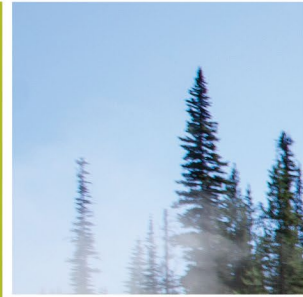




**BCTS**  
BC Timber Sales

# Species of Management Concern Awareness Training

BCTS Seaward (tlasta) April 2023; Revision: March 7, 2024 (see slide 23)



# SOMC Awareness Training Overview

BCTS Seaward (tlasta) April 2023

**BCTS**  
BC Timber Sales

- **Introduction:**
  - What are Species of Management Concern?
  - Why protect them?
- **Legislation** – Federal and Provincial
- SFI Certification
- Business Area (BA) SOMC Focus Species
- Reporting BCTS Seaward-tlasta SOMC focus species
- Identification Resources



# What are Species of Management Concern?

BCTS has both legal and stewardship obligations to manage and conserve specific species, ecosystems and habitats that might occur within BCTS operating areas and be adversely affected by forestry activities. These **species and ecosystems of management concern (SOMC)** are identified by a variety of sources, including provincial and federal legislation and policy; independent bodies such as the BC Conservation Data Centre (CDC) or the federal Committee on Status of Endangered Wildlife in Canada (COSEWIC); local resource management plans; and forest certification programs. Some of these species and ecosystems are considered at risk; others are not at risk but require special management for social and/or economic reasons.

# What are Species of Management Concern?



## **SOMC include the following:**

- Species and ecological communities that are designated as being at risk by federal or provincial agencies
  - Federal – included on Schedule 1 of the *Species at Risk Act* (only animal or plant species, not plant communities or ecosystems)
  - Provincial – included on the red or blue list (species and ecological communities)
- Species listed in specific regulations
  - *BC Wildlife Act*
  - FRPA – IWMS, GAR species (WHAs or UWR)
- SFI Certification – includes animals and plant species, plant communities and Forests with Exceptional Conservation Value(FECV) listed by NatureServe (Global) to be critically imperiled or imperiled.
- Some SOMC are not at risk but require special management for social and/or economic reasons.

# Why Protect SOMC ?

- The conservation of SOMC is a fundamental component of sustainable forest management, an overarching BCTS principle:
- To maintain biological diversity.
- To comply with federal legislation - *Species at Risk Act*, *Fisheries Act* and the *Migratory Birds Conventions Act*.
- To comply with provincial legislation – *BC Wildlife Act* and the *Forest and Range Practices Act*.
- To maintain Sustainable Forestry Initiative certification – BCTS is required to have a program to protect threatened and endangered species and ecosystems.



# Background Legislation / Policy Framework

- **Hierarchy of legislation**
- Highest:
  - Canadian Constitution
- Federal Acts/regs
- Provincial Acts/regs
- Lowest: Municipal (Common Law)
- Policy: for consistent application of regulation and Acts
- Provinces often mimic federal laws, e.g. MBCA and BC Wildlife Act

## Legislative Framework

Jurisdiction	Agency	Legislative Framework	Protection	Ranking
Global	NatureServe	Advisory		<ul style="list-style-type: none"> <li>• Global (G)</li> <li>• Provincial (S)</li> </ul>
Federal	Environment Canada	<ul style="list-style-type: none"> <li>• <i>Migratory Bird Convention Act</i></li> </ul>	<ul style="list-style-type: none"> <li>• Lists birds (and their nests) protected under the act</li> </ul>	
	COSEWIC	<ul style="list-style-type: none"> <li>• <i>Species at Risk Act (SARA)</i></li> </ul>	<ul style="list-style-type: none"> <li>• Status Reports</li> <li>• Recovery Strategies</li> <li>• Action Plans</li> <li>• Regional Implementation Groups (RIG)</li> </ul>	<ul style="list-style-type: none"> <li>• Extirpated</li> <li>• Endangered</li> <li>• Threatened</li> <li>• Special Concern</li> </ul>
Province of British Columbia	Conservation Data Centre	Advisory		<ul style="list-style-type: none"> <li>• Red-listed</li> <li>• Blue-listed</li> <li>• Yellow-listed</li> </ul>
	MoE	<ul style="list-style-type: none"> <li>• <i>Wildlife Act</i></li> <li>• <i>Wildlife Amendment Act</i></li> <li>• <i>Fish Protection Act (Riparian Areas Regulations)</i></li> </ul>	<ul style="list-style-type: none"> <li>• protection from being killed, wounded, hunted or transported</li> <li>• provides increased protection for species at risk - can legally designate species</li> </ul>	
	MoFR and MoE	<ul style="list-style-type: none"> <li>• <i>Forest and Range Practices Act (FRPA)</i></li> <li>• Section 7 Notices</li> </ul>	<ul style="list-style-type: none"> <li>• Identified Wildlife Management Strategy (IWMS)</li> <li>• Wildlife Habitat Areas (WHA)</li> <li>• Ungulate Winter Ranges (UWR)</li> <li>• General Wildlife Measures (GWM)</li> <li>• Higher Level Plans (HLP)</li> </ul>	

# Federal Legislation

Federal Legislation	Protection	What does it apply to?	Where does it apply?
<p><i>Species at Risk Act</i></p>	<ul style="list-style-type: none"> <li>The legislation that legally assigns the national biological conservation status of species based on advice of <b>COSEWIC</b></li> <li>Provides legal protection of species listed in Schedule 1, their residences and critical habitat if located on federal land.</li> <li>Critical habitat is designated for species listed as Endangered or Threatened</li> </ul>	<ul style="list-style-type: none"> <li>Applies to species listed in Schedule 1 as Endangered, Threatened and Special Concern</li> <li>Currently SARA only includes species and does not include ecological communities</li> </ul>	<ul style="list-style-type: none"> <li>Aquatic species and migratory birds – everywhere</li> <li>All other species – federal lands only unless provincial response is seen to be inadequate.</li> </ul>
<p><i>Migratory Birds Convention Act</i></p>	<ul style="list-style-type: none"> <li>Designates the migratory birds that the Act applies to:</li> <li>Protects migratory birds and their nests when they contain a live bird or a viable egg</li> <li>The new Migratory Birds Regulations (2022) includes a list of 18 species whose nests are reused and are protected year-round, unless they have been shown to be abandoned</li> </ul>	<ul style="list-style-type: none"> <li>Applies to migratory birds identified under the Act</li> <li>Some examples of groups it does not apply to are owls, jays, crows, ravens, hawks and eagles (but is covered under the BC Wildlife Act).</li> <li>The nests of the 18 species identified in Schedule 1 of the MBR are protected year-round</li> </ul>	<ul style="list-style-type: none"> <li>Applies on all lands, tenures, freshwater and ocean waters in Canada</li> </ul>

# Provincial Legislation

Provincial Legislation	Protection	What does it apply to?	Where does it apply?
<b>Wildlife Act</b>	<ul style="list-style-type: none"> <li>Prohibits the hunting, trapping, wounding of endangered or threatened species and all native wildlife species (S.26)</li> <li>Protects a bird or its egg, the nest of an eagle, peregrine falcon, gyrfalcon, osprey, heron or burrowing owl or the nest of a bird not referred to when the nest it occupied by a bird or its egg (S.34)</li> </ul>	<ul style="list-style-type: none"> <li>All native species.</li> <li>Designated endangered or threatened species (S.13) include Burrowing Owl, Sea Otter, Vancouver Island Marmot, American White Pelican</li> <li>Nests of eagles, peregrine falcons, osprey, herons or burrowing owls</li> <li>Active nests of all bird species</li> </ul>	Everywhere in BC
<b>Forest and Range Practices Act</b>	<ul style="list-style-type: none"> <li>Section 7 Notices are objectives set by government for consideration during forestry planning (result or strategy in FSP)</li> </ul>	<ul style="list-style-type: none"> <li>Provincially designated species at risk</li> <li>Regionally important wildlife (none currently identified)</li> <li>Winter survival of specified ungulate species (GAR S.12)</li> </ul>	Provincial Crown Land
<b>Identified Wildlife Management Strategy supported by the Government Actions Regulation</b>	<ul style="list-style-type: none"> <li>IWMS (2004) is policy used to establish Wildlife Habitat Areas (GAR S.10) and the implementation of general wildlife measures (GAR S.9) for species designated as identified wildlife that are affected by forest or range operations</li> </ul>	<ul style="list-style-type: none"> <li>Identified Wildlife = Species at Risk and Regionally Important Wildlife</li> <li>Includes plant communities</li> </ul>	Provincial Crown Land
<b>Government Actions Regulation</b>	<ul style="list-style-type: none"> <li>Identify wildlife habitat features (GAR S.11) such as a fisheries sensitive feature, a marine sensitive feature, as significant mineral lick or wallow, the nest of a bald eagle, osprey, great blue heron or a category of species at risk that is limited to birds, any other localized feature.</li> </ul>	<ul style="list-style-type: none"> <li>Various species</li> <li>Specifically named species in GAR S.11(d) include bald eagle, osprey, great blue heron</li> <li>Currently only designated in the Kootenay Boundary region</li> </ul>	Provincial Crown Land



# Provincial Legislation – Timber Supply Areas

Provincial Legislation	Timber Supply Area
<p><i>Forest and Range Practices Act (FRPA)</i></p>	<ul style="list-style-type: none"> <li>Individual species of concern management plans are communicated to applicable tenure holders through IWMS Section 7 notices (authorized under the FPPR).</li> <li>The Notice may include specified areas (UWR, WHA) and Schedule 1 General Wildlife Measures (GWMs) as well as other information supporting the notice after the original Notice.</li> </ul>
<p><b>Identified Wildlife Management Strategy (IWMS) supported by the Government Actions Regulation</b></p>	<ul style="list-style-type: none"> <li>IWMS provides direction, policy, procedures and Guidelines for managing Identified Wildlife and includes management of requirements listed under the Section 7 notices for the North Island and Central Coast</li> <li>Unless otherwise specified, IWMS applies to all provincial crown land (e.g., Forest License, TFL)</li> </ul>
<p><i>Government Actions Regulation (GAR)</i></p>	<ul style="list-style-type: none"> <li>The S.7 Notice is authorized under GAR.</li> <li>GAR is also used to grandparent specified areas and GWMs from the Forest Practices Code era and to amend specified areas and GWMs</li> </ul>

- Under **higher level plans**
- e.g., Haida Gwaii Land Use Order; GBRO (GBR North and GBR South),
- extra animal and plant species, or ecosystems (plant communities) may have additional management criteria.

# SOMC Ranking

<b>Provincial Rankings</b> BC Conservation Data Centre (CDC)	<b>Federal Rankings</b> Committee on the Status of Endangered Wildlife in Canada (COSEWIC)	<b>Global Rankings</b> Global (G), Provincial (S) (NatureServe)
<p><b>Red</b></p> <p><i>Facing imminent extirpation or extinction (endangered). Likely to become endangered if limiting factors are not reversed (threatened).</i></p>	<p><b>Extirpated</b></p> <p><b>Endangered</b></p> <p><i>Facing imminent extirpation or extinction</i></p> <p><b>Threatened</b></p> <p><i>Likely to become endangered if limiting factors are not reversed</i></p>	<p><b>GH, SH</b></p> <p><i>Possibly extinct</i></p> <p><b>G1, S1</b></p> <p><i>Critically imperiled</i></p> <p><b>G2, S2</b></p> <p><i>Imperiled</i></p>
<p><b>Blue</b></p> <p><i>Characteristics that make them particularly sensitive or vulnerable to human activities or natural events.</i></p>	<p><b>Special Concern</b></p> <p><i>Characteristics that make it particularly sensitive to human activities or natural events</i></p>	<p><b>G3, S3</b></p> <p><i>Vulnerable to extirpation or extinction</i></p>
<p><b>Yellow</b></p> <p><i>Secure and not at risk of extinction</i></p>	<p><b>Not at Risk</b></p>	<p><b>G4, G5, S4, S5</b></p> <p><i>Widespread, abundant, secure</i></p>

# Sustainable Forestry Initiative

BC Timber Sales is certified under the Sustainable Forestry Initiative (SFI) Forest Management Standard (2022)

## **Objective 4 . Conservation of Biological Diversity**

Performance Measure 4.2: *Certified Organizations shall protect threatened and endangered species, critically imperiled and imperiled species (Forests with Exceptional Conservation Values), and natural communities and old-growth forests.*

- Indicator 4.2.1: *Program to protect threatened and endangered species.*
- Indicator 4.2.2: *Program to locate and protect known sites of flora and fauna associated with viable occurrences of critically imperiled and imperiled species and ecological communities, defined as Forests with Exceptional Conservation Value.*



▪ **Coarse Filter Resources available:**

- GIS e.g., Habitat Suitability Inventories (e.g., NOGO habitat , UWR habitat), CDC
- Nest site reporting (licensees, environment branch)
- Habitat Wizard
- Google Earth, air photos
- Annual reporting,
- Marine HVFH layer,
- LiDAR: slope, stream gradient, diverging streams, fans, alluvial, semi alluvial, non-alluvial estimates, Bear den focus areas
- Habitat modelling

## ▪ **Fine Filter:**

- Nest surveys (NOGO, Screech owl, Pygmy owl, Bald Eagle, Sandhill Crane)
- RRZ, RMZ measurements, stream assessments (fish, Tailed-frog, Western Water Shrew),
- Western Toad and Red-legged Frog assessments
- Bear Den assessments or findings, Wildlife Danger tree assessments, Wind throw assessments
- Final block configuration → Wildlife tree retention area (WTRA), safety reserves
- Stream classification (Alluvial, semi-alluvial, non-alluvial) confirmation
- Fan confirmation, stable fan identification






*Gillette's Checkerspot*

Record relevant information of BCTS Seaward-tlasta Business Area Focus Species.

