

**BCTS SKEENA FIELD GUIDE  
TO  
WILDLIFE MANAGEMENT  
AND  
FOCAL SPECIES  
IDENTIFICATION**



**BCTS Skeena Field Guide to Wildlife Management and Rare Plant Identification**  
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# INTRODUCTION

This book is composed of two parts. The first part summarizes the wildlife management recommendations that were developed for individual species in "Guide to Species of Management Concern in the British Columbia Timber Sales Skeena Business Area – Updated 2017", as well as migratory and nesting birds. These management recommendations, if followed in full, will help mitigate the potential impacts of BCTS forest operations to focal species and ecosystems in the Skeena Business Area. The second part of this book is an identification guide to the rare plant and wildlife species of the BCTS Skeena Business Area.

## CONSERVATION STATUS

The Conservation Data Centre (CDC) in Victoria and the associated NatureServe organization are the primary sources of information on the conservation status of wildlife species (<http://www.env.gov.bc.ca/cdc/>; <http://www.natureserve.org/>).

The Conservation Data Centre is part of the Environmental Stewardship Division in the BC Ministry of Environment. It is also part of NatureServe, a non-profit conservation organization whose mission is to provide the scientific basis for effective conservation action. For details of how conservation rankings are determined, see <http://www.env.gov.bc.ca/wld/documents/ranking.pdf>.

Species of provincial conservation concern are grouped into the "red list" (endangered or threatened) and "blue list" (special concern) lists. The species may not be of national conservation concern, and frequently are not of global conservation concern. However, we have a responsibility to manage for these species, as part of maintaining the biodiversity of British Columbia.

**RED LIST:** Includes any indigenous species, subspecies or ecological community (= "element") that is Extirpated, Endangered, or Threatened in British Columbia.

**BLUE LIST:** Includes any indigenous species, subspecies or community considered to be Vulnerable (= Special Concern) in British Columbia.

**YELLOW LIST:** List of ecological communities and indigenous species that are not at risk in British Columbia, some of which have management requirements.

The provincial Wildlife Act protects almost all vertebrate animals from direct harm, except as allowed by regulation (e.g. hunting or trapping). Legal designation may confer special protection for selected red- and blue-listed species, their residences, or their critical habitat. Legal designation as Endangered or Threatened under the Act increases the penalties for harming a species, and also enables the protection of habitat in a Critical Wildlife Management Area. Such designations do not currently exist (2008). To date (March 2017) there is little actual legal protection for most species at risk or their habitats in British Columbia.

The Conservation Data Centre uses a conservation status ranking system developed by NatureServe. The conservation status ranking codes are summarized in Table 1. Those ranking codes determine whether a species is placed on the red list or blue list, as shown in Table 2.

Table 1. Conservation Status Ranking Codes

S	Subnational level (status in a province, <i>i.e.</i> , British Columbia)
G	Global level (status throughout its global range)
S1/G1	Critically imperilled due to extreme rarity (5 or fewer occurrences)
S2/G2	Imperilled because of rarity (6 to 20 occurrences)
S3/G3	Rare or uncommon (21 to 100 occurrences)
S4/G4	Apparently secure, with many occurrences
S5/G5	Abundant and secure, with many occurrences
SX, SH	Species extinct (X) or only historically (H) occurred in BC.
SR	Reported but without persuasive documentation to either accept or reject the report
SU	Uncertain status, possibly in peril; more information is required
T	Rank for subspecific taxon (subspecies or variety)
Q	Taxonomic problems involved; more information is required
?	Rank tentatively assigned; no information is available or the number of occurrences is estimated

Table 2. Conservation Status Ranks included in Red and Blue List

	Red List	Blue List
Animals	SX, SH, S1, S1S2, S2, S2?, S1S3	S2S3, S3, S3?, S3S4
Plants	SX, SH, S1, S1S2, S2	S2S3, S3
Ecological Communities	SX, SH, S1, S1S2, S2	S2S3, S3

## COMMITTEE ON THE STATUS OF ENDANGERED WILDLIFE IN CANADA (COSEWIC)

COSEWIC determines the national conservation status of all wildlife in Canada. It recommends species to be managed under the Species at Risk Act. The ranking system used by COSEWIC for species at risk is:

- **NAR** (Not at Risk) – the species has been determined to be not of conservation concern.
- **SC** (Special Concern) – species may become threatened or endangered because of biological factors and identified threats.
- **T** (Threatened) – species may become endangered if limiting factors are not reversed.
- **E** (Endangered) – species is facing imminent extinction or extirpation.
- **DD** (Data Deficient) – species that lack sufficient data to determine a conservation status.

There are also other ranks, but they are not relevant to the species in this guide.

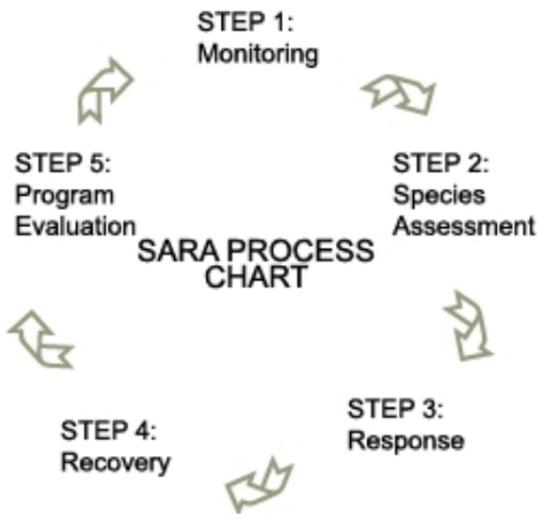
## SARA – SPECIES AT RISK ACT (2003)

The purposes of the SARA are to prevent Canadian indigenous species, subspecies, and distinct populations from becoming extirpated or extinct, to provide for the recovery of endangered or threatened species, and encourage the management of other species to prevent them from becoming at risk. See [www.sararegistry.gc.ca](http://www.sararegistry.gc.ca).

SARA is the legislation that specifies the national legal conservation status of all wildlife in Canada. COSEWIC recommends a conservation status for a species to a federal Minister who then accepts, rejects, or changes the recommendation. Once the Minister has determined a conservation status, the species becomes part of Schedule 1 of the Species at Risk Act (SARA). The ranking system is the same as is used by COSEWIC. SARA has three "Schedules", of which two are relevant to BCTS Skeena:

**Schedule 1:** Lists all the species that legally fall under SARA; most BCTS-Skeena SARA species are on this Schedule.

**Schedule 3:** Lists all the species that COSEWIC listed as Special Concern when SARA came into force, but for which the COSEWIC status report was inadequate; two birds and two plants in the BCTS-Skeena area are on this Schedule. Schedule 3 species may still be rejected for inclusion under SARA, once modern status reports are completed, and so do not have full status under SARA.



[http://www.sararegistry.gc.ca/background/process\\_e.cfm](http://www.sararegistry.gc.ca/background/process_e.cfm)

Listing of a species under SARA confers protection of the species and its habitat *only* if the species is on federally owned land (national parks, military reserves, Indian Reserves) or is a migratory bird under the *Migratory Birds Convention Act* or is a fish managed under the *Fisheries Act*. All other species fall under provincial jurisdiction, and the province has chosen to provide very little protection for species at risk to this time.

# WILDLIFE HABITAT MANAGEMENT

The report *Guide to Species of Management Concern in the British Columbia Timber Sales Skeena Business Area* (Updated 2017) reviewed 94 species and ecosystems of potential management concern, and also reviewed wildlife habitat features that are important to several species. Risk assessments were conducted for each of the 94 species and ecosystems, based on 25 different forestry activities.

Many species were not considered management concerns for BCTS, because interactions between forest operations and the wildlife species were very unlikely. Management recommendations were developed for all focal species and ecosystems. The management recommendations for each individual species have been consolidated in this Field Guide as management strategies. The species that are addressed by each set of management strategies are noted at the start of each section. These Field Guide management recommendations, **if followed in full**, should adequately mitigate the potential impacts of BCTS forest operations to wildlife species of management concern, including species at risk.

## STREAMS

Bull Trout	American Black Bear
Eulachon	Kermode Black Bear
Other Game Fish	Grizzly Bear

- Wherever possible, use bridges for fish stream crossings; if an open-bottom arch or an embedded culvert is used, ensure that the width is considerably wider than the stream channel to minimize the risk of streambed instability, beaver plugging, debris jams, bedload deposition, or current velocity issues.
- Consider having a trained Environmental Monitor develop an Environmental Management Plan and monitor the on-site work for installation or removal of all fish stream crossing structures.
- Wherever possible remove pre-FPC culverts from fish streams.
- Apply the FPC *Fish Stream Crossing Guidebook* when constructing road crossings of all fish streams; ensure that all crossing structures in fish streams are “fish friendly”.
- Minimize the risk of changes in stream water quality and flow patterns, especially small streams.
- Maintain the quality and flow patterns of surface water flowing into streams, when harvesting and or constructing roads.
- Gravel the surface of road approaches to all stream crossings and armour all ditches that empty into streams.
- Avoid broadcast herbicide applications within the entire Riparian Management Area, to maintain a healthy shrub layer (spot applications are acceptable).
- For S4 streams with moderate to high quality fish habitat, ensure retention of a high proportion of the existing trees and shrubs. This will minimize changes in water temperature, shade, sediment, flow patterns, and food and nutrient inputs; this may require further tree retention to reduce windthrow risk adjacent to the streams.
- For S4 streams with marginal fish habitat, and S5 and S6 streams and NCDs that flow directly into moderate to high quality fish habitat, maintain high shrub and residual tree retention in the Riparian Management Area (within a 10 m width for NCDs), to maintain water quality (temperature, sediment, flow patterns). If abundant shrubs and residual trees are not present, retention of mature trees may be required to prevent harmful alteration, disruption, or destruction of fish habitat.

## STREAMS (CONT'D)

Manage both Bull Trout concentration sites that are not WHAs by:

- Determine the location of concentration sites by annually requesting the information from Regional FLNRO.
- Minimize bladed structures near the stream or immediate tributaries.
- Retain sufficient windfirm streamside trees to contribute a long-term supply of large woody debris, and to meet the fish habitat requirements discussed above for S4 streams. Design tree retention to minimize the windthrow risk along the stream banks; one option is to use wider patches rather than a thin continuous strip.
- Minimize public access to concentration sites, by not building permanent roads within 500 m and by promptly deactivating temporary roads within 500 m.
- Manage the rate and temporal pattern of harvest so as to maintain the hydrologic stability and water quality of S1, S2, S3 and S5 stream watersheds (this is a landscape level issue that may need to be coordinated with government and other forest licensees, especially for the larger streams).



Dolly Varden or Bull Trout - Iskut River tributary (Photo: C. Guppy)

## FISHERIES SENSITIVE FEATURES

A fisheries sensitive feature (FSF) is:

- a) the seasonally flooded (littoral) zone of a lake; or
- b) a flooded depression, pond or swamp that is not a stream, wetland or lake, that either perennially or seasonally contains water, and is seasonally occupied by a species of fish referred to in the FRPA definition of a fish stream.

Management of these areas must ensure consistency with the federal *Fisheries Act* Section 35, *i.e.* harvesting and other operations must not result in "serious harm to fish". Serious harm to fish is defined as "the death of fish or any permanent alteration to, or destruction of, fish habitat". A 15-30 m no-development strip along a fish bearing feature is generally sufficient to mitigate the direct impact of development activities on fish habitat, with the wider widths needed for higher intensity/impact developments. To prevent or mitigate potential BCTS operational impacts on a fisheries sensitive feature:

- If operating over 30 m from a fisheries sensitive feature, implement the following mitigation measures:
  - Do not allow water contaminated by sediment, petroleum products, or chemicals to enter the feature from ditches, non-classified drainages, and overland flow from harvested areas or bladed access structures, or streams.
  - Minimize the risk of windthrow in unharvested areas near the feature.
  - Maintain natural surface and subsurface water flows into and out of the feature; ensure that road cuts do not disrupt subsurface flow patterns - the water temperature and volume of the feature may be dependent on such flows.
- If operating 15-30 m from a fisheries sensitive feature, implement additional mitigation measures:
  - Where possible, do not build permanent roads; if a permanent road needs to be constructed consult with a qualified fish habitat biologist and/or DFO to prevent serious harm to fish from occurring.
  - Minimize the construction of temporary roads and other bladed structures.
  - Retain natural shrubs and herbaceous vegetation as much as possible; if possible, retain 30+% of the trees; fall and yard away.
  - After harvesting, re-contour temporary roads and other bladed structures; apply an appropriate seed mix and plant with trees. Control sediment production until revegetation is complete.
  - If possible, avoid soil-disturbing site preparation (other than hand screening) prior to planting; this is to minimize the risk of sediment entering the FSF and to maintain the natural herbaceous and shrub plant species.
- If operating within 0-15 m of a fisheries sensitive feature, implement additional mitigation measures:
  - Time operations so as to minimize potential effects on fisheries sensitive features (*i.e.*, during the dry season).
  - Preferably prescribe partial cutting; maintain a 5-m machine-free zone to minimize the risk of damage to banks or soil disturbance that will produce sediment.
  - Obtain the advice of a qualified Professional as to whether serious harm to fish may occur through the proposed operations.

