i>
Sea blush	<i>Plectritis congestus</i>
Sedges	<i>Carex</i> sp.
Sierra sanicle	<i>Sanicula graveolens</i>
Sitka spruce	<i>Picea sitchensis</i>
Slender woollyheads	<i>Psilocarphus tenellus</i> var. <i>tenellus</i>
Snowberry	<i>Symphoricarpos albus</i>
Spiny wood fern	<i>Dryopteris expansa</i>
Spring gold	<i>Lomatium utriculatum</i>
Step moss	<i>Hylocomium splendens</i>
Stinging nettle	<i>Urtica dioica</i>
Strawberry	<i>Fragaria</i> sp.
Stream violet	<i>Viola glabella</i>

English name	Scientific name
Mosses, Lichens and Vascular Plants	
Subalpine fir	<i>Abies lasiocarpa</i>
Sweet vernalgrass	<i>Anthoxanthum odoratum</i>
Sword fern	<i>Polystichum munitum</i>
Tall trisetum	<i>Trisetum canescens</i>
Thin-leaved owl-clover	<i>Orthocarpus tenuifolius</i>
Trailing yellow violet	<i>Viola sempervirens</i>
Trembling aspen	<i>Populus tremuloides</i>
Tumble mustard	<i>Sisymbra altissimum</i>
Twinflower	<i>Linnaea borealis</i>
Vanilla-leaf	<i>Achlys triphylla</i>
Water birch	<i>Betula occidentalis</i>
White hyacinth	<i>Triteleia hyacinthina</i>
Western buttercup	<i>Ranunculus occidentalis</i>
Western fescue	<i>Festuca occidentalis</i>
Willow	<i>Salix sp.</i>
Woolly sunflower	<i>Eriophyllum lanatum</i>
Yellow-cedar	<i>Chamaecyparis nootkatensis</i>

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Species at risk web resources

- Birds of the Rocky Mountains: <http://www.lonepinepublishing.com>
- Canadian Wildlife Service: <http://www.speciesatrisk.gc.ca/species/>
- Committee on the Status of Endangered Wildlife in Canada: <http://www.cosewic.gc.ca>
- Canadian Amphibian and Reptile Conservation Network:
<http://www.emanrese.ca/partners/carcnet/tour/glossary/tailfrog/tailfro2.htm>
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http://www.cbif.gc.ca/spp_pages/butterflies/species/DunSkipper_e.php
- Canada's Aquatic Environments: <http://www.aquatic.uoguelph.ca> e Nature:
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Achene: a one-celled, one-seeded dry hard (nut-like) fruit that does not open when ripe.

Aestivation: period in the summer during which animals are in a torpid condition.

Alluvial: pertaining to alluvium.

Alluvium: a deposit of sand and mud formed by flowing water.

Altricial: helpless at hatching and requiring parental care for a period of time.

Amphipod: small (2-50 mm) crustacean common in aquatic ecosystems.

Annual: plant that lives for one year.

Anther: part of male reproductive organ, with filament.

Apically: located or occurring at the apex (highest point).

Arthropods: segmented invertebrates.

Awn: bristle-like appendage.

Basal area: area of the cross section of a tree stem near its base, generally at breast height (1.37 m), above the ground and inclusive of bark.

Benthic: pertaining to or living on the bottom or at the greatest depths of a large body of water.

Biennial: plant that lives for two years.

Blade: expanded, usually flattened, portion of a leaf.

Bract: reduced or specialized leaf often borne below a flower or flower cluster.

Brunisol: normally immature soil commonly found under forested ecosystems. Brunisols are classified (e.g., orthic, dystic, etc.) according to their composition.

Calcar: structure unique to bats – a cartilaginous spur that is attached to the heel bone and extends into the tail membrane.

Calyx: outermost group of floral parts.

Caudal peduncle: narrow part of body between posterior ends of dorsal and anal fins and base of caudal fin.

Canopy closure: degree to which the canopy blocks sunlight.

Capsule: multi-chambered dry fruit that opens at maturity.

Caterpillar: wormlike larva of a butterfly or a moth.

Chernozem: a very black topsoil, rich in humus, typical of cool to temperate semiarid regions.