The BCTS SoMC Field Observation Form (SoMC SOP Appendix 5) is available as a reference for data collection purposes (use is optional).

- Record the location on a map, GPS or iPad
- Take photos and video if possible.
- General description of the habitat, including stand age and structure.
- Note any special features such as amount of coarse woody debris and wildlife trees.
- Record the elevation and slope of the site.

**Coastal Tailed Frog (*Ascaphus truei*)** 

Phenology:

Season		Habitat	
Jan	Feb	Mar	Apr

**Habitat:**

- Clear, cold swift-moving stable mountain streams with coarse substrates. Primarily in older forest sites or advanced second growth.
- Streams must have forested borders, have a bed of boulders and/or cobbles and remain ice-free during the winter.
- Habitats usually have a large amount of coarse woody debris.
- Elevations: 0-2140 m.
- Adults rarely venture more than 30m from the stream.
- May be found on land during wet weather near water in humid forests or in more open habitat.
- During dry weather stays on moist streambanks
- Sediment introduction is the biggest threat.

**Field Guidance:**

- If Tailed Frogs or tadpoles are observed or suspected, limit activity in the immediate area.
- Take photos and record sighting's coordinates.
- Report the observation to supervisor and contact BCTS.




Photo Credit: A. McEwan, E-Plexa BC

**Business Area Management Recommendations:**

**Recommendations:**

- Refer to BCTS Seaward/In-situ Species of Management Concern Standard Operating Procedure (2023) and follow the steps outlined.
- If deemed necessary by BCTS, contact a QRP if you are uncertain about occupancy.

**Status:**

- SARA Schedule: 1-Special Concern (2003)
- Provincial List: Yellow
- Identified Wildlife: Yes

**Legal Reference**

- It is an offence to wound or kill wildlife unless subject to a hunting license (Wildlife Act).
- Minimum Legal Buffer: N/A
- Not a comprehensive list of all legal requirements.

**Range:**

- Found in the Coast and Cascade Mountain Ranges in BC, from the Lower Mainland to the Nass River.
- South to northern California and north to the Alaskan panhandle.
- Not found on Vancouver Island; however, are present on the mid- and northern coast of British Columbia.




Photo Credit: Naturalist

BCTS Seaward (In-situ) December 2023

**Field Card (Coastal Tailed Frog)**

## Field Guidance (example):

- If Tailed Frogs or tadpoles are observed or suspected, limit activity in the immediate area.
- Take photos and record sighting's coordinates.
- Report the observation to supervisor and contact BCTS.

## Business Area Management Recommendations:

- Refer to BCTS Seaward/In-situ Species of Management Concern Standard Operating Procedure (2023) and follow the steps outlined.
- If deemed necessary by BCTS, contact a QRP if you are uncertain about occupancy.





## **Do not handle wildlife!**

**We don't want to cause any harm to wildlife, and we don't want to expose staff to any danger**

- take photos or videos to confirm species ID from a safe distance
- If these methods are not adequate to confirm species identification and a SOMC is suspected, then consult with BCTS Practices Forester if a qualified biologist should be contacted to conduct a follow up survey.

# Handling Wildlife - Amphibians



If handling amphibians to identify the species

- use clean wet hands free of chemicals such as sunscreen or insecticides and wear disposable gloves if possible.
- Minimize the handling time to reduce stress.
- Don't handle amphibian egg masses. Observe them and provide photos and approximate measurements of their size for species confirmation.
- Risk of chytrid fungus and ranavirus → emerging infectious diseases are one of the leading causes of amphibian declines worldwide. Humans can act as vectors in transmitting these diseases, so handling of amphibians should only be done when necessary.



## **Never handle any bats of any species!**

Although the risk of contracting rabies from bats is rare, it is a very serious disease.

- If you have been in physical contact with a bat:
  - Notify your supervisor,
  - Contact your health care provider,
  - And get a rabies vaccination as soon as possible.
- 
- Bat species identification in the field should only be done by a qualified biologist! It isn't easy and for most species requires handling the bat.

# Handling Wildlife – sick or injured wildlife



If staff are able to catch wildlife, it likely means they are sick or injured, (other than amphibians)!

- **Never pick up a sick or dead animal of any species with bare hands; use gloves or a shovel!**
- If you find a sick or injured wildlife, do not transport it! **Call the Conservation Officer Services 1-877-952-7277** to report it!
- Additional resources:
- There is a provincial website on what to do if you find sick, injured or dead wildlife: [What to do if you find sick, injured, or dead wildlife - Province of British Columbia \(gov.bc.ca\)](#)
- **MARS Wildlife Rescue (250) 337-2021**




# Handling Wildlife – bear dens



- Use caution if approaching a suspected bear den during the winter hibernation period for personal safety and to avoid disturbing a hibernating animal.
- Assessment of a bear den during the winter should only be done if absolutely necessary.
- Take Bear Aware Training

For additional information, consult the [BCTS Sustainability Intranet](#) page where you will find the BCTS corporate SOMC resources.

## Species ID Resources

- [Regional Amphibian ID Keys](#) – ID keys for frogs, toads and salamanders
- [BC Species and Ecosystems Explorer](#) – data about species and ecosystems in BC
-  [iNaturalist](#) – identification tool for plants and animals
-  [Seek](#) – developed by iNaturalist, will work without internet connection
-  [Merlin Bird ID](#) – bird identification by sight and sound



# BCTS Seaward-tlasta Species of Management Concern Focus Species

*Revision: Update March 7, 2024. -- The **Pileated Woodpecker (*Dryocopus pileatus*)**, is a migratory bird that has been added as a Seaward Focus Species, and it will be integrated into future versions of this powerpoint. Other BCTS SoMC materials such as the Operator Awareness Sheet and Migratory Bird & Breeding Bird handouts and Appendix 2a Birds lists have been updated to include this species (Dec 2023).*

# Black Bear (*Ursus americanus*)



**BCTS**  
BC Timber Sales

## Description:

- **Not always black**, can be cinnamon, brown, and blonde.
- Small black eyes, broad head, rounded ears, short tail, fine, long fur.
- Prominent **shoulder hump of grizzlies is absent** and facial profile is straight rather than dish-shaped and claws are shorter
- **Size and weight, varies greatly** by sex, season, food supply, and locale.
- **Adult males** 60-90 cm at shoulder, 30-190 cm long and weigh 80-300 kg.
- **Females** smaller at 40-140 kg.



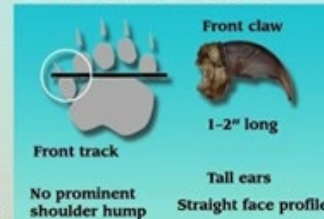
## Biology:

- **Mate** early Jun–mid Jul but **embryo does not implant until Oct–Nov.**
- **Cubs born Jan–Feb during hibernation** weighing about 400 g.
- **Nurse** while mother hibernates.
- Cubs stay with mother for first year.
- Hibernation is **3-5 months on south coast; 5-7 months** in interior and north.

## Phenology:

Hibernate											Hibernate	
Birth		Nursing		Fertilization		Implantation						
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	

## Black Bear



## Grizzly Bear



**Color and Size can be misleading.**  
Look for a combination of characteristics.



# Black Bear (*Ursus americanus*)



**BCTS**  
BC Timber Sales

## Habitat:

- **Forested and shrubby areas to open** but use wet meadows, high tidelands, ridgetops, burned areas, riparian areas, and avalanche chutes.
- **Coastal dens** in or under large trees, snags, logs, or stumps.
- **Interior dens** in tree cavities, but can den in rock cavities, under-brush piles, or in holes dug into ground.

## Range:

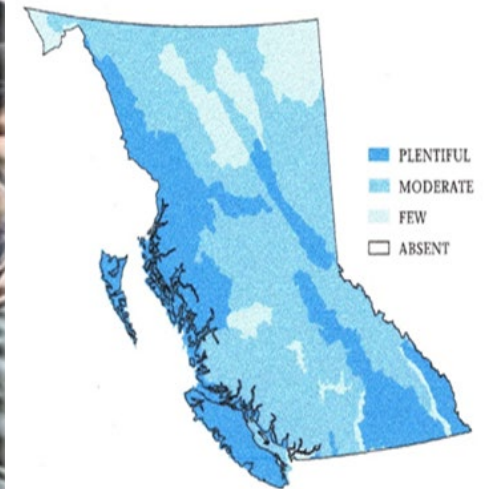
- Most of BC.

Opening to bear den under tree root



## Resources:

Coastal Bear Den Identification Manual, 2021. Helen Davis (Artemis Wildlife Consultants)  
[http://artemiswildlife.com/AWC\\_Bear\\_Den\\_ID\\_manual\\_v2.pdf](http://artemiswildlife.com/AWC_Bear_Den_ID_manual_v2.pdf)



# Grizzly Bear (*Ursus arctos*)



**BCTS**  
BC Timber Sales

## Description:

- **Brownish to yellowish coat.** Varies: almost entirely black to almost white often white-tipped guard hairs.
- **Concave face** with small eyes (in relation to head) and rounded ears.
- **Large hump** on the front shoulders.
- Large flat paws are equipped with long (5cm) claws.
- Solitary animals except during the fall salmon runs.



## Biology:

- **Mate** late May-Jun but **embryo does not implant until Nov-Dec.**
- **Cubs born Mar during hibernation** weighing about 400 g.
- **Nurse** while mother hibernates.
- **Cubs** stay with mother for first year.
- **Dens** can be excavated underground, in trees and rock caves.