## WET MEADOWS, WETLANDS, AND PONDS

Western Toad American Black Bear Kermode Black Bear Grizzly Bear	Wildlife Habitat Feature - non-classified wetland or ephemeral pond associated with a species at risk
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- In lower elevation BECs (ICH, CWH, SBS) preserve, as much as possible, small permanent and ephemeral wetlands, ponds, and streams - these small areas can be very important for amphibians and many species at risk (including ecological communities). An ephemeral water feature is filled with spring melt water or seasonal rains and is typically dry by mid-summer.
- Where possible, manage shallow water and wetland areas as amphibian habitat<sup>1</sup>.
- Priority 1: wet area > 500 m<sup>2</sup>; with open water in spring not covered by shrubs.
- Priority 2: wet area > 500 m<sup>2</sup>; with little open water in spring (mostly shrubs);
- OR wet area 100-500 m<sup>2</sup>; and less than 40% overhead canopy and >20-50% emergent herb cover, and < 10% woody debris cover. Priority 3: other small wet areas.
- Avoid altering natural patterns of flooding and drying of wetlands; avoid directing sediment laden ditch water into ponds and wetlands.
- Maintain existing downed logs and chunks of bark, especially large pieces, near these aquatic features; downed wood provides important shelter.
- Retain snags and large stumps adjacent to wetlands and open water, to act as perches for songbirds and raptors
- Avoid constructing permanent roads near ponds, wetlands, and wet meadows, to minimize road mortality and disturbance.
- Avoid using herbicides near ponds/wetlands - surfactants in herbicides adversely affect the "breathability" of amphibian skins. If herbicides must be applied, hotter and drier conditions are better so that the adults are more likely to be under cover.
- "Near" is within 30-50 m, depending on the size of the pond or wetland; where possible the distance should be increased.
- At all elevations protect wet meadows ("grassy" wet areas dominated by sedges or grasses, and frequently a wide range of other herbaceous plants) from disturbance (to bears and ungulates), by providing a forested buffer of natural vegetation for visual screening, and keeping roads as far back as possible.
- Inventory for red-listed plant and animal species at risk associated with wetland/pond features, if such species are known to occur within 2 km. Alternatively, assume that they are present without doing any inventory.
- If species at risk are know/assumed present, manage features as recommended for specific red-listed or blue-listed ecological communities or species.

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<sup>1</sup> Priorities based on the Amphibian Field Card developed for southern Vancouver Island. The applicability to the Skeena has not been tested, but the recommendations are reasonable in the context of amphibian biology. [http://www.forrex.org/publications/jem/ISS47/vol9\\_no1\\_art5.pdf](http://www.forrex.org/publications/jem/ISS47/vol9_no1_art5.pdf).

## HOT SPRING OR THERMAL SPRING

A hot spring or thermal spring is a source of water that is heated geothermally and comes to the surface. There is no minimum temperature for this heated water, but it is usually above 5°C and the temperature is constant throughout the year.

Thermal springs frequently support rare ecosystems and rare species; but the Conservation Data Centre does not presently identify and list most of them (most species have not been assigned a conservation status). Thermal spring species are usually small and obscure; rare species are in groups such as plants, fungi, insects, spiders, snails, and sometimes fish. The rare Hudson Bay club-rush / rusty hook-moss ecological community may be associated with some thermal springs.

Thermal springs have a near-constant water temperature; that water temperature may be very low or as high as boiling. One definition states that a thermal spring has a temperature above the mean annual air temperature; since the mean air temperature in Terrace is 6.3° C (Environment Canada) the difference in definitions will seldom be relevant. The constant, usually relatively warm, water temperature provides the opportunity for warm climate aquatic species to live abnormally far north, and for specialist species to evolve. Cool thermal springs may only be identified as such in the winter, when the water is noticed as having remained warmer than near-zero snow melt water - the temperature of thermal springs results from deep geological temperatures, it is not correlated with surface water temperatures resulting from rain or snow.

Thermal springs are frequently mineral-rich, and hence may be associated with mineral licks. They are also frequently associated with outcrops of calcium-rich tufa. Tufa is a soft, porous calcium carbonate rock deposit formed by precipitation from water with a high dissolved calcium content. Many calcium-dependent herbaceous plants are associated with tufa; hence tufa deposits around thermal springs should be protected as well as the springs themselves. The tufa deposits result in poor ground drainage; hence wallows may be present.

- Determine whether there is high wildlife use of the spring - indicated by mineral licks, wallows, and major trails focussed on the spring.
- If mineral licks and/or wallows are present manage for those features.
- Manage the spring using the same strategy as for a fisheries sensitive feature, in recognition that there are likely to be undocumented rare species and ecosystems present.

## WALLOW

American Black Bear	Mountain Goat
Kermode Black Bear	Hudson Bay club-rush/rusty hook-moss
Moose	ecological community

A wallow is a shallow depression or pit in the ground created by ungulates (moose, mountain goat) or grizzly bear through regular digging, trampling or rolling, or an existing wet depression regularly used by ungulates or grizzly bears to wallow. A wallow is typically used regularly and repeatedly (at least annually) by one or more species.

- Maintain 200 m of unroaded mature forest cover adjacent to wallows, plus 100 m on either side of associated major trails, to provide security and thermal cover.
- Deactivate all roads within 500 m.
- Do not build permanent roads within 1000 m of wallows.
- Do not build permanent roads across associated major trails, to minimize disturbance and vehicle mortality.
- Locate roads and design cutblocks to prevent direct lines of sight onto wallows.
- Avoid mechanized activity within 500 m during the summer high use period.
- Maintain a helicopter no-fly zone within 2 km of wallows and associated trails during the summer high use period.

Factors such as existing permanent roads or topographic features may allow reductions in the distances given above that will not significantly increase the level of disturbance or reduce usable security or thermal cover. Topography may also make it impossible or unreasonable to place roads or cutblock boundaries as far away from a wallow as desirable.

## MINERAL LICK

Moose  
Mountain Goat  
Mule Deer

Sitka Black-tail Deer  
White-tail Deer

A mineral lick is a natural area used on a habitual basis by ungulates to obtain dietary such as manganese, copper and selenium, that is (a) regionally rare on the landscape; or (b) used regularly and annually by more than one species; or (c) used by a large proportion of individuals within a population. Mineral licks created by road construction should not be managed for, because of the risk of wildlife collisions with vehicles.

- Maintain 200 m of unroaded mature forest cover adjacent to mineral licks (100 m on either side of associated major trails) to provide security cover, thermal cover and snow interception.
- Deactivate/unbuild all roads within 500 m, where feasible.
- Do not build permanent roads within 1000 m of mineral licks, where feasible.
- Do not build permanent roads across associated major trails, to minimize disturbance and vehicle mortality.
- Locate roads and design cutblocks to prevent direct lines of sight onto mineral licks.
- Avoid mechanized activity place within 500 m during the summer high use period.
- Maintain a helicopter no-fly zone within 2 km of mineral licks and associated trails during the summer high use period.

Factors such as existing permanent roads or topographic features may allow reductions in the distances given above that will not significantly increase the level of disturbance or reduce usable security cover, thermal cover, or snow interception forest. Topography may also make it impossible or unreasonable to place roads or cutblock boundaries as far away from a mineral lick as desirable, or to avoid crossing major trails.

## CLIFFS, CAVES, TALUS SLOPES, AND SCREE SLOPES

Little Brown Myotis  
Mountain Goat  
Wolverine

Peregrine Falcon  
Habitat Features - Cliffs, Caves, Talus  
Slopes, and Scree Slopes

- A cliff is a significant vertical, or near vertical, rock exposure. A cave is a naturally formed subterranean chamber, generally formed by dissolving of carbonate bedrock by water, or in basalt flows as lava tubes. A talus slope is usually steep, 45 degrees or more, composed of rocky boulders that accumulate at the foot of a cliff, typically by the weathering process of frost-wedging. A scree slope is usually over 30 degrees and composed of small rocks and gravel that have broken away from the cliffs above.
- As a default measure, avoid road construction within 500 m of a cliff if possible. Where road construction or harvesting is required adjacent to cliffs, maintain a vegetated buffer to minimize potential for disturbance of peregrine falcons.
- Otherwise, inventory karst cliff areas for caves that might be used as hibernacula by Little Brown Myotis and other bats. Caves >100 m in length and above 500 m elevation are known to be important winter hibernation sites; however, lower elevations may be used in the relative northern BCTS Skeena area. Given the lack of existing inventory, this is the only way to provide for effective management of Little Brown Myotis.
- Protect known bat and myotis hibernation sites from disturbance (see Keen's Long-eared Myotis Identified Wildlife Management Strategy for methods).
- Inventory a talus or scree slope for rare plants prior to deciding to mine it; minimize the proportion of the surface of the slope that is disturbed.

## OLD AND ANTIQUE FOREST

Little Brown Myotis	Marbled Murrelet
Fisher	Olive-sided Flycatcher
American Marten	Western Screech-owl
Grizzly Bear	Cryptic Paw
Black Bear	Mountain Moonwort
Kermode Black Bear	Oldgrowth Specklebelly

- Maintain connectivity of mature and old forest between riparian and upland habitats, and elsewhere on the landscape. This may require multi-party cooperation.
- Retain old forest patches that have high structural complexity including high amounts of CWD, through designation as WTPs, OGMAs, or temporary deferred harvest areas. This may require multi-party cooperation.
- Address loss of potential bear den cavities in large, old trees through “enhanced wildlife tree patches”, which are at least 1 hectare in size and contain standing live trees > 1m diameter and > 5 m height. Otherwise,
- Leave large structured downed wood (piles) on cutblocks to provide additional opportunities for denning habitat, preferably within 30 m of mature forest.
- Applying variable retention harvesting may also address issues around the need for structure within managed stands, as long as suitable large trees are retained in areas of harvest. Retention patches should be “anchored” at existing bear dens, if they are present.
- Assess the habitat suitability of proposed harvest areas within the range of potential habitat of Marbled Murrelets, as mapped and discussed in Identified Wildlife (2004). Establish block boundaries, harvest prescriptions, wildlife tree patches, and, if possible, OGMAs to maintain habitat suitability habitat of as much forest as possible (see Identified Wildlife 2004 for details). Particular preference should be given to trees with large, moss-covered limbs.
- When harvesting is considered near a known Marbled Murrelet nest site that is not a WHA, provide a draft WHA boundary around it and manage per the Identified Wildlife Management Strategy for a WHA.
- Maintain a high component of antique forest as old growth management areas. Antique forests are very old growth forests, far beyond the minimum age definition of “old growth”. This may require multi-party cooperation.
- Plan for the maturation of some old growth forest into antique forest, to replace the inevitable loss of some antique forest over time. This may require multi-party cooperation.
- Harvest patch size distribution should be as recommended by the Biodiversity Guidebook. This may require multi-party cooperation.

## WILDLIFE TREES AND SNAGS

Birds	Wildlife Tree Value	Mammals	Wildlife Tree Value
Bald Eagle	Stick nests, perches	Keen's Long-eared Myotis	Maternity and day roosts under loose bark
Osprey		California Myotis	
Heron		Little Brown Myotis	
Western Screech-owl	Cavity nests, foraging	Silver-haired Bat	
Olive-sided Flycatcher	Foraging perches	Black Bear	Winter sleep sites in hollow trunks
Marbled Murrelet	Nests in old branches	Fisher Marten	Dens in hollow trunks

A wildlife tree is a standing dead or living tree with special characteristics (Table 4) that provide critical habitat for the conservation or enhancement of wildlife. The BCTS Skeena BMPs for Stand Level Retention provide general guidance on design of cut blocks to maintain habitat carrying capacity and conserve connectivity (BCTS Skeena 2012). The BMP document can be found here:

<https://www.for.gov.bc.ca/ftp/TSK/external/!publish/EMS2/Supplements/BMP-Stand-Level-Retention-TSK.pdf>

**Table 3. Wildlife Tree Characteristics**

Wildlife Tree Value	Characteristics
High	<p>Two or more of the following characteristics present:</p> <ul style="list-style-type: none"> <li>• Internal decay (heart rot)</li> <li>• Broken top / "chimney cavity"</li> <li>• Natural/excavated cavities</li> <li>• A sound, firm trunk shell</li> <li>• Crevices present (loose bark or cracks suitable for bats)</li> <li>• Large brooms</li> <li>• Active or recent wildlife use (feeding, nesting, denning)</li> <li>• Tree structure suitable for wildlife use – large nest, hunting perch sites, bear den, etc.</li> <li>• Largest trees for site (height and/or diameter) and veteran trees</li> <li>• Locally important wildlife tree species (cottonwood, aspen, western redcedar, whitebark pine)</li> <li>• Favourably located for use by wildlife</li> </ul>
Medium	Large, stable trees likely to develop two or more above characteristics
Low	Trees not covered by the high or medium categories

## WILDLIFE TREES AND SNAGS (CONT'D)

- During design and distribution of Wildlife Tree Patches (WTP), prioritize the retention of high-value wildlife trees.
- Where possible, utilize a variety of wildlife tree retention strategies, including large patches in combination with dispersed retention.
- Inter-patch spacing should not generally exceed 500 m.
- Pay particular attention to retention of medium to large diameter trees:
  - that have loose bark or will likely develop loose bark in the future, and/or
  - that are mature, old, and decadent aspen, cottonwood, spruce, and redcedar, and/or
  - that are adjacent to water features of all sizes (wetlands, ponds, lakes and streams).
- Other attributes that should be targeted for inclusion in retention areas include:
  - aboriginal forest resources
  - habitat for species of risk
  - ungulate winter range
  - red- and blue-listed ecosystems
  - riparian forest
  - future coarse woody debris
- Include groups of moderate value wildlife trees in wildlife tree patches and other retention areas, wherever possible.
- The range of species, sizes and decay classes representative of the ecosystem should be maintained.
- When salvaging windthrown, insect damaged, or fire damaged trees, include some damaged but standing trees in retention areas.
- Where possible, preference should be given to the retention of snags with greater diameter and height
- The standard target for Wildlife Tree Patch retention under the provincial Forest Planning and Practices Regulation (FPPR) is 7% of all cutblock area harvested by a given licensee in a one-year period (April 1 to March 31), and a minimum of 3.5% of the area of any single cutblock. Targets vary among different Forest Development Units (FDU).
  - In the Cranberry FDU, targets are 3.5% per block and 12% of the licensee's area.
  - In the North Coast FDU, the target is 15% of each block
  - In the Nass FDU, targets are in line with the FPPR standard
  - Targets for the Kalum South, Kispiox and West Babine FDUs are described in Tables 4 through 7.