Chironomid: minute dipterous insects of the family *Chironomidae* resembling a mosquito.

Cingulum: an enamel shelf that lies below the cusp or peak of a tooth; in shrews, the cingulum of the upper unicuspid teeth is on the tongue side of the unicuspid.

Coarse woody debris: sound and rotting logs and stumps that provide habitat for plants, animals and insects, and a source of nutrients for soil development; material generally greater than 7.5 cm in diameter.

Colluvium: Materials that have reached their present positions as a result of direct, gravity-induced movement involving no agent of transportation such as water or ice, although the moving material may have contained water and/or ice.

Cusp: a point.

Dewclaw: a functionless digit; false hoof.

Diameter breast high (dbh): standard diameter measurement for standing tree, including bark, taken at 1.37 m above the ground.

Disk flowers: as part of composite inflorescence, the tubular shaped petals.

Diurnal: active by day.

Dorsal: back of an animal.

Dorsal fin: fin on the back of a fish.

Dystric Brunisol: partially developed, acidic (pH <5.5) soil lacking a thick, dark upper horizon.

Ecosystem: an interacting natural system including all the component organisms together with the abiotic environment.

Echolocation: an orientation system based on generating sounds and listening to their returning echoes to locate objects and prey.

Endemic: native to a particular region.

Entire: in botany, toothless margins.

Euphasids: shrimp-like crustacean found in the zooplankton.

Fjord: long narrow arm of the sea bordered by steep cliffs.

Floodplain: nearly flat plain along the course of a stream that is naturally subject to flooding.

Follicle: a dry fruit derived from a single carpel, splitting open along the ventral suture at maturity.

Fossorial: digging or burrowing.

Fluvial: pertaining to a river.

Fungus: any member of a diverse group of organisms subsisting upon dead or living organic matter, and including mushrooms, molds, mildews, rusts, etc.

Gill rakers: Finger-like portion of gills that extend into the throat; used to trap food.

Glaciofluvial materials: Materials that exhibit clear evidence of having been deposited by glacial meltwater streams either directly in front of, or in contact with, glacier ice.

Glaciolacustrine materials: Lacustrine materials deposited in or along the margins of glacial (ice-dammed) lakes; includes sediments that were released by the melting of floating ice.

Glumes: lowest pair of bracts in a grass spikelet.

Habitat: the sum total of environmental conditions of a specific place occupied by a wildlife species or a population of such species.

Hemiparasite: plant that produces chlorophyll and is capable of photosynthesis but maintains parasitic root connections, with those roots of nearby plants, allowing water and nutrients to be drawn from the host plant.

Hermaphroditic: having both the male and female reproductive organs.

Hibernacula: winter dwelling of an animal (e.g., bats may hibernate in caves).

Hibernation: period in winter during which animals are in a prolonged and controlled state of dormancy.

Inflorescence: a cluster of flowers.

Inlet: an indentation of a shoreline, usually long and narrow.

Karst: an area of limestone formations characterized by sinks, ravines and underground streams.

Keel: longitudinal ridge, as on a leaf or bone.

Kelp: large, brown seaweed.

Krummholz: the stunted and gnarled woodlands characteristic of forest margins at high altitudes and high latitudes. The dwarfing, distortion and, in extreme conditions, prostrate habit of trees are a result of the combined effects of wind and cold.

Lacustrine: pertaining to a lake.

Lateral: side of an animal.

Leaf axis: the main stalk of a compound leaf, where leaflets attach.

Lemma: outer scale of a grass floret.

Ligule: membranous or hairy collar-like appendage at the junction of the blade and the sheath in the grass leaf; also a strap-shaped corolla of a ray flower of *Compositae* (aster family).

Limnetic: of, pertaining to or inhabiting the pelagic region of a body of fresh water.

Medial: in the middle

Morainal: pertaining to moraine.

Moraine: ridge, mound or irregular mass of boulders, gravel, sand and clay left by a glacier.

Mosaic: the intermingling of plant communities and their successional stages in such a manner as to give the impression of an interwoven design.

Mull: a soft, thin woven fabric.

Mustelid: any member of the family *Mustelidae* (i.e., weasel, skunk, badger, marten, fisher, wolverine, etc.)

Mycoparasitic: fungi attacking other fungi.