## Phenology:

Hibernate											Hibernate	
		Birth	Nurse	Fertilization							Implantation	
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	

### Black Bear

Front track

No prominent shoulder hump

Short claws

### Grizzly Bear

Front track

Shoulder hump

Long claws

Front claw

1-2" long

Tall ears

Straight face profile

Front claw

2-4" long

Short rounded ears

Dished face profile

**Color and Size can be misleading.**  
Look for a combination of characteristics.

# Grizzly Bear (*Ursus arctos*)



**BCTS**  
BC Timber Sales

## Habitat:

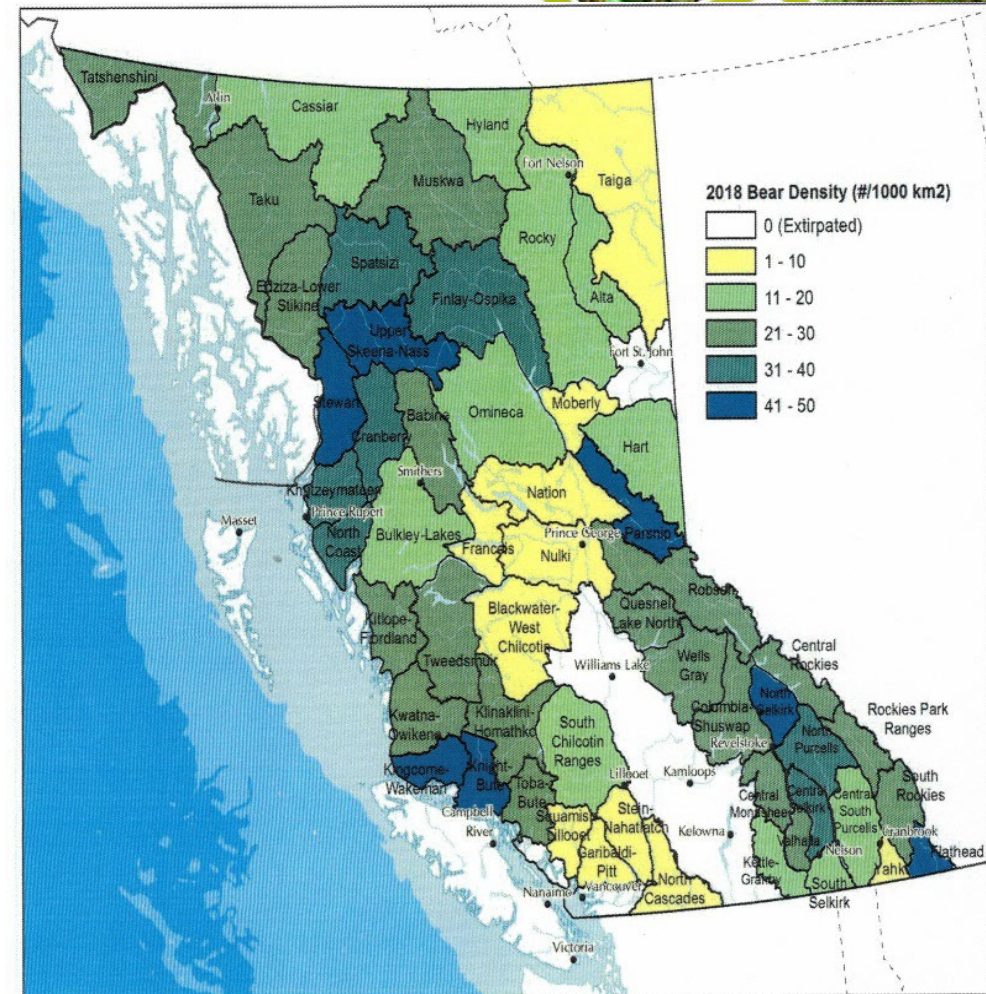
- **Alpine to valley bottoms**, common in higher elevation meadows and avalanche chutes.
- Avalanche tracks provide **spring foraging** opportunities.
- **Dens** usually on steep north-facing slopes, with soils suitable for digging in rare cases vegetation will stabilize the roof of the den.

## Range:

- Most of **BC** except some of the coast islands near coastal mainland.
- **Note:** Although there are areas where the bears are thought to be extirpated, these areas may still be used.
- On occasion, male solitary Grizzly Bears have been observed on **Vancouver Island and on Gilford Island.**

## Resources:

Coastal Bear Den Identification Manual, 2021. Helen Davis (Artemis Wildlife Consultants)  
[http://artemiswildlife.com/AWC\\_Bear\\_Den\\_ID\\_manual\\_v2.pdf](http://artemiswildlife.com/AWC_Bear_Den_ID_manual_v2.pdf)



# Little Brown Myotis (*Myotis lucifugus*)



**BCTS**  
BC Timber Sales

## Description:

- **Wingspan** 22-27 cm, **forearm** 33-41 mm, **body mass** 7-9 g.
- **Females** slightly larger than males.
- **Fur**: cinnamon buff to dark brown on back and may be glossy and slightly paler on belly.
- Wings and tail **lack fur** and are dark brown.
- **Ears are large** compared to size of head.
- Summer, males largely **solitary**, and females form **colonies**. and maternal roosts in the summer (Adult females and young of year)

## Biology:

- Breed during fall (**Sep, Oct**), fertilization after hibernation (**Feb, Mar**).
- Young born **May-Jul**, fly within 3 weeks and are independent after a month.
- **Migrate 50-200 km** between hibernacula and summer roosts.

## Phenology:

		Implant	Birth		Copulate						
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec



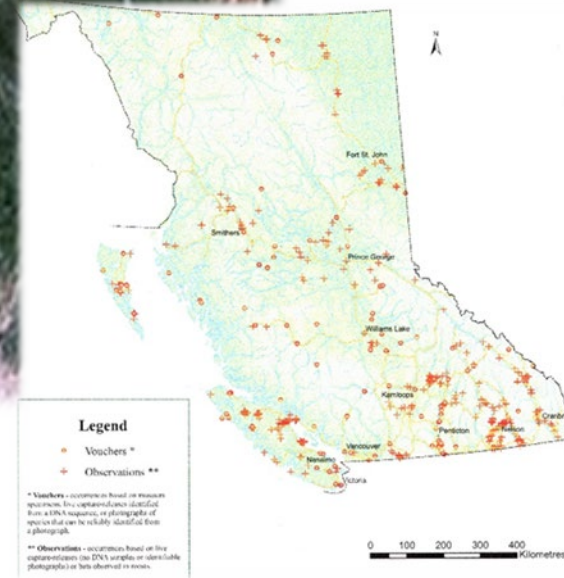
# Little Brown Myotis (*Myotis lucifugus*)



**BCTS**  
BC Timber Sales

## Habitat:

- **Dry open forests as well as wet riparian areas**, low elevation IDF up to 2300 m.
- **Roost sites** preferably on south to southeast aspects.
- **Summer:** in attics, under bridges, in hollow trees, under loose bark or shingles, or in rock crevices.
- **Require open water nearby.** May concentrate at pools and streams to drink at dusk.



## Range:

- **Forested habitats throughout BC** including Haida Gwaii and Vancouver Island.

# Vancouver Island Marmot (*Marmota vancouverensis*)



**BCTS**  
BC Timber Sales

## Description:

- Rich **chocolate brown coat** with contrasting white fur patches on nose, chin, forehead, and chest.
- **Pups** have uniformly dark, almost black, coat.
- **Size of large house cat** or small dog.
- 65-70 cm from to tip of bushy tail. **Weight** varies seasonally, **female** 3 kg (after hibernation) to 4.5-5.5 kg at hibernation onset.
- **Males** up to 7 kg.

## Biology:

- **Mate**, during first 3 weeks after spring emergence (**late Apr-early May**).
- Young born in burrows and appear above ground in **late Jun-Jul**.
- **Active** morning and evening.
- Hibernates, early **Oct-early May**. May lose one third of body weight.

## Phenology:

Hibernate									Hibernate		
			Mate	Birth							
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec



## Vancouver Island Marmot (*Marmota vancouverensis*)



**BCTS**  
BC Timber Sales

### Habitat:

- Suitable habitat is **scarce and highly fragmented**.
- **Open subalpine meadows**, on south to west-facing treeless slopes at 1000-1500 m.
- Sufficient **soil for burrowing**, with large rocks or stumps for lookouts.
- Burrows usually below rocks in or near meadows with 35-45 cm diameter entrance.

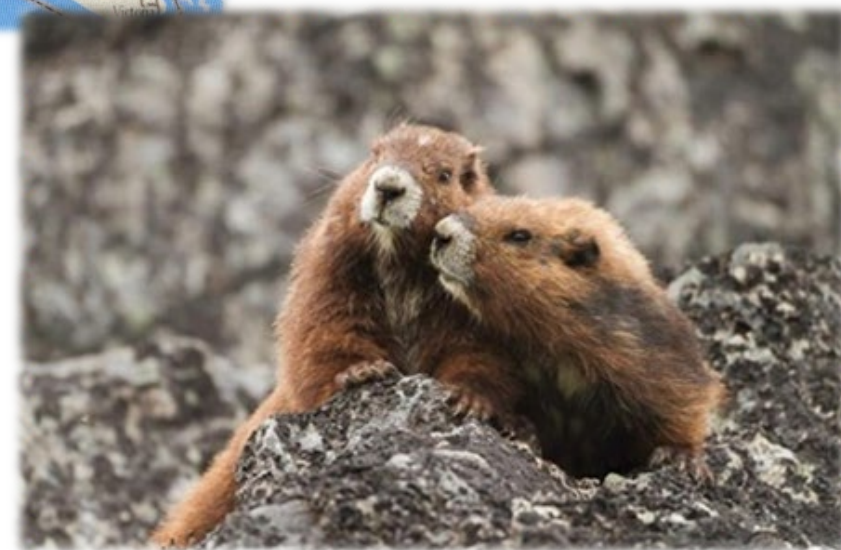


### Range:

- **Restricted** to mountains in the **Nanaimo Lakes area, and Mount Washington**.
- **Previously** more widespread.

### BEC Zones

- CMA, MH.



Hibernate									Hibernate		
			Mate	Birth							
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

# Mountain Goat (*Oreamnos americanus*)



**BCTS**  
BC Timber Sales

## Description:

- Stocky body, **hump above shoulder**, thin neck, sharply pointed, thin black horns, and long, narrow pointed ears.
- Hooves** not concave on underside, have a thick, soft, rough-textured pad extending to the edge of the keratin hoof.
- Coat** completely white or yellowish white. .
- Nose, horns, hooves, and dew claws are **black**.
- Both sexes** have beard on the chin and short mane.
- Short horns**, 200-280 mm, that are never shed.
- Adult **weights**, males 70-120 kg and females 55-75 kg.

## Biology:

- Rut** Nov-Dec.
- 1 or 2 (rare) kids born late **May-early Jun**, weigh 2-3 kg.
- Adult females** and young may be in small summer groups. Male are solitary but join females in fall.
- Additional minerals from **mineral licks**.

## Phenology:

				Birth				Wean	Mate		
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec





# Mountain Goat (*Oreamnos americanus*)



**BCTS**  
BC Timber Sales

## Habitat:

- **Alpine and subalpine.** Steep grassy talus slopes, grassy cliff ledges, alpine meadows at timberline or above.
- Shelter and food in stands of spruce or hemlock in **winter**.
- **Migrate** up and down mountains between summer and winter areas.
- Suitable **escape terrain** is a limiting habitat factor.
- Obtain needed elements from **mineral licks**.
- **Winter range**, steep sites on warm south to west exposure.



## Range:

- Widespread in BC.
- All **major mountain systems** of mainland BC.
- Absent from Vancouver Island and Haida Gwaii, Interior Plateau and Peace River Lowlands.



# Western Water Shrew (*Sorex navigator brooksi*)



**BCTS**  
BC Timber Sales

## Description:

- Subspecies **endemic to Vancouver Island**.
- Large shrew, **weight** 10.6 grams **Length** 15.2 cm includes 7.5 cm tail.
- Dense fur**, black on top, white or brown below, resists water penetration and traps air. Bicolored tail – dark above, white-silver below.
- Toes have fringe of **stiff interlocking hairs**, which enlarge the foot's effective surface.
- Adaptation allows animal to **run on water** for short distances.

## Biology:

- Little known of **reproductive biology**, using **common water shrew**.
- Breed**, Mar to Sep. Females pregnant or with young **May – Sep**.
- 2 or 3 **litters** per season.
- Active** hour before dawn and hour after dusk.

## Phenology (based on Common Water Shrew):

		Breeding Period									
				Birth	Care	Birth	Care	Birth	Care		
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec



## Western Water Shrew (*Sorex navigator brooksi*)



**BCTS**  
BC Timber Sales

### Habitat:

- **Riparian habitat** found over large part of **Vancouver Island**.
- **Diverse range of stream habitats:** narrow to wide, slow-moving to moderately fast flowing waters.
- **Substrate** of the streambed is usually cobbles or gravel.
- **Instream** CWD, and dense riparian vegetation (shrubs and herbs).
- Long, linear strip along water's edge.
- Forest **age does not reflect habitat** quality.
- **Low elevation** (sea level-560 m), variety of forest types and age classes,.

### Range:

- **Vancouver Island** as far west as Ucluelet, and 2 historical records from north Island near Quatsino Sound.
- **Most captures**, southern and eastern parts of Vancouver Island.
- Distribution likely reflects sampling rather than actual species distribution.

### BEC Zones

- CDF, CWH.