## WILDLIFE TREES AND SNAGS (CONT'D)

Table 4. WTP Retention Targets (ILMB 2006)

Landscape Unit	BEC Subzone	WTP Retention Target (%)
<b>Kalum South FDU</b>		
Nass River (K'alii Aksim Lisims)	ICHmc	7
Skeena River	CWHvm	5
	CWHws	5
	ICHmc	4
	MHmm	0
Beaver	CWHws	8
	MHmm	0.5
Clore	CWHws	6
	ESSFmk	3
	ESSFwv	1
	MHmm	3
Exstew	CWHws	6
	MHmm	3
Hawkesbury Island West	CWHvh	0
	MHwh	0
Hirsch	CWHvm	5
	CWHws	11
	MHmm	0
Ishkheenickh (Ksi Hlingx)	CWHvm	2
	CWHws	2
	MHmm	0
Kalum	CWHws	10
	MHmm	5
Kasiks	CWHvm	0
	MHmm	0
Kemano	CWHvm	0
	CWHws	1
	ESSFmk	0
	MHmm	0
Lakelse	CWHws	7
	MHmm	0
Tseax (Ksi Sii Aks)	CWHws	4
	ICHmc	8
	MHmm	0
Wedeeene	CWHvm	3
	CWHvh	2
	CWHws	10
	MHmm	3

## WILDLIFE TREES AND SNAGS (CONT'D)

Table 5. WTP Retention Targets (cont'd) (ILMB 2006, BCTS 2016)

Landscape Unit	BEC Subzone	WTP Retention Target (%)
<b>Kalum South FDU</b>		
Dala	CWHvm	3
	CWHws	0.5
	MHmm	0
Dasque	CWHws	7
	MHmm	0
Exchamsiks	CWHvm	0
	MHmm	0
Falls	CWHvm	1
	MHmm	0
Hawkesbury Island East	CWHvh	1
	MHwh	0
Horetzky	CWHws	2
	MHmm	0
Hot Springs	CWHws	7
	MHmm	0.5
Jesse Bish	CWHvm	1
	MHmm	0
Kiteen (Ksi Gahl't'in)	CWHws	3
	ESSFwv	1
	ICHmc	7
	MHmm	1
Kitimat	CWHvm	5
	CWHws	7
	MHmm	0
Kleanza Treasure	CWHws	7
	ICHmc	6
	MHmm	2
Ksedin (Ksi Mat'in)	CWHws	6
	MHmm	0
Nelson Fiddler	CWHws	8
	ICHmc	5
	MHmm	2
<b>Kispiox FDU</b>		
Babine	ESSFmc	3
	ESSFwv	0.5
	ICHmc	3
	SBSmc	1
Kispiox North	ESSFwv	0
	ICHmc	1
Kispiox South	ESSFwv	2
	ICHmc	6

## WILDLIFE TREES AND SNAGS (CONT'D)

Table 6. WTP Retention Targets (cont'd) (BCTS 2016)

Landscape Unit	BEC Subzone	WTP Retention Target (%)
<b>Kispiox FDU</b>		
Upper Skeena	ESSFwv	0.5
	ICHmc	1
	SBSmc	2
Middle Skeena North	ESSFwv	0.5
	ICHmc	3
Middle Skeena South	CWHws	8
	ESSFwv	2
	ICHmc	3
Lower Skeena	MHmm	0
	ICHmc	4
	CWHws	0.5
	ESSFwv	0.5
Suskwa	ESSFwv	0.5
	ICHmc	4
Gitsegukla	CWHws	4
	ICHmc	3

Table 7. WTP Retention Targets in West Babine FDU (MSRM 2004)

Watershed	BEC Subzone	WTP Retention Target (%)	
		Blocks $\leq$ 80 ha	Blocks >80 ha
Shelagyote	ESSFmc	4	6-8
	ESSFwv	1	1.5-2
	SBSmc	1	1.5-2
Babine River	ESSFmc	7	10.5-14
	ESSFwv	4	6-8
	ICHmc	1	1.5-2
	SBSmc	3	4.5-6
Gail-Thomlinson	ESSFmc	5	7.5-10
	ESSFwv	1	1.5-2
	SBSmc	3	4.5-6
Nichyeska	ESSFmc	5	7.5-10
	ESSFwv	4	6-8
	SBSmc	3	4.5-6
Shedin	ESSFwv	1	1.5-2
	ICHmc	4	6-8
Hanawald	ESSFmc	7	10.5-14
	ICHmc	3	4.5-6
	SBSmc	5	7.5-10

## WILDLIFE TREES AND SNAGS (CONT'D)

Minimum structural objectives for mature stands are outlined by biogeoclimatic zone in Table 8. Recommended snag composition includes all dead trees and any live trees in significant decline (decay class 2 or greater, under the Wildlife Tree Classification system).

**Table 8. Minimum structural objectives for mature stands by biogeoclimatic zone. Values in brackets are averages for "zonal" sites (Steventon 1994).**

Component	CWH	ICH	MH	ESSF	SBSmc	SBSdk/ SBPS
<b>Snags/ha</b>						
>17.5 cm dbh	5 (23)	5 (53)	5	10 (121)	9 (99)	6 (67)
>27.5	2 (11)	2 (13)	3	8 (84)	3 (24)	3 (12)
>37.5	3 (13)	3 (25)	2	4 (40)	2 (11)	1 (2)
Total	10 (47)	10 (91)	10	22 (245)	14 (134)	10 (81)
<b>Stems/ha</b>						
>17.5 cm dbh	300 (337)	400 (689)	400	400 (887)	400 (798)	400 (805)
>37.5 dbh	30 (144)	20 (175)	15	15 (145)	15 (83)	10 (37)

Considerations for applying recommended retention targets include the current and projected forest condition and development patterns. Table 9 provides a general framework for such application of such considerations.

**Table 9. Stand Level Retention Targets and Considerations (BCTS Skeena 2012).**

Low Stand Level Retention % may be suitable if:	<ul style="list-style-type: none"> <li>• The landscape is of limited operability for timber development (due to e.g. Parks / Protected Areas or terrain attributes) and / or,</li> <li>• limited timber development has occurred and the landscape has a high level of intact natural forest.</li> <li>• The cutblock area is small e.g. &lt; 1 ha.</li> <li>• At the stand level, significant biological anchors are few or are widely scattered.</li> <li>• Timber production is a high priority management objective.</li> </ul>
Moderate Stand Level Retention % may be suitable if:	<ul style="list-style-type: none"> <li>• The landscape currently has, or is expected to have, a moderate amount of intact natural forest over time.</li> <li>• At the stand level, significant biological anchors are present.</li> </ul>
High Stand Level Retention % may be suitable if:	<ul style="list-style-type: none"> <li>• The landscape is highly operable for timber development and / or,</li> <li>• Significant timber development has occurred in the landscape with low levels of stand level retention.</li> <li>• At the stand level, there are an unusually high or diverse number of biological anchors.</li> <li>• Management objectives for wildlife or other non-timber objectives are a priority.</li> <li>• The cutblock area is large (e.g. &gt; 100 ha). Favor large group retention patches in a context of large cut blocks or limited intact natural forest in the landscape.</li> </ul>

## STICK NESTS AND CAVITY NESTS

- Stick nests and cavity nests are considered enduring nests that can be used over many years by multiple bird species.
- Layout personnel should be familiar with the characteristics of stick nests and cavity nests, and should note them during layout.
- Wherever possible, record any stick nests or cavity nests identified during layout with GPS coordinates, and retain them during development.
- Cavity nests are most commonly found in trees with heart rot, but can be excavated in solid trunks of healthy, young trees as well. Deciduous trees such as cottonwood and aspen are particularly valuable for nesting cavities.



Figure 1. Potential nesting cavities excavated in young aspen.

## STICK NESTS AND CAVITY NESTS (CONT'D)

- Many raptor species nest in relatively large stick nests, situated well off the ground in the crooks of large limbs or broken tree tops.
- Some nests, such as osprey and eagle nests, are very large and conspicuous.
- Others can be much smaller and difficult to identify.
- Evidence of stick nests may be found around the base of nest trees, where molted feathers, pellets, bones of prey and whitewash may be found.
- Check any known nest sites prior to harvesting activities.
- If the nest is active, establish a buffer to minimize potential for nest disturbance.



Figure 2. Northern goshawk nest situated approximately 12 m above ground.

- Avoid harvesting near known nests of Western Screech-owls; buffer with a wildlife tree patch. During the nesting season (April to August), do not operate heavy machinery near enough to disturb the birds (the specific distance depends on topography, forest type, etc. but default to 500 meters).
- Locate new roads away from known nest sites.
- Retain large diameter stubs (as tall as possible) in harvest areas.

## STICK NESTS AND CAVITY NESTS (CONT'D)

- Preserve all trees that have Bald Eagle, Osprey or Great Blue Heron nests (it is contrary to the Wildlife Act to harm such nests), including presently unoccupied trees that have been used in the past.
- Maintain a 300 m no-harvest and no-road reserve around eagle/osprey/heron nest trees; maintain an additional 200 m free of loud noises and other human disturbances around occupied nests in the period February through August.
- Maintain any trees that eagles/ospreys/herons regularly use for roosting, perching or feeding.
- Locate new roads away from eagle/osprey/heron nesting, roosting and foraging areas.



Figure 3. Great blue heron nest in shallow water wetland (C. Guppy)

- Avoid the use of chemical pesticides near eagle/osprey/heron nests.
- Maintain existing and potential sites for large stick nests (large, stable veteran trees), especially those within 200 m of a marine or lake shoreline, or a S1 or S2 river, to serve as eagle/osprey/heron nest sites and perching sites.
- When harvesting is considered in the vicinity (within 500 m) of a known Great Blue Heron nest site, provide a draft WHA boundary around it (or establish a WTP) and manage per the Identified Wildlife (2004) strategy for a WHA.

## MIGRATORY AND NESTING BIRD HABITAT

In addition to enduring nests such as stick nests and cavity nests, a variety of habitat features are considered important to supporting migratory and nesting birds. Under the provincial Wildlife Act, the destruction of birds, eggs and occupied nests is prohibited. Furthermore, the federal Migratory Birds Regulations prohibit the disturbance, destruction or taking of the nests or eggs of migratory birds. Environment Canada has developed Avoidance Guidelines to minimize potential for incidental take during clearing and vegetation removal, including the establishment of nesting zones and approximate timing windows for nesting migratory birds. In addition, Beneficial Management Practices have been developed to guide management of nesting migratory birds within the forestry sector. While following these and other guidelines can minimize risk of incidental take, they do not guarantee avoidance of active nests and compliance with the legislation.

- During planning, determine the Environment Canada nesting zone for each block, and the corresponding migratory bird nesting window. Nesting windows for zones found in the Skeena Business Area are A2 (Apr 4-Aug 11) and A4 (Apr 21-Aug 23).
- Nest density rankings have been established for VRI polygons intersected by planned blocks in the Skeena Business Area.
- Determine the nest density rankings for VRI polygons within a proposed block, and identify areas predicted to have high nest density rankings. During layout, these areas should be evaluated for high value habitat features, including
  - Riparian management zones
  - Deciduous pockets and brush patches
  - Lowland wet areas
  - Complex site types
  - High cut banks
  - Cliff ledges
  - Snags and stubs
- In areas of high risk, schedule harvesting and vegetation clearing to occur outside of the nesting window.