Mysids: aquatic micro crustacean.

Neotene: amphibian larvae that mature to adult size without losing their external gills. They are sexually mature, obligate waterdwelling individuals.

Niche: the *habitat niche* is the peculiar arrangement of food, cover, and water that meets the requirements of a particular species; the concept of niche is closely associated with the concept of competitive exclusion and competitive relationships among species; niche is also considered the role of an organism within a community.

Nocturnal: active by night.

Occurrence: a location representing a habitat, which sustains or otherwise contributes to the survival of a population.

Oligotrophic: deficient in plant nutrients.

Orthic brunisol: typical, original soil.

Ostracod: minute marine and freshwater crustacean of the subclass *Ostracoda*, with a hinged bivalve shell.

Panicle: branched cluster of flowers, each stalked, blooming from the bottom up.

Papillae: projections on lips of some fish for sensing food.

Parturition: giving birth.

Pelagic: pertaining to water or the open portion of a lake; or pertaining to water of the open portion of an ocean, above the abyssal zone and beyond the upper limits of the littoral zone.

Perennial: plant that lives for longer than two years.

Perigynium: special sac which encloses the achene in sedges; plural, peryginia.

Perlite: volcanic glass.

Petal: one of the segments of the corolla of a flower.

Phytoplankton: the plant organisms in plankton.

Pinna: a leaflet or primary division of a pinnate leaf or frond; plural, pinnae.

Pinnate: compound leaf, with leaflets arranged on two sides of a common axis.

Plankton: aggregate of passively floating or drifting organisms in a body of water.

Post-partum: following birth.

Precocial: active, down-covered, and able to move about freely when hatched.

Pupa: inactive development stage during which an insect larva becomes an adult.

Pupil: expanding and contracting opening in the iris of the eye.

Raceme: an unbranched type of inflorescence presenting a symmetrical display of stalked flowers, with older flowers toward the base.

Ray flowers: as part of composite inflorescence, the strap-shaped petals.

Receptacular bracts: specialized leaf attached to enlarged end of stem.

Rhizome: a rootlike subterranean stem, commonly horizontal in position, which usually produces roots below and sends up shoots from the upper surface.

Roost: perch upon which animals rest.

Rostrum: nasal area or snout of skull.

Saprophytic: living on dead organic matter.

School: large number of fish.

Scute: a large scale.

Sepal: one of the individual leaves or parts of the calyx of a flower.

Sere: the stages that follow one another in an ecologic succession.

Sheath: collar-like outgrowth at a node, or basal part of a leaf wrapped about the stem.

Silt: fine sand or similar material carried by water and deposited as sediment.

Sink habitat: marginal habitat where population mortality exceeds reproduction.

Snag: standing dead or partially dead tree.

Sombric brunisol: partially developed, acidic (pH <5.5) soil with a thick, dark upper horizon.

Sorus: cluster of spore cases, as in the ferns: *plural*, sori.

Species: group of cross-fertilizing individuals with common characteristics.

Species pair: two closely-related but distinct species.

Spike: elongated inflorescence with non-stalked flowers.

Spore: one- or multi-celled structure that gives rise to a new plant in lichens, mosses, hepatics, ferns and allies; plays the role of seeds in higher plants.

Sporangium: a spore case; plural, sporangia.

Spur: hollow appendage on a flower.

Stalk: stem or main axis of a plant.

Stigma: part of the pistil (female organ) that receives the pollen.

Stipule: leaf-like structure at the base of a leaf stalk.

Tadpole: aquatic larva or immature form of amphibians such as frogs, toads, etc.

Taproot: main root descending downward.

Taxum (taxa): group of genetically related organisms classified together as species, genus, etc.

Tephrite: basaltic rock.

Tine: sharp, projecting point or prong.

Tomentose: felt-like structures on plant; often anchors mosses to substrate.

Tragus: thin, cartilaginous structure attached to base of ear.

Tympanum: round eardrum behind the eyes.

Unicuspid: a tooth with one cusp.

Ventral: abdominal of an animal.

Wader: long-legged bird that moves slowly in shallow waters in search of food.

Weaning: time of year when young mammals become accustomed to food other than their mother's milk.

Zooplankton: the animal organisms in plankton.