# Northern Red-legged Frog (*Rana aurora*)



**BCTS**  
BC Timber Sales

## Description:

- **Brown to reddish or copper-brown** colour with **black spots scattered over its back**.
- **Underbelly** of the species is **whitish**, with a **reddish colouration** on the lower belly and undersides of the hind legs as the frog gets older.
- Bones on the undersides of the hind legs can be seen through the translucent skin.
- This species has a **dark eye mask** above a narrow, cream-coloured **jaw stripe** on each side of the face.
- Tadpoles are **tan or olive** coloured with gold specks.
- **Eggs** are large, gelatinous, grapefruit- to **cantaloupe-sized mass**.

## Biology:

- Northern Red-legged Frogs reach sexual **maturity at 3+ years**.
- They are **explosive breeders**, with reproduction occurring for only a short period in early spring (e.g., 2-4 weeks).

## Phenology:

Breeding (Eggs)												
Eggs Hatch (Tadpoles)												
		Toadlets										
Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	



# Northern Red-legged Frog (*Rana aurora*)



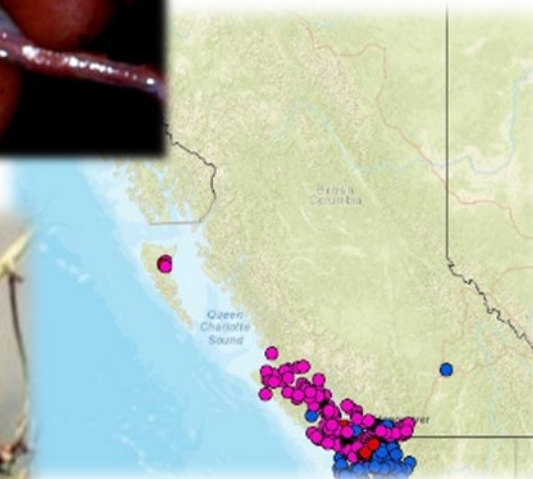
**BCTS**  
BC Timber Sales

## Habitat:

- Terrestrial stages of the Red-legged Frog are most typically found at lower elevations, below 200 m, but have been recorded at over 1000 m.
- It is associated with **streams, ponds, or marshes and ditches** but may also be found far from water in **moist forests**.
- Wetlands or ponds with a **water depth of 0.5-2 m** are required for **breeding**.

## Range:

- Range extends **Haida Gwaii to southwestern BC**, including Vancouver Island.



# Coastal Tailed Frog (*Ascaphus truei*)



**BCTS**  
BC Timber Sales

## Description:

- Coastal Tailed Frogs are small (40-50 mm snout-vent length) with a **large head**.
- The eyes of juveniles and adults have **vertical pupils**.
- **Adult males possess a short, cone-shaped "tail,"** which functions as a copulatory organ during mating.
- Tadpoles have a flattened **oral disc** that produces a **sucker-like mouth**, which they use to attach to rocks in fast flowing water. The body is dorso-ventrally flattened, and the tail fin is low.
- The Coastal Tailed Frog and Rocky Mountain Tailed Frog (*Ascaphus montanus*) were formerly considered as single species (*A. truei*) but are now recognized as two species based on genetic and ecological differences.

## Biology:

- Breeds in the fall with females laying 35 to 100 clear eggs in midsummer in small clusters attached to the undersides of rocks.
- **Larval period lasts 2-4 years.**

## Phenology:

										Breeding		
Metamorphose			Eggs		Hatch							
Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	



## Coastal Tailed Frog (*Ascaphus truei*)



**BCTS**  
BC Timber Sales

### Habitat:

- **Clear, cold swift-moving** mountain streams with coarse substrates. Primarily in **older forest sites**.
- May be found on land during wet weather near water in humid forests or in more open habitat.
- During dry weather stays on moist streambanks.

### Range:

- Found in the **Coast and Cascade Mountain Ranges** in BC, from the Lower Mainland to the Nass River.
- South to northern California and north to the Alaskan panhandle.



# Western Toad (*Anaxyrus boreas*)



## Description:

- Skin is **dry granular with bumpy warts**, colouration can be light to dark green to **brown or even reddish**.
- Distinguished by cream-coloured or white **vertebral stripe** running down the length of the back.
- Oval-shaped parotid glands, **horizontal pupils**.
- Underside is pale and coarsely mottled.
- Hind feet have two horny nodules** for digging.
- Females, up to 125mm, are slightly larger than males, up to 110mm, total length.

## Biology:

- Hibernate during winter, **the length of hibernation depending on the climatic and seasonal conditions**. Typically, between late September and March or April.
- Hibernation is below the frost line in small mammal burrows, crevices, and can be in easily excavated substrate, such as mud and sand.
- Breeding** takes place in **shallow water of ponds and lakes**.



## Phenology:

Hibernation			Breeding						Hibernation		
Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec



# Western Toad (*Anaxyrus boreas*)



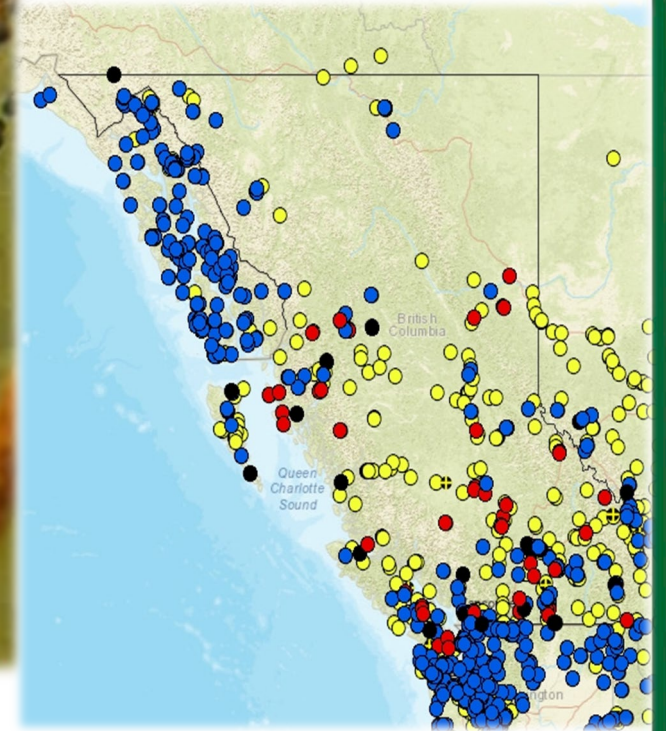
**BCTS**  
BC Timber Sales

## Habitat:

- Western Toads are found in **forest, wetlands, grassland, meadows, shrub lands, or subalpine or alpine meadows and dry habitats.**
- Usually not far from water.
- Can be found **thermoregulating** in open areas, but also **under structures for protection.**

## Range:

- Western Toads are **found throughout British Columbia.**
- Found from low to high elevations.
- Current inventory data is lacking for the far Northeast corner of British Columbia.



# Bald Eagle (*Haliaeetus leucocephalus*)



**BCTS**  
BC Timber Sales

## Description:

- Large **powerful raptor**.
- Characterized by the **white head and tail at maturity**.
- **Adults have black body** that contrasts with the white head and tail.
- Can reach one meter tall at maturity.
- Wingspan of two meters.
- Large yellow bill.
- **Female is larger than male**.
- **Immature** eagles are **mostly dark for one to two years** before white begins to appear.

## Biology:

- Eagles **mate for life but** will mate again if one mate dies.
- **Nests are large stick structures**, usually constructed on the top of large trees.
- There may be one or two alternate nests in the breeding territory.

## Phenology:

			Breeding	Parental Care							
Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec



# Bald Eagle (*Haliaeetus leucocephalus*)



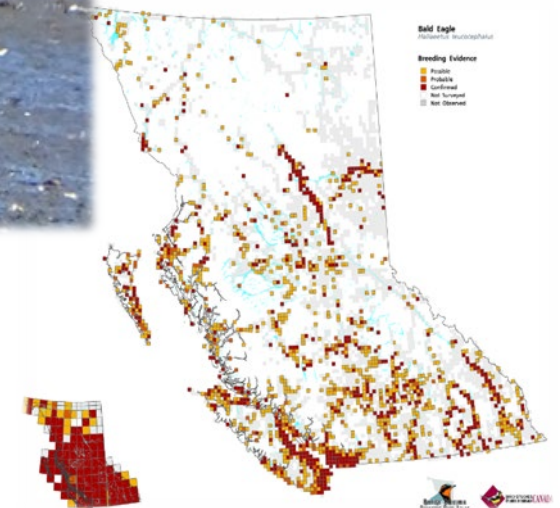
**BCTS**  
BC Timber Sales

## Habitat:

- **Forested, riparian, marine and grassland** habitats throughout British Columbia.
- Nesting and foraging activities are **common near water**.
- Higher populations occur near the Pacific Region near fjords, and estuaries.
- Some inland populations migrate to the Pacific Regions after freeze up.
- Prefer forested shorelines and waterways, lakes.

## Range:

- Bald Eagle is **found throughout British Columbia**, from valley bottoms to high elevations.
- Majority of birds are **concentrated along the coast and inland stream** habitats.
- During winter the Eagle population increases significantly in the Salish Sea (~70% of all west coast population) as the northern and interior eagles migrate to the Salish Sea.



# Barn Swallow (*Hirundo rustica*)



**BCTS**  
BC Timber Sales

## Description:

- **Medium sized songbird**, about the size of a sparrow, 15-18cm length, 29-32cm wingspan.
- **Back and tail distinctive iridescent blue**, light brown or rust stomach, chestnut coloured throat and forehead.
- Distinctive **long forked tail** and pointed wings.
- Streamlined bodies, for acrobatic flight.

## Biology:

- **Aerial insectivore.**
- Diet consists of feeding on **beetles, bees, wasps, ants, butterflies, moths, and other flying insects.**
- Usually take relatively large, single insects rather than feeding on swarms of smaller prey.
- **Mud Nests in barns or other buildings, under bridges, in caves or cliff crevices.**

## Phenology:

			Breeding, Fledging, Parental Care								
Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec



# Barn Swallow (*Hirundo rustica*)



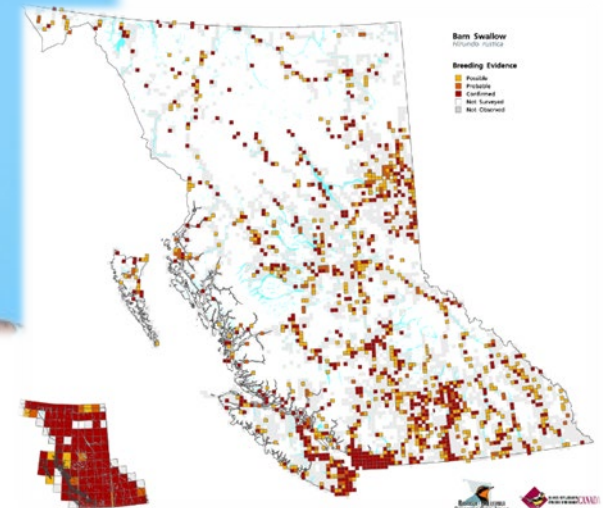
**BCTS**  
BC Timber Sales

## Habitat:

- Open **grasslands, fields, over water, and open forest cutblocks** where nesting habitat exists.
- Often found **near water**, can be small ponds.
- During breeding season these birds can be found at mud puddles sourcing mud for nest building.
- Long-distance migrating bird.

## Range:

- Barn Swallows are **found throughout British Columbia**.
- One of the most common widespread birds in British Columbia and the World, but is threatened by habitat loss, climate change/earlier Springs, and declining insect populations.
- Can be found from **low elevations in open habitat to alpine meadows**.