Forest managers should consider developing Standard Operating Procedures (SOPs) for the chance encounter of active bird nests. SOPs should be specific to the circumstances and activities but may include the following components.

- When an active nest or a bird is displaying nesting behaviour, stop work and report the occurrence to the site supervisor.
- Record the nest location with GPS and apply a no-disturbance buffer around the location.
- A 30 m no-disturbance buffer should be established around standard nest locations; a minimum 100 m buffer should be applied around stick nests.
- If the nest cannot be located, avoid work within 100 m of the location until the site can be reviewed by a qualified professional.
- Nest site location should be determined using non-intrusive monitoring methods only.
- Buffered nest sites should be avoided until after the nesting window, or once a nest's inactivity can be confirmed through non-intrusive monitoring.
- If the nesting species is determined to be a species of concern, note the location, date and additional information to be reported the provincial Conservation Data Centre.

## SNOW AVALANCHE TRACKS/CHUTES

Mammals	Avalanche Chute Value	Birds	Avalanche Chute value
Grizzly Bear Black Bear Kermode Bear	Spring feeding on carrion and roots; all summer feeding on herbaceous plants; fall feeding on berries, ground squirrels, marmots	Olive-sided Flycatcher	Nest along edges
Fisher Marten	Feeding on carrion, preying on small mammals	Bald Eagle	Feeding on carrion
Wolverine	Feeding on carrion; denning in debris piles	<b>Ecological Communities</b>	
Moose Mountain goat Deer	Feeding on herbs and shrubs	pearly everlasting - leafy aster	Habitat

- Do not construct a permanent road across or within 500 m of a snow avalanche track or chute, if possible.
- Render temporary roads impassable to traffic as soon as possible.
- For higher wildlife value avalanche chutes (> 1 ha is herbaceous, or > 10% of area of chute through the forest matrix is herbaceous) maintain a 100+ m forested buffer on each side. Partial cutting may occur in the buffer on one or both sides; harvesting should meet an objective to retain abundant mature conifer forest cover for wildlife.
- Use a default value of partial cutting being < 20% of total forest within 100 m of the chute.
- For lower wildlife value avalanche chutes (< 1 ha is herbaceous, or < 10% of area of chute through forest matrix is herbaceous) maintain a 50+ m forested buffer on each side. Partial cutting may occur in the buffer on one or both sides; harvesting should meet an objective to retain abundant mature conifer forest cover for wildlife.
- Use a default value of partial cutting being < 20% of total forest within 100 m of the chute.
- Ensure that management of avalanche chutes is consistent with the Grizzly Bear Identified Wildlife (2004) and Section 7 Notices.

## MARINE SENSITIVE FEATURES

A marine sensitive feature includes the following ecologically important habitats, biotic communities, or species that are sensitive to disturbances from coastal forestry practices.

- a) herring spawning areas;
- b) shellfish beds;
- b) saltwater marsh areas;
- c) aquaculture sites;
- d) juvenile salmonid rearing areas;
- e) adult salmon holding areas;
- f) the tidally or seasonally flooded (littoral) zone of a marine or estuary system;
- g) a marine area where the water is less than 10 m deep.

- In particular, note the last two categories of marine sensitive feature - Agency review is likely to highlight the other categories.
- Do not allow water contaminated by sediment, petroleum products, or chemicals to enter a marine sensitive feature from ditches, non-classified drainages, and overland flow from harvested areas or bladed access structures, or streams.
- All floating debris entering the marine environment from log dumping operations, A-frame or hand-logging operations, helicopter, or balloon drop area operations should be disposed of in a manner so that it does not re-enter or contaminate the aquatic environment by:
  - minimizing the introduction of debris to the marine environment by removing limbs and tops before yarding and avoiding long flight paths over water bodies.
  - containing debris entering the marine environment from A-frame, hand logging, or helicopter/balloon drop area operations by use of perimeter booms conducting periodic sweeps of the water surface to capture floating debris before it sinks.
- Minimize the risk of windthrow in areas not harvested near the feature.
- Maintain natural surface and subsurface water flows into the feature; ensure that road cuts do not disrupt subsurface flow patterns if it appears that subsurface flows may come to the surface at the feature - shallow water salinity and temperature, and low-tide beach moisture, may be dependent on such flows.
- If harvesting occurs within 30 m of the feature, obtain the advice of a qualified Professional as to whether serious harm to fish may occur through the proposed operations.

## MARINE INVERTEBRATES

### Northern Abalone

### Olympia Oyster

- Do not locate marine log drops or coastal log dumps in areas known or likely to be suitable habitat and utilized by listed marine invertebrates.
- Locate marine log drops, coastal log dumps, and booming grounds at least one kilometre from colonies of listed invertebrates.
- Preferentially use barges as a landing zone instead of dropping logs into the water.

## PROPOSED COASTAL LOG DUMP SITES PLANTS AND COMMUNITIES

### Red-Listed Plants

Arctic Daisy

Eminent Bluegrass

### Red-listed Ecological Communities

beaked ditch-grass Herbaceous Vegetation

Lyngbye's sedge Herbaceous Vegetation

sea plantain – dwarf alkaligrass

tufted hairgrass – Douglas' aster

tufted hairgrass – meadow barley

**Red-list Overall Objectives:** Manage 100% of the area occupied by red-listed plant species to maintain the suitability of the habitat for the existing plants and for the regeneration of new plants. Retain 100% of the area of red-listed ecological communities in natural mature/old seral condition - same species composition, physical structure, ecological processes, soil structure, absence of invasive species, etc. The objective can be fully monitored only once there is a reasonably complete inventory of ecological communities and other rare species; until then management decisions will need to be made on a site-specific basis. Each loss of part or all of an occurrence of a red-listed plant or community will significantly worsen its conservation status.

**Blue-list Overall Objectives:** Retain  $\geq 70\%$  of occurrences of the blue-listed species in healthy condition. Retain  $\geq 70\%$  of the area of a blue-listed ecological community in natural condition, at a landscape unit or large watershed level. Each loss of part or all of an occurrence of a blue-listed community will incrementally worsen its conservation status. These objectives can be fully monitored only once there is a reasonably complete inventory of ecological communities and other rare species; until then management decisions will need to be made on a site-specific basis.

**Red-list Strategies:** Protect all occurrences from all development; do not construct log dumps or conduct other operations.

- Provide communities with a 100 m no development buffer.
- If this is impossible, consult a biologist to develop a mitigation/ compensation plan that will maintain or enhance the population of the plant or community, as much as possible.

**Blue-list Strategies:** Protect most individual plants and ecological communities, and/or most of the habitat of known blue-listed plant populations, during log dump construction. Provide communities with a 100 m no-development buffer.

- If this is not possible, and since the plants and the community are blue-listed (not red-listed) the loss of one occurrence, or part of an occurrence, will have a relatively small adverse effect on its conservation status.
- Avoid concentrating and/or diverting subsurface or surface water flows into or away from the area inhabited by rare plants or ecological communities.

## PROPOSED COASTAL LOG DUMP SITES PLANTS AND COMMUNITIES (CONT'D)

Inventory: A biologist experienced in field inventory of rare species and able to identify these rare plants should do a rare plant inventory for a proposed coastal log dump site. Determine the intertidal ecological community composition at or within 100 m of proposed coastal log dump sites. Most of the intertidal communities that occur on in the BCTS Skeena area are red-listed, one is blue-listed.

- Provide the Conservation Data Centre (Victoria) with a map, photographs, description, GPS coordinates of any red-list or blue-list plant or ecological community found, so that the abundance and locations of the species can be tracked.

### SHORELINE NESTS

Trumpeter Swan

Great Blue Heron

- Where a Trumpeter Swan nest site is identified, establish a 500 m management zone around the wetland or lake. Do not construct roads within 200 m of the shoreline; avoid operations within the next 300 m during the breeding season (April through July). Maintain a visual buffer along the edge of the wetland or lake; the normal reserve zone may be adequate.

### MARINE MAMMALS

Grey Whale

Harbour Porpoise

Humpback Whale

Northern Sea Lions

Killer Whale

- Do not locate marine log drops or coastal log dumps in areas known or likely to be used by marine mammals.
- Locate marine log drops, coastal log dumps, and booming grounds at least one kilometre from feeding areas and migration corridors of marine mammals.
- Preferentially use barges as a landing zone instead of dropping logs into the water.

## BEAR AND WOLVERINE DENS

American Black Bear  
Kermode Black Bear

Grizzly Bear  
Wolverine

- For Grizzly Bear ground dens, determine whether the den has been used in the last two years, or if there are others that have been used in the last two years within, or within 200 m of, the area proposed for development (this may require a biologist).
- Any additional bear dens that are found will also need management.
- If no dens are found that have been used in the last two years, proceed with development; the area is apparently relatively low importance as den habitat.
- If one or more dens are found that have been used in the last two years, defer all development within 200 m of a den and consult with a qualified Professional and the Ministry of Environment regarding how to manage the area.
- Consider deactivating all roads within 500 m of an area that has two or more recently used dens, to minimize future disturbance.
- For all occupied bear dens, do not conduct mechanized operations close enough to disturb the sleeping bear.
- As a default, do not conduct operations within 500 m.
- It may be possible to operate closer than 500 m if topography will reduce sound and ground vibration transmission, or if there is already on-going activity such as a major road closer than 500 m on the same side of the den.
- For a known Wolverine maternal den site, when harvesting or road construction is considered in the vicinity, provide a draft WHF boundary around it (suggestion - a 100 m radius) and treat as a no-harvest area.

## UNGULATES

Mule Deer  
Sitka Black-tail Deer  
White-tail Deer

Mountain Goats  
Moose

- Implement Higher Level Plan direction for these species, at both the stand level and landscape level.
- Implement General Wildlife Measures from Section 7 Notices and GAR Orders for each species.

## IDENTIFIED WILDLIFE

Coastal Tailed Frog	Wolverine
Bull Trout	Great Blue Heron
Grizzly Bear	Northern Goshawk
Fisher	Marbled Murrelet

- Implement, as much as possible, the Identified Wildlife Management Strategy (2004) for these species, at both the stand level and landscape level. Implementation of some of the landscape level planning aspects may depend upon the cooperation of government agencies and other industry members.
- Implement the Section 7 Notices for each species.
- Implement the intent of the guidelines provided by Mahon (2003) for the interior subspecies *atricapillus* - manage nest sites to meet the objectives of a Goshawk Habitat Area:
- Maintain nesting and post-fledging habitat at **known** goshawk nest areas to support continued use and reproduction at those areas, using the guidelines provided by Mahon (2003). Design retention areas (WTPs, etc.) focussed on known nest sites with at least a 100 m buffer on all sides; the retention area size and quality should be as similar to that recommended by Mahon (2003) as possible.
- Cutblock and road design should avoid impact within known goshawk nest areas
- Maintain connectivity of the nest areas to adjacent areas of mature forest.
- Maintain potential alternate nest areas within 1 km of the original nest area.
- To detect unrecorded Northern Goshawk nest sites, field crews should watch for raptors that may be goshawks, and raptor nests, **below the canopy level** of older, closed canopy conifer stands; this restriction will eliminate most sightings of other raptors and raptor nests.
- To detect unrecorded Northern Goshawk nest sites, field crews when planning development in areas mapped as "high" potential nesting habitat (raw suitability values  $\geq 0.75$ ), on the available nest area habitat suitability mapping, should be advised to pay particular attention to the potential presence of goshawks and their nests.

## RED-LISTED AND BLUE-LISTED PLANTS GLOBALLY UNCOMMON TO RARE

Oldgrowth Specklebelly  
White-lip Rein Orchid  
Arctic Daisy  
Cryptic Paw

Frosted Glass-whiskers  
Mountain Moonwort  
Eminent Bluegrass  
Whitebark Pine

**Overall Objective:** Manage 100% of the area occupied by these plant species to maintain, and preferably enhance, the suitability of the habitat for the existing plants and for the regeneration of new plants. Each loss of part or all of an occurrence of each of these species will worsen their conservation status.

**Option 1:** Protect the plant occurrences with no-harvest reserves such as wildlife tree patches or OGMAs; do not construct roads or conduct other operations in the reserves. For species requiring interior forest conditions (oldgrowth specklebelly, mountain moonwort), leave a buffer (preferably 200+ m wide) to maintain interior forest conditions.

**Option 2:** If operations are a desired and apparently reasonable option, consult a biologist to develop management strategies for harvesting, silviculture and road construction:

**Harvesting:** Harvesting may be able to occur, but will need to be designed to maintain ecological variables such as soil moisture, shade, humidity, and low wind speeds (where relevant to the species). Ground disturbance should be avoided. Reduced crown closure may improve the habitat of some plant species in some locations.