# Great Blue Heron *Ardea herodias herodias*



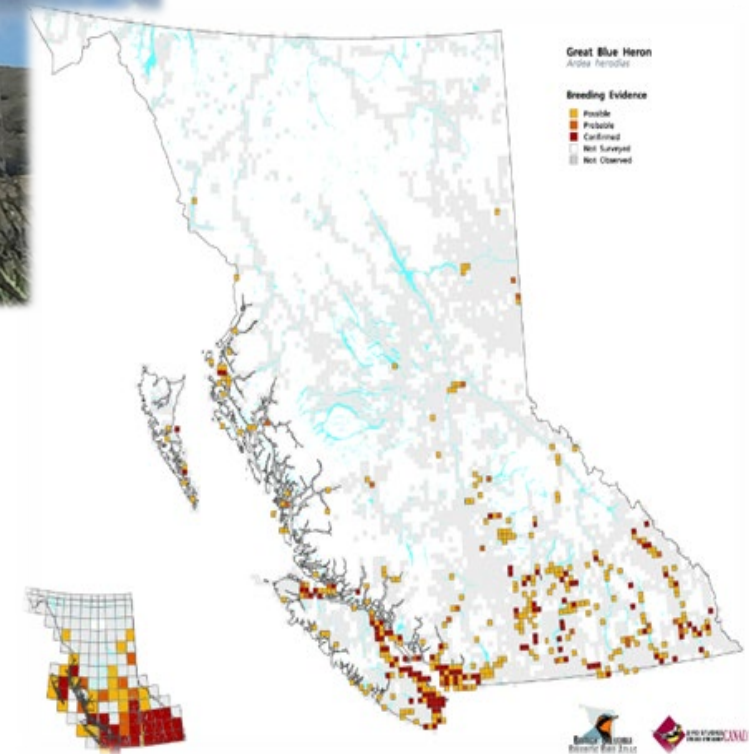
**BCTS**  
BC Timber Sales

## Habitat:

- Forage in fresh and marine waters and riparian and tidal areas, mudflats, grassland and farm field.
- During non-breeding periods birds may roost high up in mature trees in close proximity to foraging sites.
- Canopy closures of >80% is typical for *Heronries*.
- **Most common on the South Coast** in association with low elevation lakes, wetlands, sloughs and estuaries.

## Range:

- In British Columbia the Great Blue Heron *Herodias* subspecies is **primarily migratory**, although some stay in the southern portions of the province where waters don't freeze. **Interior populations may migrate to the west coast for winter.**
- *Herodias* and *Fannini* populations overlap in Coastal British Columbia.



# Northern Goshawk *laingi* (*Accipiter gentilis laingi*)



**BCTS**  
BC Timber Sales

## Description:

- **Two subspecies** of Northern Goshawk in British Columbia; ***Laingi* breeds in coastal rainforests ;*Atricapillus* breeds in the interior.**
- A raven sized (50cm long) sturdy hawk.
- Adults are **brown-gray to slate-gray** on the back.
- **Underparts are pale-gray with fine horizontal grey bars** and darker vertical streaking.
- There is a **distinctive whitish line above the eye and a dark-gray to black cap.**
- **Long tail rounded at the tip with a thin white band.**
- Broad round tipped wings.

## Biology:

- **Diet of birds, small mammals, amphibians and reptiles and insects.**
- They hunt **below the canopy** in open forests.
- **Stick nests** are built under the canopy in **large trees.**
- **The same nest may be used more than once.** Can have alternate nests.
- **Clutch size of 2-4,** one brood annually.
- **Eggs are bluish white.**

## Phenology:

		Breeding			Nestling/Fledging						
Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec





# Northern Goshawk *laingi* (*Accipiter gentilis laingi*)



**BCTS**  
BC Timber Sales

## Habitat:

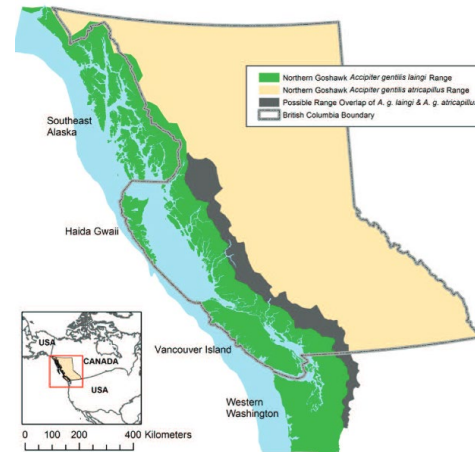
- Second growth stands > 60 years and old growth forests for nesting.
- Open and dense forests of all types for foraging.
- Tree snags, coarse woody debris and open forests are all important habitat attributes.

## BEC Zones:

- CWH, CDF.

## Range:

- The coastal subspecies (*Accipiter gentilis laingi*) occurs along the northwest coast of North America from Washington to Alaska.
- Resident year round on British Columbia coast.



# Osprey (*Pandion haliaetus*)



**BCTS**  
BC Timber Sales

## Description:

- Ospreys have **long narrow wings**, dark brown upperparts, and white underparts
- **Head is white with a prominent dark eye streak**, and dark **wrist patches (visible in flight) on the underside of the wings.**
- Immatures have pale buff edging on the dark feathers of the upper surface.
- Females are more likely than males to have a necklace of dark streaking.
- Average length 56-64 cm, **wingspan 147-183 cm.**

## Biology:

- The Osprey **diet consists almost entirely of fish.**
- **Small mammals**, birds, reptiles, amphibians or crustaceans may be taken.
- **Capture prey with a feet first plunge**, usually into water.
- **Large stick nest** on natural nest sites, usually in **treetops of large trees, cliffs and on rocky ledges.**
- The same nest is used year after year, but can have alternate nests.
- **Nests usually close to open**, shallow water, within 4km, can be 20km.
- **Clutch size of 1-4**, one brood annually.
- **Eggs are white pinkish**, marked with brown olive spots.

## Phenology:

				Breeding	Fledging						
Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec



# Osprey (*Pandion haliaetus*)



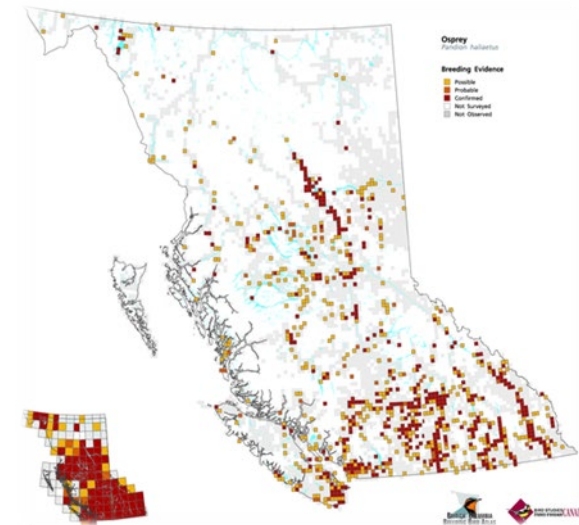
**BCTS**  
BC Timber Sales

## Habitat:

- Primarily along rivers, lakes, streams and marine environments.
- Open sites with suitable nesting sites close to water.

## Range:

- Throughout British Columbia during the breeding season **except** Haida Gwaii.



## Sandhill Crane (*Ardea herodias fannini*)



**BCTS**  
BC Timber Sales

### Description:

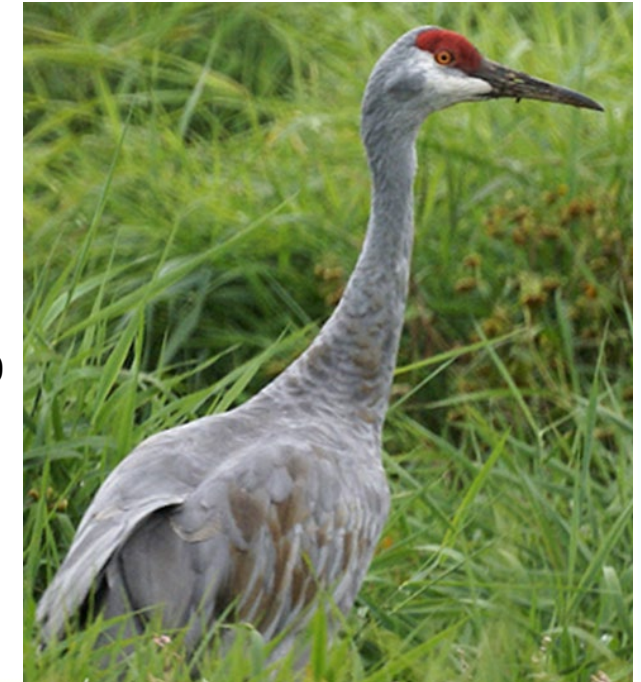
- Height: 1-1.2 m (4') and a Wingspan about 1.6 m (5').
- Featherless red skin covers the forehead and crown. Feathers on the face, throat and nape are white to pale grey. Adults have a white cheek patch.
- Legs and toes are dark grey to black.
- Have a "bustle" covering the lower back and tail feathers.

### Biology:

- They are ground nesters.
- Breeding period is most sensitive to disturbance; noise up to 1000m (April 1-September 21).

### Habitat:

- Isolated and undisturbed wetland (>1 ha) or complexes surrounded by forest are most often utilized.
- Nest mounds are made of sticks, emergent sedges, reeds, grasses, and mosses and raised 15-20 cm above the water.
- They will frequently use coniferous forests adjacent to nesting areas for escape cover. These features are especially critical for birds nesting in small wetlands.



# Western Screech-Owl, *kennicottii* (*Megascops kennicottii kennicottii*)



**BCTS**  
BC Timber Sales

## Description:

- **Two distinct subspecies** in British Columbia, the *kennicottii* along the **Pacific coast** and the *macfarlanei* in the valleys of the southern interior.
- **A small sized owl**, 19-25 cm long.
- **Grey-brown owl with feather “ear” tufts and yellow eyes.**
- **The head is crowned with a triangular russet and black cap** that follows the eyebrow ridge to the ear tufts.
- **Breast and belly are pale with dark vertical streaking.**
- **The coastal subspecies tends to have greater brown colouration while the interior subspecies is greyer.**

## Biology:

- **Diet consists of small mammals**, including mice, voles, insects, amphibians, and small fish.
- **A nocturnal predator.**
- **A cavity nester that often nests in abandoned cavities of the Northern Flicker or Pileated Woodpecker.**
- **Nest in large diameter deciduous trees, Alder, Black Cottonwood, Aspen, Bigleaf Maple and Birch.**
- **Two to seven white eggs**, usually one brood.

## Phenology:

		Nesting			Fledging						
Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec



# Western Screech-Owl, *kennicottii* (*Megascops kennicottii kennicottii*)



**BCTS**  
BC Timber Sales

## Habitat:

- The Western Screech-Owl is found in almost every type of **low elevation woodland habitat, including coniferous and deciduous forests and suburban gardens, most often near streams or in riparian habitats.**
- The key is availability of **suitable roosting cover and nest sites.**
- They **will use nest boxes** if no suitable tree cavities exist.

## BEC Zones:

- CWH, CDF, MH.

## Range:

- Western Screech-Owl *kennicottii* **subspecies occur in low elevations and valley bottoms in coastal British Columbia.** Have been found from sea level to 600 meters in the coastal regions of British Columbia.
- Range consists of coastal areas,** except Haida Gwaii, east to the crest of the Cascade and Coast Mountain Ranges.





## Cryptic Paw (*Nephroma occultum*)

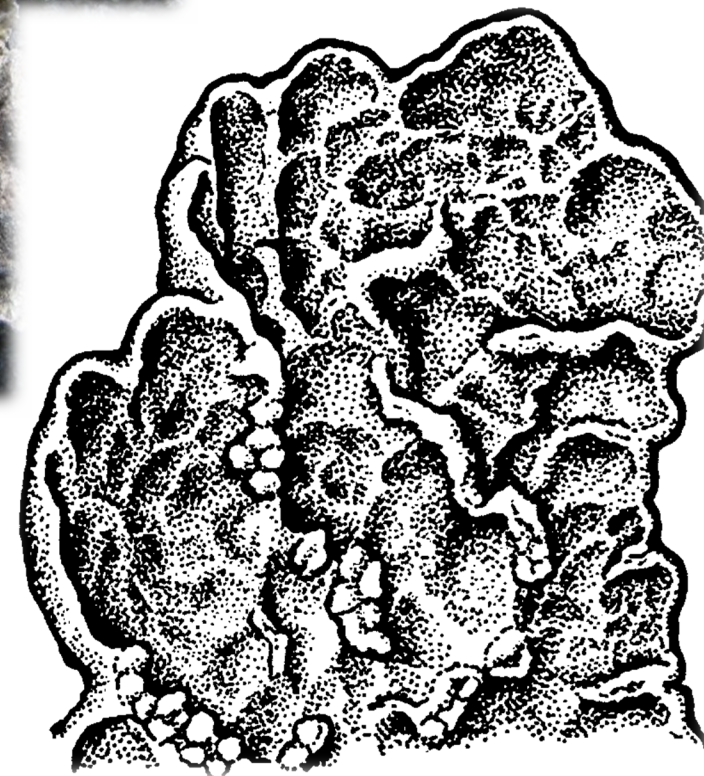
### Cryptic Paw:

#### Description:

- Cryptic Paw is part of the group called **Paw Lichens**, so named because of the brown, paw-like apothecia (the spore-producing sexual stage of reproduction) on the lower surface; in all other genera the apothecia are located over the upper surface or along the lobe margins.
- It has a **yellowish, greenish, or bluish-grey upper surface with net-shaped ridges**, and a **hairless tan to sometimes blackish lower surface**.
- It is commonly **2-7 cm broad** 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**.
- Generally, **apothecia are absent**.