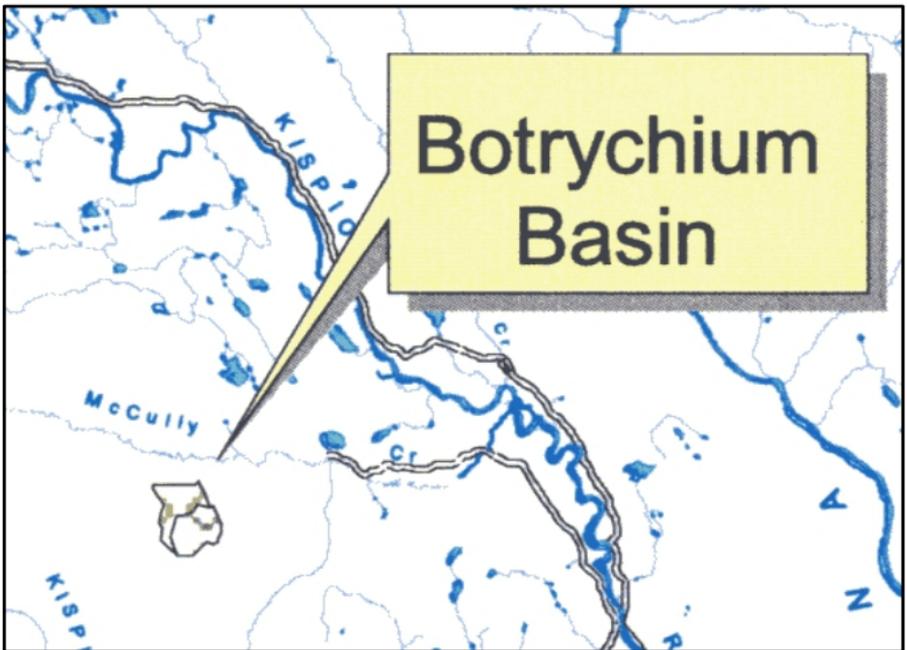
**Silviculture:** A site preparation and planting prescription for the plant habitat should be developed to maintain the species in occupied sites, both in the short-term and the long-term. Stand density may need to be maintained lower than normal, and the appropriate tree species selected. Avoid use of herbicides.

**Roads:** Develop road construction plans to maintain the species in occupied sites and perhaps create new habitat in the cleared right of way.

- If a road must be built through the area occupied by the plants, minimize the area impacted and consider ways to minimize impacts in the cleared right of way.
- Develop road construction plans to maintain stubs, decaying old logs, and low shrub and herbaceous vegetation in the right of way, where possible (i.e. avoid stripping the soil surface).
- Maintain the area occupied by the plants as an herbicide-free zone.
- Avoid concentrating and/or diverting subsurface or surface water flows into or away from the area inhabited by the plants.
- A biologist experienced in field inventory of rare plant species should survey for the species when developing harvest and road construction plans within a 2 km radius of known sites.
- Forestry field crews should be aware of the appearance of mountain moonwort, and watch for it during normal layout (etc.) work in the summer within a 10 km radius of known sites.

## RED-LISTED AND BLUE-LISTED PLANTS GLOBALLY UNCOMMON TO RARE (CONT'D)

- Protect most individual whitebark pine trees and/or most of the habitat of known whitebark pine populations during harvesting, road construction, and silviculture. Most of the trees will be outside areas of merchantable timber, or on rocky outcrops within otherwise merchantable areas; hence, avoidance should generally be possible.
- Within the area of possible occurrence of whitebark pine (high elevation along the southeast boundary of Kalum District, south of Hwy 16), ensure that the occurrence and location of all individual whitebark pine are noted during block and road layout
- Where feasible and operationally reasonable, consider inventory of conifer stands that appear to be very old (standing trees > 250 years combined with similar size fallen logs in a state of advanced decay) in the CWHvh2 and CWHvm for oldgrowth specklebelly, and in the ICHmc2 for the mountain moonwort prior to development.
- Consider inventory/search by a specialist for additional populations in the CWH and ICH of frosted glass-whiskers (especially) and the other globally uncommon or rare plants, if funds are available through non-operational sources such as the Forest Investment Account.
- Provide the Conservation Data Centre (Victoria) with a map, photographs, description, GPS coordinates, and a sample of the plant for each plant location, so that the abundance and locations of the species can be tracked.



Location of "Botrychium Basin", an area of antique forest that supports populations of very rare moonworts and lichens

## RED-LISTED ECOLOGICAL COMMUNITIES – FORESTED

lodgepole pine/kinnikinnick	Sitka spruce/salmonberry CWHws1
Sitka spruce/false lily-of-the-valley CWHwh1	Sitka spruce/tall trisetum
Sitka spruce/salmonberry CWHvm	

**Overall Objective:** Retain 100% of the area of red-listed ecological communities in natural mature/old seral condition. Each loss of part or all of an occurrence of a red-listed community will significantly worsen its conservation status.

- Do not harvest, salvage, remove non-timber forest products, build roads, or otherwise develop within the community, or within a 100 m or two tree length (whichever is less) buffer, unless high tree mortality has occurred. The buffer distance should be increased or decreased to use logical geographic, topographic, wind firm, or existing man-made boundaries (such as roads or rights of way). If the occurrence is narrow, such as along a ridge top, increase the buffer width up to another 100 m to provide an approximation of interior forest conditions.
- Harvest only if  $\geq 70\%$  of the mature/old tree component of this ecological community or its buffer has been killed by insects, disease, fire, or windthrow. In consultation with a biologist develop a salvage plan (including post-harvest silviculture) that meets the objectives of (1) minimizing short-term alterations to the community, including retention of most still living trees; and (2) achieving a long-term mature ecological community (trees and understory) with characteristics within the natural range of variation for the ecological community. The biologist may determine that the best option to meet the conservation objectives is “no harvest”.
- If road development is required to pass through the community or the buffer, because there is no alternative route, consult a biologist and develop management strategies that will best meet the above objectives for as much of the community as possible.
- Maintain the community as a pesticide-free zone.
- Avoid concentrating and/or diverting subsurface or surface water flows into or away from the community.
- Avoid impacts to vegetation, soils, and hydrology when operating in adjacent areas, particularly during land clearing, and road location, construction, and maintenance.
- Determine the forest ecological community types impacted by, or within 100 m, of proposed road or harvesting development.
- Provide the Conservation Data Centre (Victoria) with a map, photographs, description, and GPS coordinates for the location of any red- or blue-listed ecological community that is found, so that the abundance and locations of the community can be tracked.

Natural mature/old seral condition” includes the same tree (both conifer and deciduous) and understory species composition, physical structure, ecological processes, degree of canopy closure and tree density, large old trees, range of tree sizes, large snags, downed logs, surface litter, microbial crust, soil structure, absence of invasive species, interior forest conditions, etc. Mature/old seral condition declines as an increasing proportion of the trees in a stand die. The value of  $>70\%$  of trees dead as being the point at which mature/old seral attributes have declined sufficiently that it is reasonable to harvest the stand so that it can be regenerated is inherently arbitrary; the declines in mature/old attributes are continuums that differ for each attribute.

## BLUE-LISTED ECOLOGICAL COMMUNITIES – FORESTED

red alder/salmonberry/ common horsetail	western redcedar – Sitka spruce/ devil's club CWHvh2
Sitka spruce/slough sedge	western redcedar – Sitka spruce/skunk cabbage
western hemlock – Sitka spruce/lanky moss	western redcedar - western hemlock/ sword fern

**Overall Objective:** Retain  $\geq 70\%$  of the area of blue-listed ecological communities in natural mature/old seral condition, at a landscape unit or large watershed level. Each loss of part or all of an occurrence of a blue-listed community will incrementally worsen its conservation status. The objective can be fully monitored only once there is a reasonably complete inventory of ecological communities; until then, management decisions will need to be made on a site-specific basis.

- Minimize immediate loss of ecological community area by harvesting this stand type at a lower rate than more common community types:
- Focus WTPs, OGMA, and deferred harvest areas on occurrences of the ecological community; where the community occurs as a large patch, or group of patches that are close together, harvest only part of the total area.
- Locate roads, landings, and bladed trails outside the ecological community, and outside a 100 m buffer (especially upslope, to maintain seepage hydrology), where possible. If roads must be within the ecological community area or the buffer, minimize the clearing width and amount of disturbed soil adjacent to the road surface. Where possible, rehabilitate and replant roads, landings and bladed trails to regenerate as similar to the original community as possible.
- When harvesting of adjacent areas will result in a moderate to high windthrow risk to the ecological community, use measures (inside or outside the community) such as WTP placement, block boundary location/shape, or feathering to reduce the windthrow risk
- Minimize the recovery time of harvested ecological community area:
- Avoid use of site preparation practices that modify soil structure or hydrology, such as disk trenching, ditching, or mounding.
- Use natural regeneration where possible/reasonable; alternatively plant a mix of conifer and deciduous tree species in proportions that will result in a new mature stand similar to the harvested stand, including expected natural ingress.
- Avoid use of vegetation management practices that may alter the entire vegetation community, such as broadcast herbicide application or stand tending that removes less economically desirable tree species that are a natural component of the ecosystem.
- Minimize introduction of alien plant species by only using quality seed mixes that have low occurrence of weed seeds, when re-vegetating disturbed soil areas such as roads, landings and bladed trails.
- Determine the forest ecological community types impacted by, or within 100 m, of a proposed road or harvesting.
- Provide the Conservation Data Centre (Victoria) with a map, photographs, description, and GPS coordinates for the location of any red- or blue-listed ecological community that is found, so that the abundance and locations of the community can be tracked.

## RED-LISTED ECOLOGICAL COMMUNITIES – NON-FORESTED

beaked ditch-grass Herbaceous Vegetation  
few-flowered spike-rush / hook-mosses  
Hudson Bay clubrush / rusty hook-moss  
Lyngbye's sedge Herbaceous Vegetation

Pacific willow/red-osier dogwood/ horsetails  
pearly everlasting - leafy aster  
purple reedgrass Herbaceous Vegetation  
Sandberg's bluegrass – slender wheatgrass

Saskatoon – slender wheatgrass  
sea plantain – dwarf alkaligrass  
Sitka sedge / peat-mosses  
Sitka willow - Pacific willow / skunk  
cabbage  
sweet gale / Sitka sedge  
tufted hairgrass – Douglas' aster  
tufted hairgrass – meadow barley  
western hemlock – cloudberry – peat-  
mosses

**Overall Objective:** Retain 100% of the area of red-listed ecological communities in natural mature/old seral condition – same species composition, physical structure, ecological processes, soil structure, absence of invasive species, etc. Each loss of part or all of an occurrence of this red-listed community will significantly worsen its conservation status.

- Do not develop within the community, or within a 100 m buffer.
- If road development is required to impact the community or the buffer, because there is no alternative route, consult a biologist and develop management strategies that will best meet the above objectives for as much of the community as possible.
- Avoid concentrating and/or diverting adjacent terrestrial water flows into or away from the community.
- Ensure that subsurface or surface seepage flows that are essential to some communities are maintained at natural levels, without increased sediment inputs.
- Determine the non-forested ecological community types impacted by, or within 100 m of, a proposed road or harvesting.
- Provide the Conservation Data Centre (Victoria) with a map, photographs, description, and GPS coordinates for the location of any red- or blue-listed ecological community that is found, so that the abundance and locations of the community can be tracked.

# FOCAL WILDLIFE SPECIES IDENTIFICATION

This is a reference for field identification of focal wildlife species within the BCTS Skeena Business Area. Correct identification of rare wildlife is essential for their management.

## Training

Field staff should attend a plant identification and management strategy workshop annually.

## Process

1. Identify a species as *potentially* being a rare wildlife species.
  - Record GPS coordinates of location
  - Describe habitat, including dominant plants or any special features at the location
  - Describe the landscape context, including surrounding area and adjacent land. Note any evidence of historical disturbance, habitat fragmentation, adjacent roads or development, etc.
  - Describe the condition of the habitat, including any evidence of destruction, degradation, disturbance or presence of exotic or domestic species.
  - Note the condition of the animal(s), including dead/alive and evidence of sickness or injury.
  - If possible, collect photographs of the individual and surrounding habitat.
  - Confirm identification with a qualified person.
2. Site visit by a qualified professional.
  - Determine the extent of the species and its habitat; and
  - Develop site-specific management strategies, based on the *Updated Guide to Species of Management Concern, British Columbia Timber Sales Skeena Business Area (2017)*.
3. Incorporate the management strategies into the Site Plan and operational plans.
4. Document all steps in the process.

## Specimen Documentation

See the Conservation Data Centre <http://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/conservation-data-centre>. Copies of the field collection forms for use in field notebooks are at the end of this Guide (plants, animals and ecosystems).

### **Primary Sources**

B.C. Conservation Data Centre

Guppy, C.S. 2017. Guide to Species of Management Concern in the British Columbia Timber Sales Skeena Business Area. - and references therein

Identified Wildlife Management Strategy (IWMS). 2004. Accounts and Measures for Managing Identified Wildlife. Ministry of Water, Land and Air Protection. Victoria, BC

## COASTAL TAILED FROG

*Ascaphus truei*

Tadpoles are relatively large (up to 3 cm), and black with white spot at tip of tail. Tailed frogs may remain in this stage for up to four years before metamorphosis. Adults are small (4-5 cm) with a large head; variable in colour. Males will have tail-like copulatory organ.



Source: McElhanney



Source: McElhanney

**HABITAT:** Tadpoles rear in permanent, cool mountain streams, with step-pool morphology and coarse, stable substrates. Often found attached to bottom of platy rocks in the stream. Adults prefer mature to old-growth forest that which provides shade for rearing streams and coarse woody debris for breeding.

### CONSERVATION STATUS

Global G4

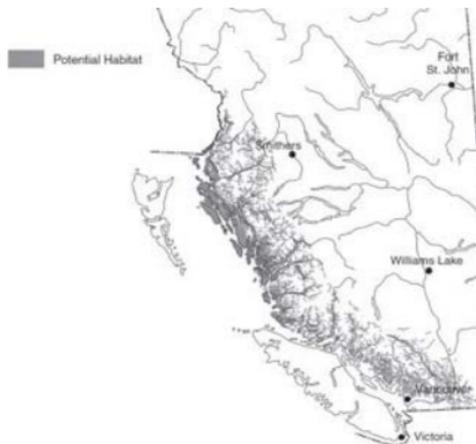
BC S3S4

BC List Blue

COSEWIC Special Concern

SARA Special Concern

### Range and Distribution



Source: IWMS 2004

## WESTERN TOAD

*Anaxyrus boreas*

Adults are large and stocky, up to 15 cm in length. Warty skin is variable in colour, from brown to green to reddish, with a pale dorsal stripe. Tadpoles are small and black.

Highest risks are during mass migration of sub-adult toadlets from breeding ponds to adjacent upland forests in late summer. Migration over roads can result in substantial mortality.



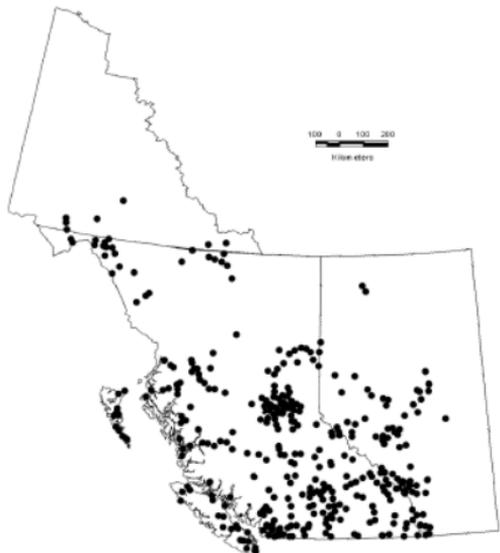
Source: McElhanney

**HABITAT:** Breed in a wide variety of slow moving or stagnant water bodies, ranging from temporary pools to lake margins. In late summer, post-metamorphic aggregations migrate *en masse* from breeding ponds to adjacent upland areas, often crossing roads. Adults are relatively terrestrial, and can be found on forested slopes well-removed from water bodies.

### CONSERVATION STATUS

Global	G4
BC	S3S4
BC List	Blue
COSEWIC	Special Concern
SARA	Special Concern

### Range and Distribution



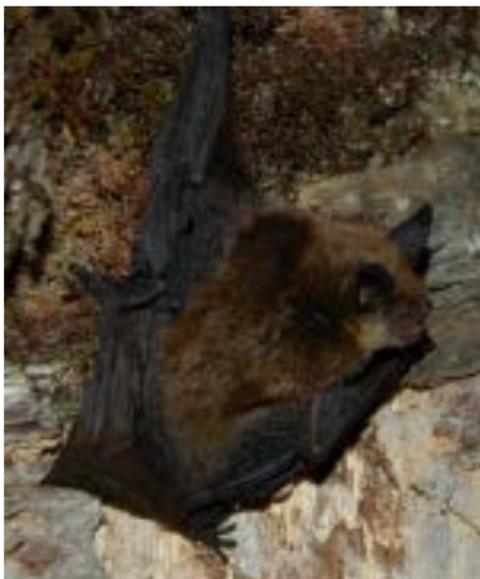
Source: COSEWIC

# LITTLE BROWN BAT

*Myotis lucifugus*

Medium-sized bat, 7-10 cm in length, with dark brown wings and fur ranging from yellowish to dark brown. Forages at dusk on a wide variety of insects.

Recently received an emergency listing as Endangered under the federal Species at Risk Act. Mainly threatened by the spread of White-Nose Syndrome, a highly contagious disease that disturbs hibernation, resulting in excess energy expenditure during vulnerable periods. The disease has not yet been recorded in BC, but the species is of management concern due to the disease's rapid spread.



Source: Environment Canada

**HABITAT:** Forage over open areas such as rivers, lakes and wetlands. Maternity colonies and summer roosts found in cavity trees and hollow trunks; can also roost under loose bark on mature and old-growth conifers. Generally hibernate in caves, abandoned mine shafts or deep rock crevices, but may overwinter in

## CONSERVATION STATUS

Global G3

BC S4

BC List Yellow

COSEWIC Endangered

SARA Endangered

## Range and Distribution



Source: Ministry of Environment

# NORTHERN GOSHAWK

*Accipiter gentilis*

A large hawk, about the size of a raven, with short, broad wings and a long, narrow tail. Adults are dark bluish-grey above and light grey and finely barred below; immature goshawks are similarly patterned, but brown in colour. Goshawks have a distinctive whitish stripe above the eye.

Prey on a variety of small mammals and medium-sized birds.



Source: *FLNRO 2013*

**HABITAT:** Large tracts of continuous, coniferous forest. Preferred stands will be mature to old-growth mesic forest with relatively closed canopy and open understory.

## CONSERVATION STATUS

Global G5T2

BC S2B

BC List **Red**

COSEWIC Threatened

SARA Threatened

## Range and Distribution



Source: *COSEWIC 2013*

## MARbled MURRELET

*Brachyramphus marmoratus*

A small, plump seabird, football-shaped with short wings and a short, pointed bill. Dark brown to black above; mottled below. Light underparts extend around collar nearly to the back of the neck. Fly with rapid wingbeats.



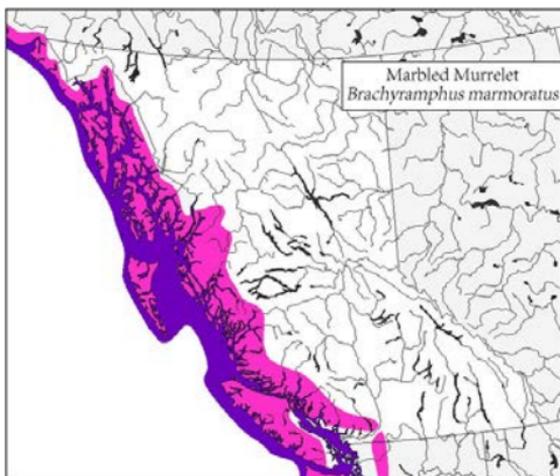
Source: Cornell Lab of Ornithology

**HABITAT:** Nest on mossy platforms on large limbs of old-growth conifers, well off the ground. Can nest as far as 100 km inland. Preferred stands will be old-growth spruce or hemlock forest with high canopy complexity.

### CONSERVATION STATUS

Global	G3
BC	S3B, S3N
BC List	Blue
COSEWIC	Threatened
SARA	Threatened

### Range and Distribution



Source: E-Fauna BC

# COMMON NIGHTHAWK

*Chordeiles minor*

Medium-sized, slender bird with long pointed wings. Underside is mottled brown and grey, with white wrist patches. Active at dusk and dawn, chasing flying insects in looping flight over open areas. Call is a sharp peent. Extremely well camouflaged on the ground.



Source: McElhaney

**HABITAT:** Forage over open areas such as rivers, lakes and wetlands. Nest on the ground in open areas such as gravel pits and burned forests. Nest sites are nearly imperceptible. Has been known to nest on gravel rooftops.

## CONSERVATION STATUS

Global	G5
BC	S4B
BC List	Yellow
COSEWIC	Threatened
SARA	Threatened

## Range and Distribution



Source: E-Fauna BC

# OLIVE-SIDED FLYCATCHER

*Contopus cooperi*

Medium-sized songbird with greenish-brown back and flanks, and lighter underparts. Subtle crest above the forehead, with relatively short beak. Song is a distinctive *quick, three beers*.



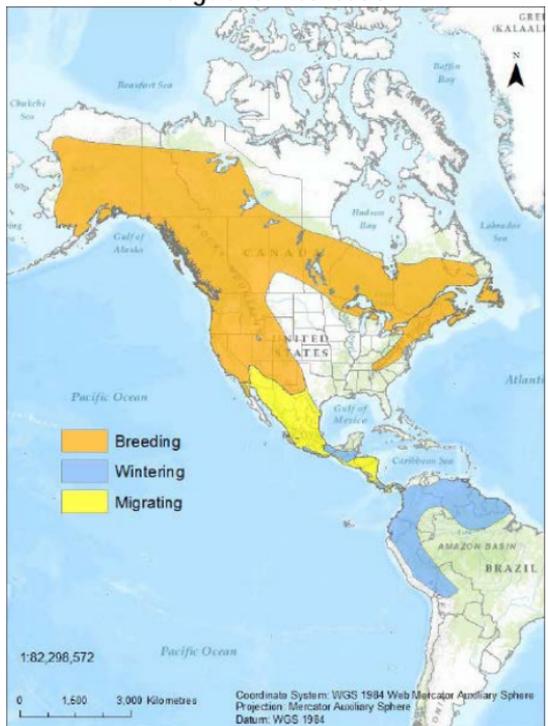
Source: Environment Canada

**HABITAT:** Forages aerially in deciduous canopies for a variety of insects. Perches prominently on stumps and snags in open areas such as clearcuts and wetlands.

## CONSERVATION STATUS

Global	G4
BC	S3S4B
BC List	Blue
COSEWIC	Threatened
SARA	Threatened

## Range and Distribution



Source: Environment Canada

## GREAT BLUE HERON, *fannini* subspecies

*Ardea herodias fannini*

Tall wading bird with long legs, neck, wings and bill. Plumage grey white and blue, with plumes extend from back of head.

Sensitive to habitat loss and disturbance, particularly where large colonies are found adjacent to areas of high activity levels.

Nests are protected year-round under the provincial Wildlife Act, regardless of current activity level.



Source: COSEWIC

**HABITAT:** Wades in a variety of water bodies, from small ponds and wetlands to side channels of rivers and margins of lakes and marine sites. Build large stick nests in a wide variety of riparian habitats, including tall shrubs and mature conifers. May nest in large colonies, particularly in coastal habitats.

### CONSERVATION STATUS

Global G5T4

BC S2S3B,S4N

BC List Blue

COSEWIC Special Concern

SARA Special Concern

### Range and Distribution



Source: COSEWIC

# PLANT SPECIES IDENTIFICATION

It is important to note that many of the plant species are found only in very specific habitats, and therefore do not need to be looked for elsewhere. This greatly reduces the number of rare plants that have the potential to occur in any one specific site.

## Training

Field staff should attend a plant identification and management strategy workshop annually.

## Process

1. Identify a plant as *potentially* being a rare plant species.
  - Record detailed plant locations, and start filling out rare plant form provided at the end of this Guide. Keep the form with the specimen.
  - Photograph the plant and general habitat.
  - Collect a sample if it is possible to do so without extensive damage to the plant.
  - Confirm identification with a qualified person (may need to be sent to a specialist in Victoria or elsewhere) - may or may not be a Professional, but must have high botanical identification skill.
2. Site visit by a qualified Professional.
  - Determine the extent of the species and its habitat; and
  - Develop site-specific management strategies, based on the *Updated Guide to Species of Management Concern, British Columbia Timber Sales Skeena Business Area (2017)*.
3. Incorporate the management strategies into the Site Plan and operational plans.
4. Document all steps in the process.

## Specimen Collection and Documentation

See the Conservation Data Centre <http://www.env.gov.bc.ca/cdc/contribute.html>. Copies of the field collection forms for use in field notebooks are at the end of this Guide (plants, animals and ecosystems).

### **1. Record plant location**

Flag and record GPS coordinates of the site (point or area boundaries) where the potential rare plant species occurs. Photograph the plant and the habitat.

### **2. Specimen Collection**

- Collect a piece of the plant for a sample, for office identification or to send to a botanist.
- Ensure that the population is large enough to sustain a sample to be taken: if there are 20 or more plants, collect a complete specimen including the root system, and reproductive structures (flowers/fruits). Otherwise, collect a single leaf (if the plant has more than one leaf) and a flower and/or fruit (this will not harm the plant).
- Place plant sample in a plastic bag for transport. Remove as much air from the bag as possible, do not fold plant or damage reproductive structures.
- Press the plant if possible, if not, refrigerate for no more than 5 days.
- Plant pressing:
  - Set down piece of plywood just larger than the specimen.
  - Place cardboard sheet on plywood and cover with newspaper.
  - Place specimen on newspaper and cover with another newspaper.
  - Cover with cardboard sheet, and another plywood sheet.

- Tighten with rope or strap.
- Plant drying time 5-10 days.