#### Biology:

- Cryptic paw produces **large numbers of asexual soredia** which are thought to be dispersed by wind, rain, and animals.
- The **soredia of *N. occultum* are larger than those of most lichens**, and poor propagule dispersal is a factor which limits distribution.
- Cryptic Paw generally does not have sexual structures (apothecia) and may have low genetic variation.
- This species is a **poor competitor** and is **displaced by mosses or liverworts** where these are the dominant epiphytes.
- Intolerant of **summer drought**.





## Cryptic Paw (*Nephroma occultum*)

### Cryptic Paw:

#### Habitat:

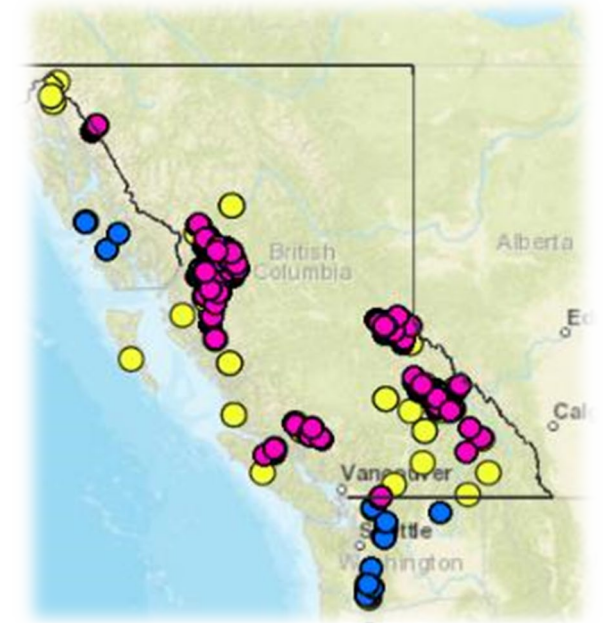
- Infrequent **over conifers in open old-growth maritime and intermontane forests at lower elevations.**
- Moist forested regions at elevations below 1200 m, and **most populations occur between 400 m and 800 m.**
- Inhabits the **upper forest canopy of coastal ecosystems but is restricted to the lower forest canopy in inland localities** where humidity is maintained throughout the **summer by shading** and by **moisture retention** from older trees and associated vegetation.
- Grows in forests which receive **at least 75 mm** of precipitation during the summer months, and which have nutrient-rich soils, typically with toe-slope topography where soils are enhanced by moisture and nutrient addition.

#### Range:

- **Coastal and inland rainforests in BC.** South to Oregon.

#### Field Guidance:

- Do not disturb the plant.
- Confirm species identification through photos and specialist if necessary.
- Document and GPS the location.
- Report to BCTS.





# Ecosystems of Management Concern Awareness Training



**BCTS**  
BC Timber Sales

# 12 Ecosystems of Management Concern Awareness Training

BCTS Seaward (tlasta) Species of Management Concern (SoMC) SOP - Appendix 2B Plant Communities List- 2021

Scientific Name	English Name	Global Status	Prov Status	BC List	Land Use Objectives*	BGC	Ecosystem Group	CDC Maps
<b>RED-LISTED*</b>								
<i>Picea sitchensis</i> / <i>Maianthemum dilatatum</i> Very Wet Hypermaritime 1	Sitka spruce / false lily-of-the-valley Very Wet Hypermaritime 1	G1G2	S1S2 (2014)	Red	Central and North Coast LUO; South Central Coast LUO	CWHvh1/08	Terrestrial Realm - Flood Group (F): Highbench Flood	Y
<i>Picea sitchensis</i> / <i>Maianthemum dilatatum</i> Wet Hypermaritime 1	Sitka spruce / false lily-of-the-valley Wet Hypermaritime 1	G2G3	S2	Red	Central and North Coast LUO; South Central Coast LUO	CWHvh2/08;CWHwh1/07	Terrestrial Realm - Flood Group (F): Highbench Flood	Y
<i>Picea sitchensis</i> / <i>Rubus spectabilis</i> Dry	Sitka spruce / salmonberry Dry	G1G2	S1S2	Red	Central and North Coast LUO; South Central Coast LUO	CWHdm/08;CWHds1/08	Terrestrial Realm - Flood Group (F): Highbench Flood; Terrestrial Realm - Forest: Mixed - moist/wet	Y
<i>Picea sitchensis</i> / <i>Trisetum canescens</i>	Sitka spruce / tall trisetum	G1G2	S1S2	Red	Central and North Coast LUO; South Central Coast LUO	CWHvh1/09;CWHvh2/09;CWHwh1/08	Terrestrial Realm - Flood Group (F): Middle Bench Flood Class (Fm);Terrestrial Realm - Forest: Coniferous - moist/wet	Y
<i>Thuja plicata</i> / <i>Polystichum munitum</i> Dry Maritime	western redcedar / sword fern Dry Maritime	G2G3	S2?	Red	South Central Coast LUO	CWHdm/05	Terrestrial Realm - Forest: Coniferous - mesic	N
<i>Pseudotsuga menziesii</i> / <i>Polystichum munitum</i>	Douglas-fir / sword fern	G2G4	S2S3	Red	South Central Coast LUO	CWHdm/04;CWHxm1/04;CWHxm2/04	Terrestrial Realm - Forest: Coniferous - dry	Y
<i>Tsuga heterophylla</i> - <i>Thuja plicata</i> / <i>Blechnum spicant</i>	western hemlock - western redcedar / deer fern	G2G3	S2 (2013)	Red	South Central Coast LUO	CWHdm/06;CWHxm1/06;CWHxm2/06	Terrestrial Realm - Forest: Coniferous - moist/wet	Y
<b>BLUE-LISTED*</b>								
<i>Picea sitchensis</i> / <i>Carex obnupta</i>	Sitka spruce / slough sedge	G2G3	S2S3 (2004)	Blue		CWHvh1/18;CWHvh2/18;CWHwh1/17	Terrestrial Realm - Forest: Coniferous - moist/wet	N
<i>Thuja plicata</i> - <i>Picea sitchensis</i> / <i>Oplopanax horridus</i> Very Wet Hypermaritime 1	western redcedar - Sitka spruce / devil's club Very Wet Hypermaritime 1	G1G3 (2005)	S2S3 (2010)	Blue	Central and North Coast LUO; South Central Coast LUO	CWHvh1/07	Terrestrial Realm - Forest: Coniferous - moist/wet	N
<i>Tsuga heterophylla</i> - <i>Abies amabilis</i> / <i>Hylocomium splendens</i>	western hemlock - amabilis fir / step moss	G2G3	S2S3 (2005)	Blue		CWHms1/01;CWHms2/01	Terrestrial Realm - Forest: Coniferous - mesic	N
<i>Tsuga heterophylla</i> - <i>Pinus contorta</i> / <i>Pleurozium schreberi</i>	western hemlock - lodgepole pine / red-stemmed feathermoss	G2G3	S2S3 (2007)	Blue		CWHws1/03;CWHws2/03	Terrestrial Realm - Forest: Coniferous - dry	N
<b>YELLOW-LISTED*</b>								
<i>Pseudotsuga menziesii</i> - <i>Pinus contorta</i> / <i>Holodiscus discolor</i> / <i>Cladina</i> spp.	Douglas-fir - lodgepole pine / oceanspray / reindeer lichens	G2G3	S3S4 (2019)	Yellow	South Central Coast LUO	CWHdm/02	Terrestrial Realm - Forest: Coniferous - dry	Y



# Ecosystems of Management Concern Awareness Training



**BCTS**  
BC Timber Sales

1. CWHvh1/08 Sitka Spruce/false lily-of-the-valley-very-wet
2. CWHvh2/08;CWHwh1/07 Sitka Spruce/false lily-of-the-valley-very-wet hypermaritime 1
3. CWHdm/08; CWHds1/08 Sitka Spruce / salmonberry Dry
4. CWHvh1/09; CWHvh2/09; CWHwh1/08 Sitka Spruce / tall trisetum
5. CWHdm/05 Western redcedar / sword fern Dry
6. CWHdm/04; CWHxm1/04; CWHxm2/04 Douglas-fir / sword fern
7. CWHdm/06; CWHxm1/06; CWHxm2/06 Western hemlock-Western redcedar- / deer fern
8. CWHvh1/18;CWHvh2/18;CWHwh1/17 Sitka spruce / slough sedge
9. CWHvh1/07 Western redcedar-Sitka spruce /evil's club Very Wet Hypermaritime
10. CWHms1/01; CWHms2/01 Western hemlock – amabilis fir / step moss
11. CWHws1/03;CWHws2/03 Western hemlock – lodgepole pine / red-stemmed feathermoss
12. CWHdm/02 Douglas-fir – lodgepole pine / oceanspray / reindeer lichens

# CWHvh1 /08



**BCTS**  
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- **Red Listed Plant Communities**
- **Sitka spruce / false lily-of-the-valley Very Wet Hypermaritime 1**
  - CWHvh1 /08;
  - **High bench floodplain ecology**
  - Tree layer is dominated by **red alder** followed by **Sitka spruce**. **Black cottonwood** may be present;
  - **Very sparse shrub layer dominated by salmonberry** with lesser amounts of stink current, Alaskan blueberry, red elderberry, red-osier dogwood and willow;
  - **Very sparse herb layer dominated by oak fern and pink wintergreen** followed by lady fern and rosy twistedstock; and
  - **Very sparse moss layer.**

# CWHvh2/08;CWHwh1/07



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## Red Listed Plant Communities

- **Sitka spruce / false lily-of-the-valley Wet Hypermaritime**
  - CWHvh2/08;CWHwh1/07
- **High bench floodplain ecology;**
- **Tree layer dominated by Sitka spruce and western hemlock** with lesser amounts of western redcedar, amabilis fir and red alder;
- **Moderate shrub layer dominated by salmonberry and stink current**, with lesser amounts of oval-leaved blueberry, Alaskan blueberry and red elderberry;
- **Very sparse herb layer** dominated by Hookers fairybells and Cooley's hedge-nettle with lesser amounts Alaska oniongrass;
- **Sparse moss layer** with equal amounts of coastal leafy moss, lanky moss, step moss and common feather moss.

# CWHdm/08; CWHds1/09

- **Red Listed Plant Communities**

- **Sitka spruce / salmonberry Dry**

- **CWHdm / 08**; High bench floodplain ecology
- **Tree layer dominated by red alder, black cottonwood, bigleaf maple, Sitka spruce and western redcedar** with lesser amounts of western hemlock;
- **Moderate shrub layer dominated by salmonberry and devil's club** with lesser amounts of red elderberry, stink current, and common snowberry. Utah honeysuckle may be present;
- **Sparse but diverse herb layer** dominated by false lily-of-the-valley, star-flowered false Solomon's seal, sword fern, piggy-back plant, mountain sweet-cicely, three-leaved foam flower, spiny wood fern and Hooker's fairy bells. Vanilla leaf and one-leaved foam flower may be present.
- **Sparse moss layer** mostly of coastal leafy moss and electrified cat's-tail moss.