### 3. Confirm Identification

- Have the identification completed by a trained botanist or other qualified Professional.
- Complete the Conservation Data Centre Field Survey Form for plants (provided at the end of this field guide) and send to the CDC, preferably with the pressed sample of the plant (they will double-check the identification, and place the specimen in a museum collection). The CDC will use this information when reviewing the conservation status and distribution of the species.

#### Primary Sources

Klinkenberg, Brian. (Editor) 2008. E-Flora BC: Electronic Atlas of the Plants of British Columbia [[www.eflora.bc.ca](http://www.eflora.bc.ca)]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver.

The Illustrated Flora of BC

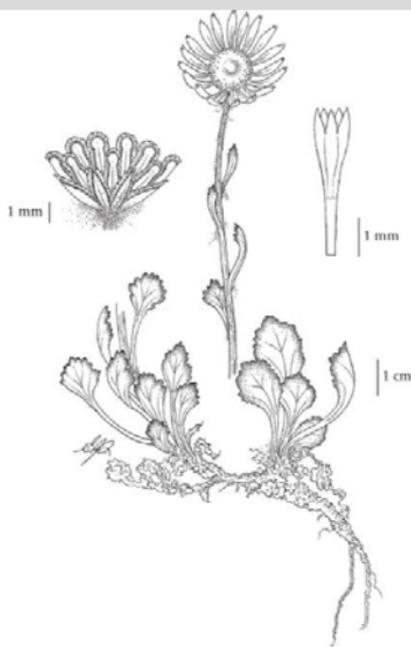
B.C. Conservation Data Centre

Guppy, C.S. 2008. Guide to Species of Management Concern in the British Columbia Timber Sales Skeena Business Area. - and references therein

## PLANTS WITH OBVIOUS FLOWERS

**ARCTIC DAISY**  
*Arctanthemum arcticum* ssp. *arcticum*

A small compact plant with a white flower head that is “daisy-like” with a greenish center. It is a perennial herb from a creeping rhizome or woody stem-base; stems erect, ascending or decumbent, solitary to several, 6-40 cm tall. Flower heads with both ray and disk flowers, solitary with woolly-hairy bases; involucre 7-13 mm tall; ray flowers white, 10-25 mm long; disk flowers yellow. Basal leaves palmately lobed or pinnately cut, wedge-shaped to rounded, 1.5-16 cm long, 0.4-4.5 cm wide, glaucous or green, glabrous or woolly-hairy when young, persistent at flowering time; stem leaves alternate, reduced upwards, only the uppermost entire.



*Leucanthemum arcticum*

Source: *The Illustrated Flora of BC*

**HABITAT:** Wet to moist gravelly shores and salt marshes. Occurs only along the edge of the ocean.

**BEC:** CWHwm

**CONSERVATION STATUS**

Global	G5TNR
BC	SH (Historical)
BC List	<b>Red</b>
COSEWIC	Not Assessed
SARA Schedule	N/A

**Range and Distribution**



## WHITE-LIP REIN ORCHID *Platanthera ephemerantha*

The white-lip rein orchid (*Platanthera ephemerantha*) is a perennial herb from tubers, with a few fibrous roots, with flower stems up to 55 cm high. Leaves are prostrate to more or less erect; 10-18 cm long, 2-3.5 cm wide, dull to glossy green below, glossier above, withering before or during flowering.

Inflorescences densely flowered; the flowers are small and white, faintly and unpleasantly scented. The upper sepal is pointed forward, white with a green midvein or green with white margins; the lower sepals are white with a faint green midvein, usually greenish early in flowering. The petals are white with a green midvein, more or less pointed forward, the tips overlapping or nearly touching; lip 2-3 mm long, white, sometimes green at tip, narrowly triangular, bent back toward the spur.



Source: *The Illustrated Flora of BC*

**HABITAT:** Inhabits dry forests and forest margins in the lowland to montane zones. The BCTS Skeena known site is White Island (= White Islets?), off Dundas Island. The *Rare Plants* book also shows a record for Prince Rupert, but neither the CDC nor the E-Flora includes that record

**BEC:** CWHvh

### CONSERVATION STATUS

Global	G3?
BC	S2
BC List	Red
COSEWIC	Not Assessed
SARA Schedule	N/A

### Range and Distribution



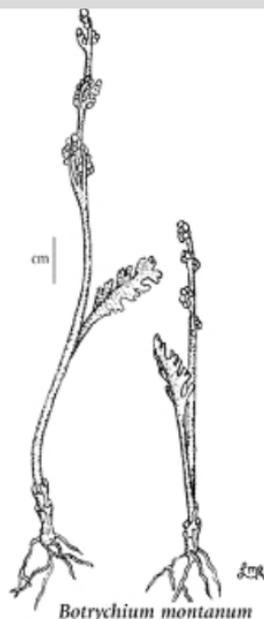
## MOONWORTS

When moonworts are found in an area, many plants should be carefully examined to see if there is variation that might indicate there is more than one species present. Specimens that include the full range of variation should be collected, pressed, and identified to species by a qualified botanist (see the plant identification introduction for how to press plants). The most common and distinctive species in the Skeena area is rattlesnake fern *Botrychium virginianum*.

# MOUNTAIN MOONWORT

*Botrychium montanum*

A small perennial fern with a single above ground frond. The frond varies in height but may reach a height of 12 cm. It is a dull, glaucous gray-green, somewhat succulent, and divided into two segments that share a relatively short common stalk. The sterile segment is once pinnatifid with well separated, irregular, angular, ascending lobes with entire or toothed margins. The fertile segment is longer than the sterile segment, is branched, and bears grape-like sporangia. **The glaucous gray-green color, succulent texture, relatively short common stalk, and irregular angular lobes rather than distinct pinnae are diagnostic of mountain moonwort**, but it could be mistaken for the upswept moonwort. Reliable field determination of moonworts depends on the careful use of technical keys.



Source: *The Illustrated Flora of BC*

**HABITAT:** Mesic, shady coniferous (mostly western red cedar) forests in the upper montane and lower subalpine zones.

Special consideration should be given to management of this species, because it is globally uncommon. The known Skeena location is an area of antique forests near with McCully Creek that is an Old Growth Management Zone under the Kispiox SRMP Higher Level Plan. The coordinates provided by the CDC are too far east.

**BEC:** ICHmc

## CONSERVATION STATUS

Global	G3
BC	S2?
BC List	Red
COSEWIC	Not Assessed
SARA Schedule	N/A

## Range and Distribution



## LICHENS

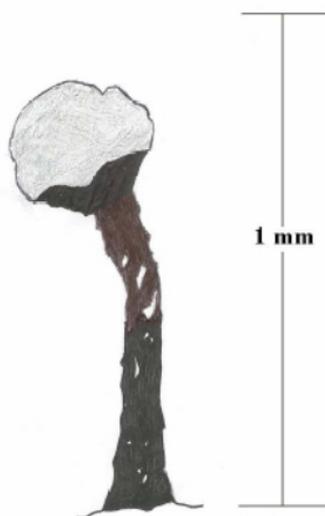
Lichens can usually only be reliably identified by specialists, and this includes the three rare lichens in the BCTS Skeena Business Area. However, with extra effort they can be found and tentatively identified in the field from the descriptions.

The Frosted Glass-whiskers will require a specific search effort, because it is such a tiny species. However, the pale surface of the apothecia may stand out against a darker background of wood or bark, allowing it to be spotted. The other two lichens are reasonably large "leafy" lichens, which are easy to see. The Frosted Glass-whiskers sample should be collected by carefully cutting off a small piece of wood with a few apothecia, and then protecting the sample from damage - photograph it first, and do not remove the entire colony. The two leafy lichens should be collected by collecting a sample of foliage that bears the lichen – there is no concern with removing the only sample you find, there will almost certainly be more in the tree canopy.

## FROSTED GLASS-WHISKERS

*Sclerophora peronella*

This species belongs to a group of lichenized fungi with tiny stalked spore-bearing structures. It can be recognized by the pale color of its spore-bearing apothecia that are raised on stalks 0.5 to 0.8 mm above the substrate. The main body (thallus) of the lichen is imbedded in the substrate. There are only 3 known locations for North America, one in BC and two in Nova Scotia. The BC site is at a provincial park as the south end of Kitsumkalum Lake (a former forest service Recreational Reserve).



Source: COSEWIC 2005

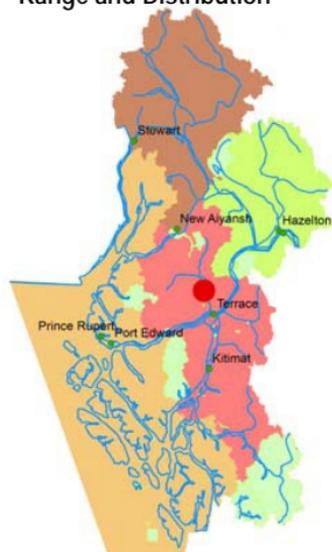
**HABITAT:** Occurs on hardwoods, usually exposed heartwood of living trunks and more rarely on bark. Often associated with mature and old-growth coniferous and deciduous forests, but also occurs in savannas and parklands. In BC the single specimen found was collected on bark at the base of a large black cottonwood in a rich, shady cottonwood stand.

**BEC:** ICH - lower elevation

### CONSERVATION STATUS

Global	G3G4
BC	S1
BC List	Red
COSEWIC	Data Deficient
SARA Schedule	N/A

### Range and Distribution



**CRYPTIC PAW**  
*Nephroma occultum*

A foliose lichen that is leafy, rounded and loosely pressed in appearance. The **upper surface is pale yellowish- to greenish- or bluish-grey, and having net-shaped ridges**; the lower surface is and pale tan to sometimes blackish. **Both sides are dull and naked** (hairless). The bottom is finely wrinkled. Size is 2 to 7 cm across, and has rounded lobes 4-12 mm wide. It produces many asexual propagules, called soredia, along the margins and the ridges of the upper surface, and lacks apothecia, the spore-producing sexual stage of reproduction. Some forms of *Nephroma parile* are similar, but in that species the upper surface is usually brownish and is at most weakly wrinkled, never net-ridged.



Source: *Lichens of British Columbia*

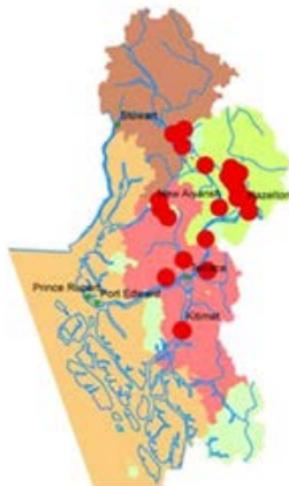
**HABITAT:** Humid old-growth conifer forests, with high humidity and moderate summer temperatures. The lichen occurs most frequently in the mid to upper canopy, on bark and wood of conifers; but the lichen is most commonly found on or near the extreme branch tips of understory conifers (presumably the soredia dropped from the canopy).

**BEC:** CWH, ICH

**CONSERVATION STATUS**

Global	G4
BC	S2S3
BC List	Blue
COSEWIC	Special Concern
SARA Schedule	Special Concern

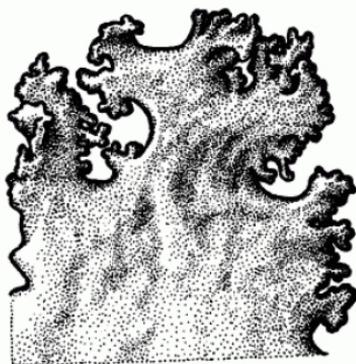
**Range and Distribution**



## OLDGROWTH SPECKLEBELLY

*Pseudocyphellaria rainierensis*

A lichen that is large (5 to 12 cm across), broad-lobed, and loosely attached. The dull upper surface is a pale greenish-blue that is usually smooth, although short stiff hairs may appear and make it feel rough. The top is also often weakly dimpled. This is the only BC lichen with a **spotted lower surface (tiny white spots on a pale brownish background)**, a **white medulla**, and **torn lobe margins**. The underside is also wrinkled and matted with short tufts of hair. The lobes are short to elongate, thin, stiff and brittle; they loosely overlap and measure 1.5 to 3 cm across. The two known sites in the Skeena are at the western end of Douglas Channel about 45 km west of Kitimat in Hartley Inlet, and east of Kitimat on the trail to Robinson Lake leading from the road between Kitimat and Kitimat Mission.



Source: *The Illustrated Flora of BC*

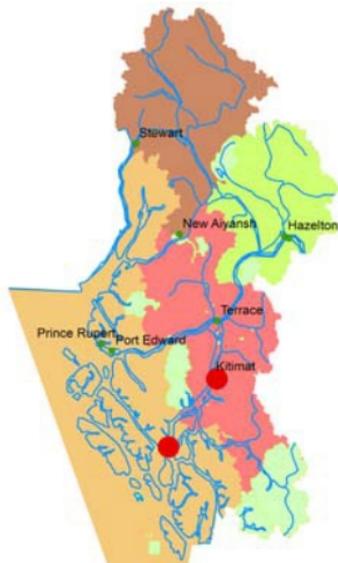
**HABITAT:** Trees and shrubs in humid coast old-growth forests at lower elevations.

**BEC:** CWH

### CONSERVATION STATUS

Global	G3G4
BC	S2S3
BC List	Blue
COSEWIC	Special Concern
SARA Schedule	Special Concern

### Range and Distribution



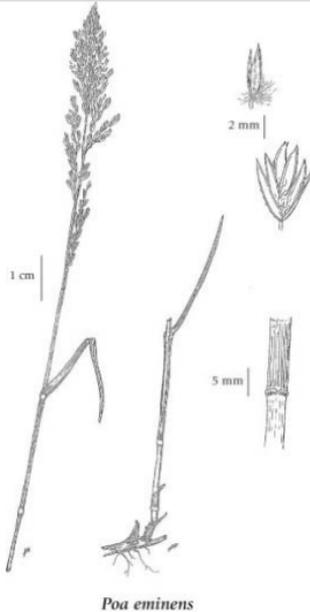
## **GRASSES, SEDGES, AND RUSHES**

The only grass species of concern is the Eminent Bluegrass. It inhabits the non-forested ocean shoreline; therefore, it need only to be considered when operations affect that area. This will primarily be during planning for a coastal log dump.

## EMINENT BLUEGRASS

*Poa eminens*

A tall perennial grass with broad leaves that have sharp edges and spear-like tips. It has large flowers. Stems are stout, 20-100 cm tall. The inflorescence is an erect panicle, 8-30 cm long. Leaf sheath margins open 1/6-1/4 their length; shoots if present are isolated, robust, often glaucous; blades 4-11 mm wide, flat, thick, smooth to slightly rough; ligules 1-3.5 mm long, yellowish-cream to brownish, the tips blunt, jagged, rough. If the soil around this grass is disturbed, the rhizomes spread vigorously, making it excellent for beach stabilization.



*Poa eminens*

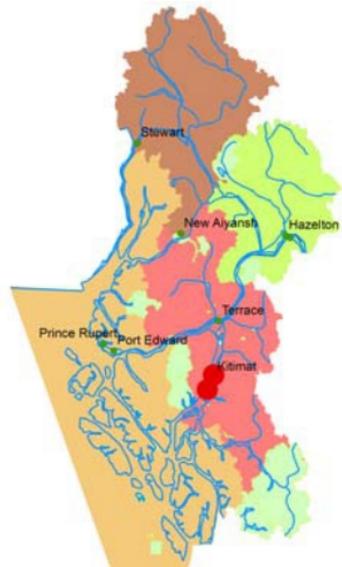
Source: *The Illustrated Flora of BC*

**HABITAT:** Inhabits coastal salt marshes and gravelly beaches in the lowland zone (CWHvm). Known in BC only from the mouth of Bish Creek in Douglas Channel and the Kildala River estuary near Kitimat. Seed is available from the Government of Alaska for use in revegetating shoreline areas in Alaska - this may be an option to consider in BC.

**BEC:** CWH

### CONSERVATION STATUS

Global	G5
BC	S1S2
BC List	Red
COSEWIC	Not assessed
SARA Schedule	N/A



Forest District: Kalam



**B.C. Conservation Data Centre  
FIELD SURVEY FORM (PLANTS)**

Note: Complete only for Red- or Blue-Listed species. Please fill out as many fields as you can, but precise locality and population data are especially important pieces of information.

Project name: _____
New/Update Update EO # _____

Species: \_\_\_\_\_  
Name of surveyor/Address/ phone #/Email: \_\_\_\_\_

Survey Date: (Month/Day/year): \_\_\_\_\_ 1<sup>st</sup> visit or repeat visit to this site: \_\_\_\_\_

Revisit needed?  yes  no Why?: \_\_\_\_\_

Specimen Collection # & Herbarium: (Please make a collection; in most cases, a collection is necessary to verify identification) \_\_\_\_\_ Was a photo taken? \_\_\_\_\_

Location/Directions: (Please be as precise as possible; include photocopies of 1:20,000 trim or 1:50,000 topographic maps (if possible, but any maps are welcome))

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Position:**

UTM grid reference: (from blue grid on 1:50,000 NTS map): \_\_\_\_\_ MAP SHEET# \_\_\_\_\_  
(North American Datum (NAD) designation is found below the contour interval scale on NTS map, 27 or 83; a GPS unit can be set to either NAD designation; We use NAD 83 data).

ZONE \_\_\_\_\_ EASTING \_\_\_\_\_ NORTHING \_\_\_\_\_ NAD \_\_\_\_\_

LATITUDE \_\_\_\_\_ LONGITUDE \_\_\_\_\_

Did you use a GPS unit to determine this value? Y / N Precision of point (+/- metres) \_\_\_\_\_

Habitat: (Please include dominant plants and identify plant communities, a general description of area including land forms/use)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Topographic features: Elevation: \_\_\_\_\_ metres feet (circle one) Slope: \_\_\_\_\_ Aspect: \_\_\_\_\_  
(Please note if elevation was derived from GPS unit)

- Light:**  
 open  
 partial  
 filtered  
 shade

- Slope Position:**  
 crest  
 upper slope  
 mid slope  
 lower slope  
 bottom

- Moisture:**  
 inundated  
 saturated (wet-mesic)  
 moist (mesic)  
 dry-mesic  
 dry (xeric)

**Population Data:**

Number of individuals: (estimate or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): \_\_\_\_\_

Number of sub-populations & separation distances (if applicable): \_\_\_\_\_

..... Also see Page 2

Area and units covered by population: Length: Width:  
(Please also indicate direction for length & width and reference to any landscape features, shape of areas & how areas relates to any UTM's provided, ie the centrum):

Confidence Extent: Full extent of population known Full extent not known Uncertain

Phenology: (Indicate the number observed in each category (or check if numbers are unknown):  
in leaf in bud in flower immature fruit mature fruit seed dispersing  
dormant seedlings

Area for sketch:

Rank Considerations:

Condition: An integrated measure of the quality of biotic and abiotic factors, structures and processes within the habitat the population occupies. Assesses how well this species is doing at this site.

Please consider;

- 1) reproduction and health
- 2) ecological processes
- 3) species composition and biological structure
- 4) habitat degradation, presence of exotic species and disturbance
- 5) physical/chemical factors that affect the element's ability- to persist at the site.

Landscape context: Factors, structures and processes at work over the landscape surrounding the population. Please consider:

- 1) the degree of fragmentation and connectivity of suitable habitat for this species
- 2) species composition
- 3) biological structure
- 4) ecological processes
- 5) abiotic factors

Notes: (Land ownership, development plans, management activities, if any, or other comments):

Private land owner may request that the exact location not be released to the public. The CDC will only release the location in response to an

FOI request. Does the landowner want the exact location withheld from the public? YES NO

Was the landowner contacted about the release of the exact location? YES NO

LANDOWNER'S NAME:

PHONE:

E-MAIL:

Please return to: BC Conservation Data Centre,  
P.O. Box 9358 station Provincial Government,  
Victoria BC V8W 9M2  
(fax: 250-357-2733)



**B.C. Conservation Data Centre  
FIELD OBSERVATION FORM (ANIMALS)**

Complete only for Red or Blue listed species. Complete as many fields as able, particularly ones denoting exact location.

SPECIES: \_\_\_\_\_  
 Name of recorder/reporter: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Phone#: \_\_\_\_\_ e-mail: \_\_\_\_\_

EO: Create \_\_\_\_\_  
 Update \_\_\_\_\_  
 EO #: \_\_\_\_\_  
 DONE: \_\_\_\_\_

**Location:** (We use the information you provide to map locations, and to relocate sites on the ground. Please be as precise as possible. Provide written directions below and sketch a map. A photocopy of a 1:50,000 topographic map or other showing the location would be appreciated).

UTM grid reference: (from blue grid on 1:50,000 NTS map) NTS MAPSHEET NO.: \_\_\_\_\_  
 Please note which North American Datum (NAD) was used (found below the contour interval scale on NTS map): 27 or 83  
 ZONE: (e.g. 10U) \_\_\_\_\_ NORTHING: \_\_\_\_\_ EASTING: \_\_\_\_\_ NAD: \_\_\_\_\_

Did you use a GPS unit to determine this UTM point? Y / N Precision of point: (+/- metres) \_\_\_\_\_

Date			Numbers						Comments	Observer
year	month	day	Adult			Immature				
			m	f	u	m	f	u		

**Evidence of breeding:**  none  mating observed  nest found  young being fed out of nest  
 singing/displaying male(s)  egg-laying observed  larva/pupa found  
 other: \_\_\_\_\_  
 Comments: \_\_\_\_\_

**Habitat:** (include dominant plants if possible; a general description of area): \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Elevation:** \_\_\_\_\_ metres feet (circle one) **Slope %:** \_\_\_\_\_ **Aspect:** \_\_\_\_\_

**Comments/Remarks:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

..... Also see Page 2

Area for sketch:

Size (square meters, kilometres or hectares): (area covered by the population).

Landscape context: 'Is the area fragmented?

General (Describe surrounding area and adjacent land uses including species composition and any other biological or abiotic factors that may affect the population):

Condition (Condition is a measure of the continued existence of the occurrence. Some factors to consider are: habitat degradation, disturbance and presence of exotic species):

Notes: Land ownership; development plans, management activities or recommendations, or any other comments:

Known threats:

Ownership/Jurisdiction:

=

A private land owner may request that the exact location not be released to the public. The CDC will only release the location in response to an FOI request

Does the landowner want the exact location withheld from the public? YES

NO

Was the landowner contacted about the release of the exact location? YES

NO

LANDOWNER'S NAME;

PHONE

Z-MAIL:

Please return forms to: Conservation Data Center

P.O. Box 935S Station Provincial Government

Victoria BC V8W 9M2

(FAX: 250-387-2733)

BRITISH COLUMBIA		GROUND INSPECTION FORM			
G <input type="checkbox"/> VG <input type="checkbox"/> V <input type="checkbox"/>		PHOTO		X:	Y: DATE
PROJECT ID.			SURV.		
MAP SHEET			PLOT #		POD# #
UTM ZONE		LAT. / NORTH		LONG. / EAST	
ASPECT				ELEVATION _____ m	
SLOPE		%	SMR	SNR	
MESO SLOPE POSITION		<input type="checkbox"/> Crest	<input type="checkbox"/> Upper slope	<input type="checkbox"/> Mid slope	<input type="checkbox"/> Lower slope
		<input type="checkbox"/> Depression	<input type="checkbox"/> Level	<input type="checkbox"/> Toe	
DRAINAGE - MINERAL SOILS		<input type="checkbox"/> Very rapidly	<input type="checkbox"/> Rapidly	<input type="checkbox"/> Well	<input type="checkbox"/> Mod. well
		<input type="checkbox"/> Imperfectly	<input type="checkbox"/> Poorly	<input type="checkbox"/> Very poorly	
MOISTURE SUBCLASSES - ORGANIC SOILS		<input type="checkbox"/> Aqueous	<input type="checkbox"/> Pseudogic	<input type="checkbox"/> Aquic	<input type="checkbox"/> Subaquic
		<input type="checkbox"/> Perhumid	<input type="checkbox"/> Humid		
MINERAL SOIL TEXTURE		<input type="checkbox"/> Sandy (LS, S)		<input type="checkbox"/> Silty (SL, SL)	
		<input type="checkbox"/> Loamy (SL, L, SCL, FSL)		<input type="checkbox"/> Clayey (SICL, CL, SC, SIC, C)	
ORGANIC SOIL TEXTURE			SURF. ORGANIC HORIZON THICKNESS		
<input type="checkbox"/> Fibric <input type="checkbox"/> Mesic <input type="checkbox"/> Humic			<input type="checkbox"/> 0-40 cm <input type="checkbox"/> > 40 cm		
HUMUS FORM			ROOT RESTRICTING LAYER		
<input type="checkbox"/> Mor <input type="checkbox"/> Moder <input type="checkbox"/> Mull			Depth _____ cm Type _____		
COARSE FRAGMENT CONTENT					
<input type="checkbox"/> < 20% <input type="checkbox"/> 20-35% <input type="checkbox"/> 35-70% <input type="checkbox"/> > 70%					
TERRAIN		COMPONENT: TC1 <input type="checkbox"/> TC2 <input type="checkbox"/> TC3 <input type="checkbox"/>			
TERRAIN TEXTURE		SURFICIAL MATERIAL		SURFACE EXPRESSION	
GEOMORPH PROCESS		1		1	
2		2		2	
ECOSYSTEM		COMPONENT: EC1 <input type="checkbox"/> EC2 <input type="checkbox"/> EC3 <input type="checkbox"/>			
BGC UNIT			ECOSECTION		
SITE SERIES			SITE MODIFIERS		
STRUCTURAL STAGE			CROWN CLOSURE _____ %		
ECOSYSTEM POLYGON SUMMARY			TERRAIN POLYGON SUMMARY		
	%	SS	SM	ST	Classification
EC1					TC1
EC2					TC2
EC3					TC3