**BCTS**  
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Mountain Sweet-cicely



Piggyback plant in bloom





- **Red Listed Plant Communities**

- **Sitka spruce / tall trisetum**

- CWHvh1/09; CWHvh2/09; CWHwh1/08

- **Tree layer is dominated by red alder** followed by black cottonwood and then Sitka spruce;

- **Very sparse shrub layer dominated by willow;**

- **Very sparse herb and moss layer.**



- **Red Listed Plant Communities**
  - **Western redcedar / sword fern Dry Maritime**
    - CWHdm / 05
  - **Tree layer is dominated by Douglas-fir, western redcedar and western hemlock.** Red alder may be present;
  - **Shrub layer is very sparse and dominated by vine maple** with lesser amounts of dull Oregon-grape and red huckleberry. Salal may be present;
  - **Herb layer is sparse and dominated by sword fern** and lesser amounts of spiny wood fern. Trace amounts of bracken fern may be present;
  - **Moss layer is sparse and dominated by step moss and Oregon beaked moss** with lesser amounts of flat moss. Lanky moss and coastal leafy moss may be present.



# CWHdm/04; CWHxm1/04; CWHxm2/04



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- **Red Listed Plant Communities**

- **Douglas-fir / sword fern**

- **CWHdm / 04**

- **Tree layer is dominated by Douglas-fir, western redcedar and western hemlock with lesser amounts of bigleaf maple;**

- **Shrub layer is very sparse and dominated by vine maple and salal;**

- **Herb layer is very sparse and dominated by sword fern and lesser amounts of bracken fern;**

- **Moss layer is sparse and dominated by flat moss and step moss with lesser amounts of Oregon beaked moss and electrified cat's tail moss.**

# CWHdm/06; CWHxm1/06; CWHxm2/06



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- **Red Listed Plant Communities**
  - **Western hemlock – western redcedar /deer fern**
    - CWHdm/06; CWHxm1/06; CWHxm2/06
  - **Tree layer dominated by western redcedar and western hemlock** with lesser amounts of Douglas-fir. Red alder may be present;
  - **Moderate shrub layer dominated by salal and Alaska blueberry and red huckleberry** with lesser amounts of salal, and salmonberry;
  - **Moderate to sparse herb layer dominated by sword fern and deer fern** with lesser amounts of spiny wood fern, three-leaved foam flower, and sparse amounts of bracken fern and bunch berry;
  - **Sparse moss layer dominated by flat moss and lanky moss.**

# CWHvh1/18;CWHvh2/18;CWHwh1/17



**BCTS**  
BC Timber Sales

- **Blue Listed Plant Communities** page 1 of 2
- **Western hemlock – Sitka spruce / devil’s club very wet Hypermaritime 1**
  - CWHvh1/18; CWHvh2/18; CWHwh1/17
- **Tidal low bench floodplain:** Occurs in association with tidal floodplains and sloughs along low-gradient river and stream outlets, which are protected from open ocean wave action and is restricted to substrates of fine sandy active fluvial and marine sediments.
- Small inclusions of this community also occur within wet depressions between sandy ridges, not far behind present-day outer coast sand and shingle beaches. The medium-rich to very rich mineral soils are poorly to very poorly drained with a wet soil moisture regime, both due to strongly fluctuating (diurnal) brackish water tables and surface water levels.



- **Blue Listed Plant Communities** page 2 of 2
- **Western hemlock – Sitka spruce / devil’s club very wet Hypermaritime 1**
  - **CWHvh1/18; CWHvh2/18;CWHwh1/17**
- **Tidal low bench floodplain:** Rich site. This community has a variably developed canopy comprised of Sitka spruce, with a minor component of Western redcedar and western hemlock.
- **The well-developed shrub layer consists of species tolerant of brackish waters, and features Pacific crab apple, Salal, salmonberry, Sitka spruce, black twinberry, western hemlock, western redcedar, evergreen huckleberry and Hooker's willow. Herb layer is lush and includes high amounts of slough sedge and lesser amounts of false lily-of-the-valley, deer fern, skunk cabbage, American vetch, lady fern, sword fern, clasping twisted stalk and three-leaved foamflower.**



- **Blue Listed Plant Communities** Western redcedar-Sitka spruce / devil's club Very Wet Hypermaritime
  - CWHvh1 / 07
  - Tree layer consists of Western Hemlock, Sitka Spruce and Amabilis fir.
  - The shrub layer is dominated by salmonberry, red huckleberry and deer fern. Salal may be present in small amounts.
  - The herb layer is dominated by sword fern with lesser amounts of lady fern, oak fern and three-leaved foam flower. The two most common mosses are Lanky moss and Oregon beaked moss.

# CWHms1/01; CWHms2/01



**BCTS**  
BC Timber Sales

## Blue Listed Plant Communities page 1 of 2

Western hemlock – amabilis fir/ step moss

➤ CWHms1/01; CWHms2/01

- **The tree layer consists mainly of western hemlock**, and lesser amounts of yellow cedar and western redcedar and Sitka Spruce. Lodgepole Pine may or may not be present.
- **The shrub layer is relatively sparse, dominated by Alaska blueberry**, and lesser amounts of oval-leaved blueberry and red huckleberry.
- **The herb layer is even more sparse with small amounts of deer fern, fern-leaved goldthread, three leaved foam flower and oak fern.**
- **The most common mosses are step moss, lanky moss and large leafy moss.**

# CWHms1/01; CWHms2/01



**BCTS**  
BC Timber Sales

## Blue Listed Plant Communities page 2 of 2

Western hemlock – amabilis fir/ step moss

➤ CWHms1/01; CWHms2/01



# CWHws1/03;CWHws2/03



**BCTS**  
BC Timber Sales

- **Blue Listed Plant Communities**
- **Western hemlock – lodgepole pine / red-stemmed feathermoss**
  - **CWHws1/03;CWHws2/03**
- **The tree layer consists mainly of western hemlock**, and lesser amounts of yellow cedar and western redcedar and Sitka Spruce. Lodgepole Pine may be present.
- **The shrub layer is relatively sparse, dominated by Alaska blueberry**, and lesser amounts of oval-leaved blueberry and red huckleberry.
- **The herb layer is even more sparse with small amounts of deer fern**, fern-leaved goldthread, three leaved foam flower and oak fern. The most common mosses are step moss, lanky moss and large leafy moss.





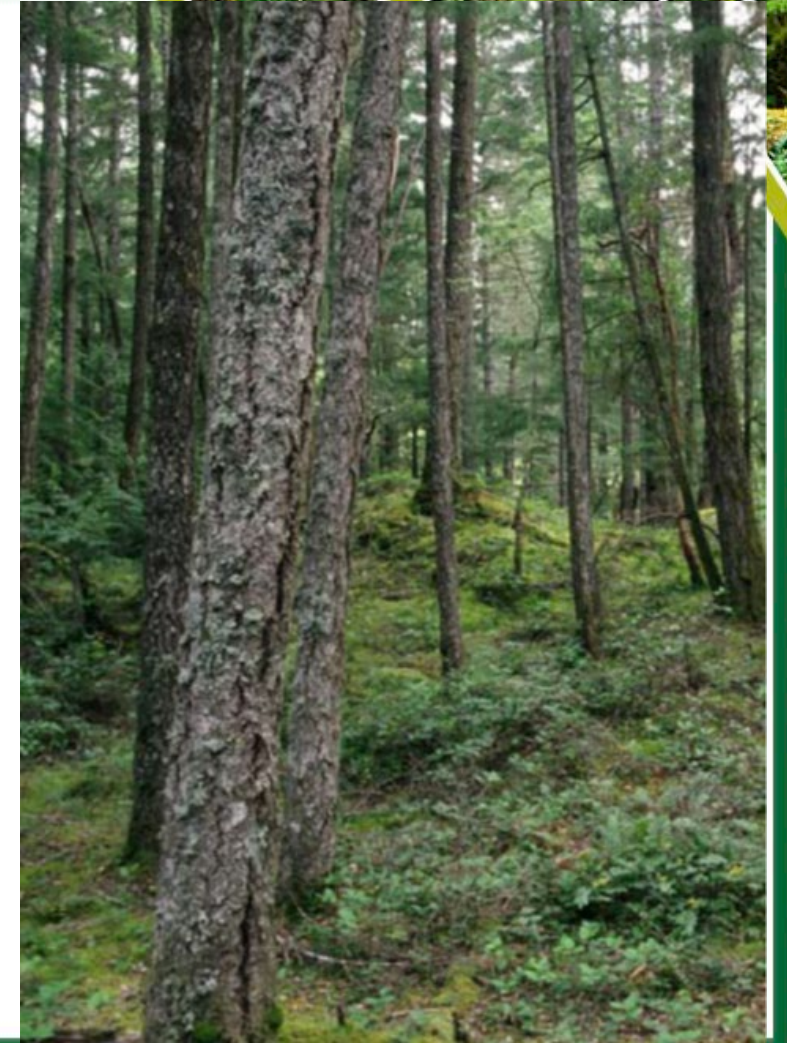
- Yellow Listed Plant Communities Page 1 of 2
- Douglas-fir – Lodgepole pine / oceanspray/ reindeer lichens
  - CWHdm/02
- This ecological community **occurs on ridge crests, hilltops and south-facing upper slopes**, often on areas **with shallow soils and exposed bedrock**. Sites are rapidly to **well drained, very dry** and often nutrient poor.
- **Tree layer, the common species are Douglas fir** followed by followed by shore/lodgepole pine. Some western redcedar may be present.
- **The shrub layer is relatively sparse, ocean spray, salal and red huckleberry** being the most dominant. Hairy manzanita may be found in diminished amounts
- **The herb layer is almost non-existent** with western fescue and possibly bracken fern. The **most common mosses are Roadside rock moss and red-stemmed feather moss**. Lichens are present in small amounts.

# CWHdm/02



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- Douglas-fir – Lodgepole pine / oceanspray/
- reindeer lichens
- CWHdm/02 Page 2 Of 2



# Forested Swamps



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# Forested Swamps



- Supplement to Terry Lewis description.
- Forested swamps are a unique rich to very rich ecosystem.

Forested Swamp Type	Associated BEC Site Series
Ws08	ESSFmw/08
Ws53	CWHxm/12
Ws54	CWHds2/12, CWHmm1/12, CWHms2/11 <sup>1</sup> , CWHvh1/13, CWHvh2/13, CWHwh1/12, CWHvm1/14, CWHws2/11
Ws55	MHmm2/09, MHwh1/09

FIGURE 5.0-3 Environmental characteristics useful for determining nutrient status in wetlands.

SNR	Forested Swamp					
	A Very Poor	B Poor	C Medium	D Rich	E Very Rich	F Hyper
Available nutrients	very low	low	average	plentiful	abundant	excess alkali or salt accumulation
Water pH	<5.0	4.5-6.0	5.0-6.5	6.0-7.4	6.5-8.0	8.0+
vonPost of surface tier	1-3	3-6	4-7	7-10	8-10	
Ground - water flow through site	stagnant		seasonal seepage		continuous seepage	
C:N ratio	High		Medium	Low		
Surface tier material	Fibrimor		Mesimor	Saprimoder		Marl
Water colour	tea colored; yellowish-deep brown and turbid			green-brown and turbid		blue-green and very clear (alkaline)
Colour of surface peat	pale			dark		
Surface tier saturation	always saturated		seasonal exposure of substrate		diurnal exposure of substrate	

# Forested Swamps



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## Minerotrophic Indicator Species

Scientific Names	Common Names
<i>Athyrium Felix-femina</i>	Lady fern
<i>Carex aquatilis</i>	Water sedge
<i>Comarum palustre</i>	Marsh cinquefoil
<i>Equisetum sp.</i>	Horsetail
<i>Gymnocarpium dryopteris</i>	Oak Fern
<i>Lysichiton americanus</i>	Skunk cabbage
<i>Streptopus amplexifolius</i>	Clasping twistedstalk
<i>Tiarella trifoliata</i>	Foamflower
<i>Viola palustris</i>	Marsh violet
<i>Vaccinium sp.</i>	Blueberry
<i>Vaccinium alaskaense/ovalifolium</i>	Alaska/oval-leaved blueberry
<i>Pellia neesiana</i>	Ring pellia (Liverwort)

- A swamp is a nutrient-rich wetland ecosystem where significant ground-water inflow, periodic surface aeration and/or elevated micro-sites allows growth of large trees and tall shrubs under subhydric conditions
- **Forested swamps have abundant minerotrophic (mineral rich) indicators.**
- pH 6-8 (neutral)
- **>50% of the area is raised microsites (the only areas that will sustain tree growth)**

# Forested Swamps



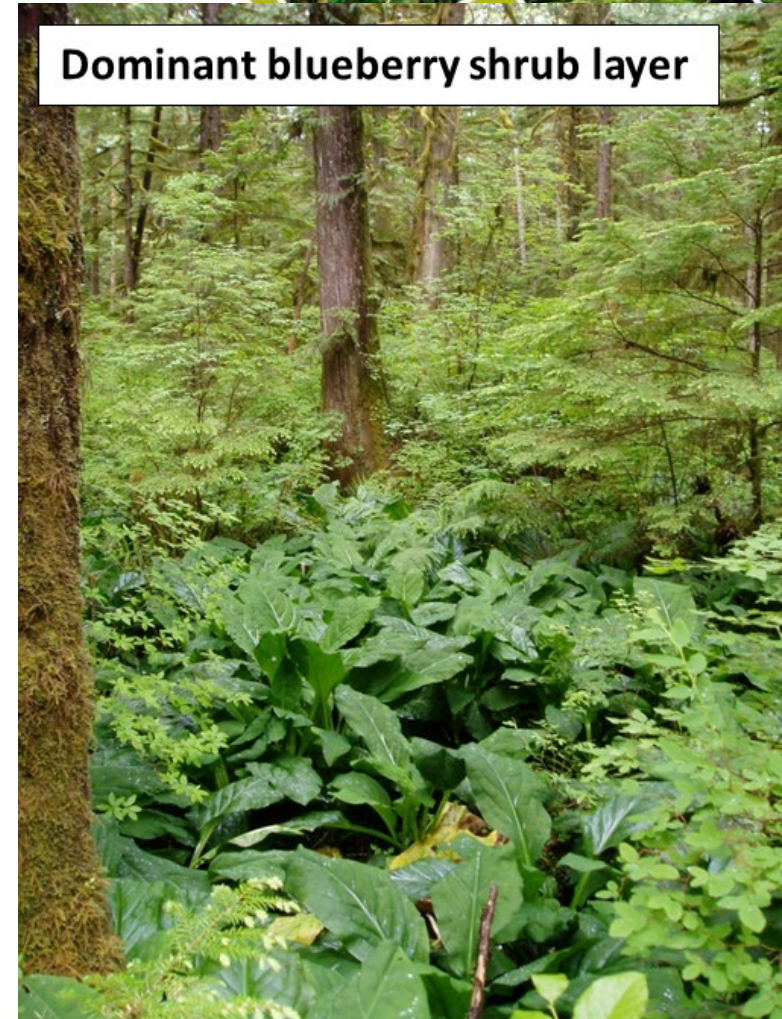
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**Large Ring Pellia**



**Raised microsities and large and thick skunk cabbage**



**Dominant blueberry shrub layer**



# Forested Swamps



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Dominant blueberry shrub layer  
Often large trees

Five-leaved bramble



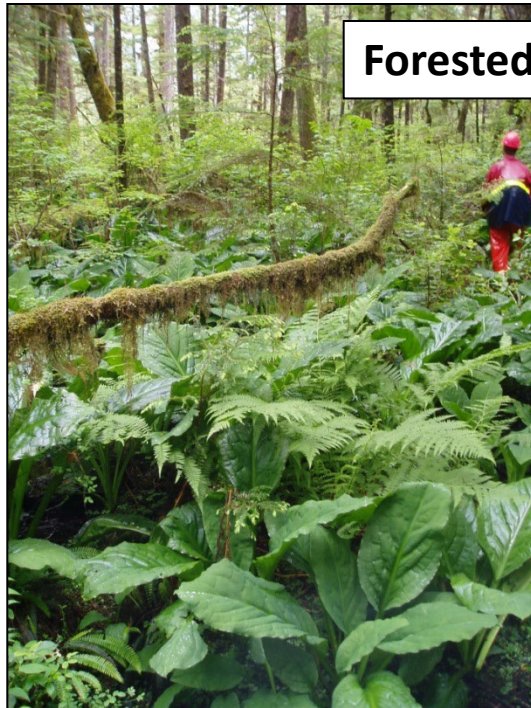
Marsh Violet



# Forested Swamps

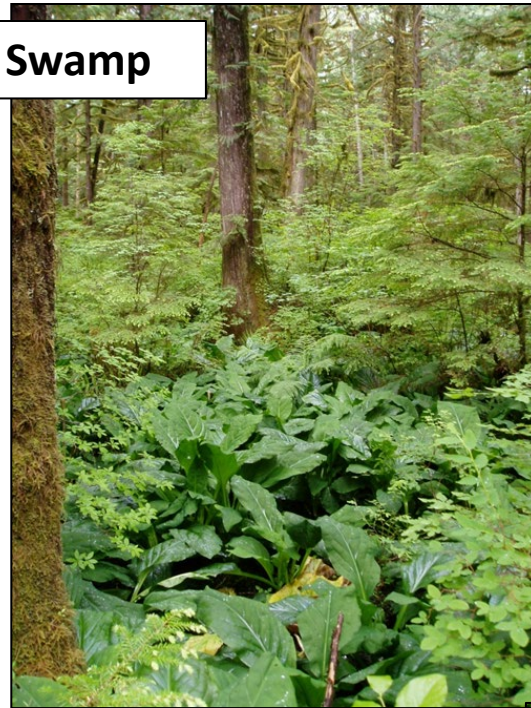


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**Forested Swamp**

Dense vaccinium, large ring pelliia. Minerotrophic indicator's abundant and thriving, skunk cabbage, raised microsities and black rich soil, no moss layer



**Upland wooded swamp**

Scant Vaccinium, ring pelliia & other minerotrophic indicator's subdued, salmonberry absent. Moss layer raised microsities subdued, 80% raised microsities.



# FENS



**Fen:** A groundwater fed wetland with organic soils & water table at or above the surface (permanently saturated). Soils are primarily moderate to well decomposed sedge & non-sphagnum moss peat. Wf50 montane to Sub-alpine.

Waters are mainly nutrient rich with a near neutral to slight acidic pH (pH >5.0). The vegetation consists primarily of sedges, grasses, reeds, brown mosses, & some shrubs; minerotrophic plant species are common.

Scattered trees may be present, but unlikely. Occurs in wet drainage channels or hollows in sloping peatlands & gradual seepage slopes, & protected lake or pond margins where there is little wave action or drawdown.

Minerotrophic Indicator Species

Scientific Names	Common Names
<i>Athyrium Felix-femina</i>	Lady fern
<i>Carex aquatilis</i>	Water sedge
<i>Comarum palustre</i>	Marsh cinquefoil
<i>Equisetum sp.</i>	Horsetail
<i>Gymnocarpium dryopteris</i>	Oak Fern
<i>Lysichiton americanus</i>	Skunk cabbage
<i>Streptopus amplexifolius</i>	Clasping twistedstalk
<i>Tiarella trifoliata</i>	Foamflower
<i>Viola palustris</i>	Marsh violet
<i>Vaccinium sp.</i>	Blueberry
<i>Vaccinium alaskaense/ovalifolium</i>	Alaska/oval-leaved blueberry
<i>Pellia neesiana</i>	Ring Pellia



# FENS

**Buck Bean**



**Marsh  
Cinquefoil**



# FENS Wf51



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**Marsh Violet**



**Narrow leaf cotton**



**Sitka burnet**



**Sitka sedge**



**Sweet gale**





# Marsh Wetlands

**Marsh wetland:** A non-tidal swamp wetland that **has mineral & sometimes well-decomposed peat soils** that are often enriched with mineral materials.

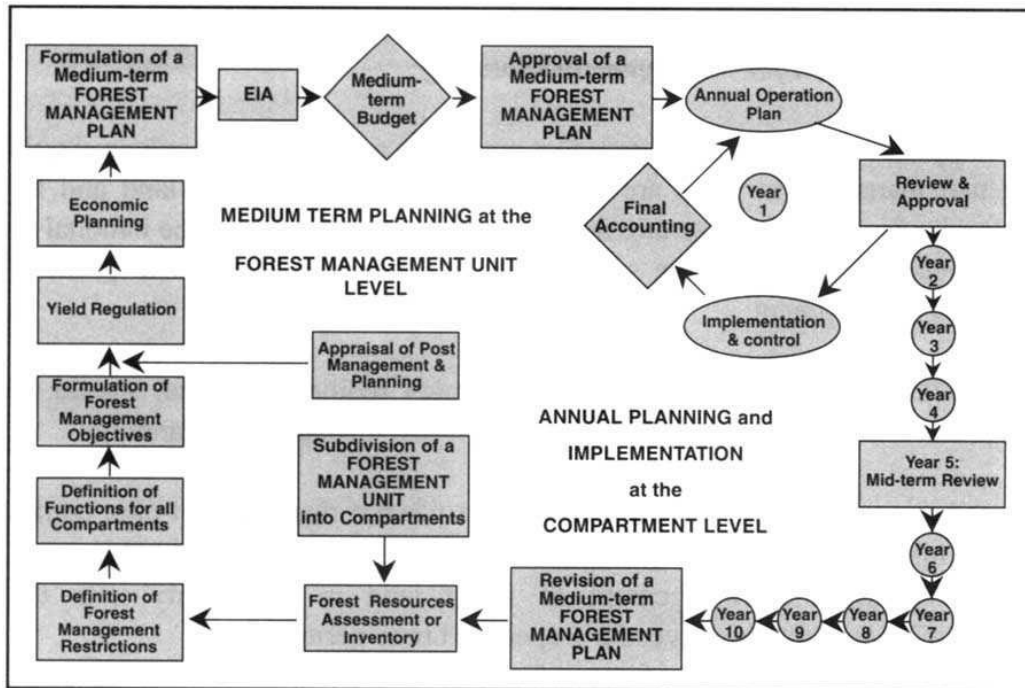
The waters are **nutrient rich with near neutral to basic pH**. Surface water levels typically fluctuate seasonally (permanently to seasonally flooded) with low levels exposing matted vegetation or mudflats.

Most are **dominated by grass like vegetation (Sitka sedge, Pacific water parsley) & bedstraw; Sitka sedge monocultures can occur on many sites**. Emergent vegetation can include grasses along with **cattails, sedges, rushes, & reeds**.

**At minimum, vegetation will cover >25% of the wetland surface**. Found in low elevation areas (<300m asl) in basins & along slow-moving streams, & along pond edges & lakeshores.



## ➤ Decision Making, Management per SOP





## ➤ **Decision Making, Management per SOP**

- Timing of surveys – Intensity of surveys
- Observations (features, species) - incidental = reactive/passive
- Observations (features, species) –QRP surveys = proactive
- Long term planning
  - Maintenance of structure → At least 25 (35%) of the 72 MBCA birds found in the Seaward operating are dependent on large trees and complex forest structure:
    - Hem/bal → Even Age
    - CWH → Uneven age management
    - (criteria for when and where)



➤ **Species of Management Concern**

- **Habitat features** – Safe management of special features
  - E.g., bear dens, bird nests, wildlife trees, Wildlife tree patches
  - Surveys, no work zones, documentation, buffers etc.
  
- **SOP:** *“Address the SOMC assessment findings and associated management strategies and requirements in both the Road and Block Site Plans, and their associated support documents.”*
  
- *Identify the location of known occurrences of SOMC habitat features on the Site Plan, Road Construction and Harvest Plan maps. Identify any areas of concern or timing restrictions relating to the management of the identified features, including any species- or site-specific management requirements, if applicable.”*





# SOP

## ➤ Decision Making, Management per SOP



Mr. Warttig, may I be excused? My brain is full



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➤ **Contacts:**

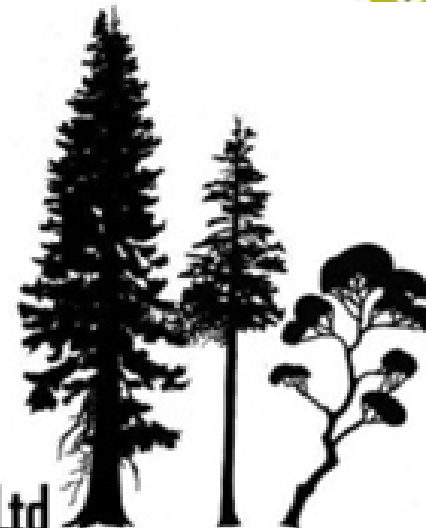
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**MARS**  
WILDLIFE RESCUE CENTRE

**(250)337-2021 Emergency for Injured wildlife**