2.3 Species at Risk

Introduction

The diversity of ecosystems that occur in the CVRD, ranging from some of the wettest to some of the driest in British Columbia (BC), provide habitat for a diversity of species. Many of these species are largely unknown, and new species are still being discovered. The number of known arthropods[58] found in the canopy of ancient trees on the West coast increases each time a new study is carried out (Humble et al. 2000). Some species are naturally rare – found only in certain habitat types or at low levels across the landscape – and these species may or may not be at risk. Other species; however, are known to be "at risk" due to small population sizes or the specific impacts of human activities on their habitat (BC CDC 2015). The CVRD supports a host of species-at-risk including species that are found nowhere else on earth.

Identifying Species at Risk

Species-at risk in BC are primarily identified through the BC Conservation Data Centre (BC CDC), the Committee on the Status of Wildlife in Canada (COSEWIC) and through the *Species at Risk Act* (SARA). The BC CDC systematically collects and disseminates information on plants, animals and ecological communities at risk in British Columbia (BC CDC 2015). Through the BC CDC at-risk plants, animals and ecological communities are assigned rankings of blue or red. Red-listed includes any ecological community, and indigenous species and subspecies that is identified as extirpated, endangered, or threatened in BC. Blue-listed includes any ecological community, and indigenous species and subspecies considered to be of special concern (formerly vulnerable) in BC (BC CDC 2015).

SARA came into effect in June 2003 to protect wildlife species at risk in Canada. SARA is a federal commitment to prevent wildlife species in Canada from disappearing, to provide for the recovery of wildlife species that are extirpated, endangered, or threatened, and to manage species of special concern to prevent them from becoming endangered or threatened. SARA provides a legal framework for the protection of wildlife and conservation of biological diversity in Canada (Environment Canada 2015).

COSEWIC is a committee of experts that assesses and designates the national status of species, subspecies, varieties or other units. COSEWIC ranks each candidate species as extinct, extirpated, endangered, threatened or of special concern (COSEWIC 2015).

Many different species have very specific life history requirements and can be affected by subtle changes; however, loss of habitat is often cited as the primary cause of species decline (Venier et al. 2004, Pogson 2015). Habitats in the CVRD that have been particularly impacted include old forests, wetlands, Garry oak ecosystems and associated meadows and grasslands, marsh and estuarine habitat, rocky bluffs, and shorelines. Many of the species at risk in the CVRD are known to inhabit these ecosystems.

58 Arthropod are invertebrates of the phylum Arthropoda (the largest phylum in the animal kingdom). Arthropods have jointed limbs, a segmented body, and an exoskeleton made of chitin. The group includes the crustaceans, insects, arachnids, and centipedes.

Indicators

Conservation planning is often conducted in the absence of even the most basic information about species distributions and the rate of species or habitat loss (Lawler et al. 2003). In order to measure the loss of habitat or species it is often required that indicators be used. Potential indicator groups that have received attention include well-known taxa, species of conservation concern, and landscape features or vegetation types (Lawler et al. 2003). The number of species-at-risk has been proposed as a good indicator of the overall health of an ecosystem (Lawler et al. 2003). Ideally, trends through time for populations and habitat availability for individual species-at-risk should be tracked, in order to understand whether populations are improving or worsening and to measure available habitat. However, in the absence of good population trend data and measures of habitat availability for most species, this section's indicators focus on:

- Number of animals at risk, with a focus on trends or habitat available for Vancouver Island marmot (*Marmota vancouverensis*), Roosevelt elk (*Cervus elaphus roosevelti*) marbled murrelet (*Brachyramphus marmoratus*) and northern goshawk (*Accipiter gentilis laingi*)
- Number of plants at risk
- Number of ecological communities at risk

Animals at Risk

The BC CDC identifies a total of 67 animal species that are red or blue-listed and are known to occur within the CVRD (Table 2.7; BC CDC 2015). Thirty-five of these species are identified as endangered, special concern, or threatened by COSEWIC and 31 species are identified as at risk through Schedule 1 of SARA. A full list of all species at risk and their conservation status is provided in Appendix A.

TABLE 2.7: Number of red- and blue-listed animal species within the CVRD

Group	Red	Blue	Total
Amphibians	2	3	5
Birds	4	16	20
Fish	2	1	3
Invertebrates	15	16	31
Mammals	3	5	8

Many of the individual species at risk are associated with estuarine or riverine habitats, and many are associated with the ecosystems of concern highlighted in Section 2.2 Sensitive Ecosystems. Of these, some are also of global concern – including the Cowichan Lake lamprey (*Entosphenus macrostomus*) and the Vancouver Island marmot with G1 global rankings as imperiled[59].

59 Conservation status ranks are based on a one to five scale, ranging from critically imperiled (G1) to demonstrably secure (G5). Status is assessed and documented at three distinct geographic scales: global (G), national (N), and state/province (S) (BC CDC 2015).

Of these species at risk, eight subspecies are endemic[60] to Vancouver Island – northern pygmy owl (*Glaucidium gnoma swarthi*), white-tailed ptarmigan (*Lagopus leucura saxatilis*), ermine (*Mustela erminea anguinae*), Cowichan lake lamprey, Vancouver Island marmot, American water shrew (*Sorex palustris brooksi*), the "greenish blue" butterfly (*Plebejus saepiolus insulanus*) and the (now-thought-to-be-extinct) Vancouver Island wolverine (*Gulo gulo vancouverensis*). Some are well-known species, such as Stellar sealion (*Eumetopias jubatus*) and the marbled murrelet. Others are lesser known or understood, such as the broadwhorl tightcoil (*Pristiloma johnsoni*), the western thorn snail (*Carychium occidentale*) and the warty jumping slug (*Hemphillia glandulosa*).

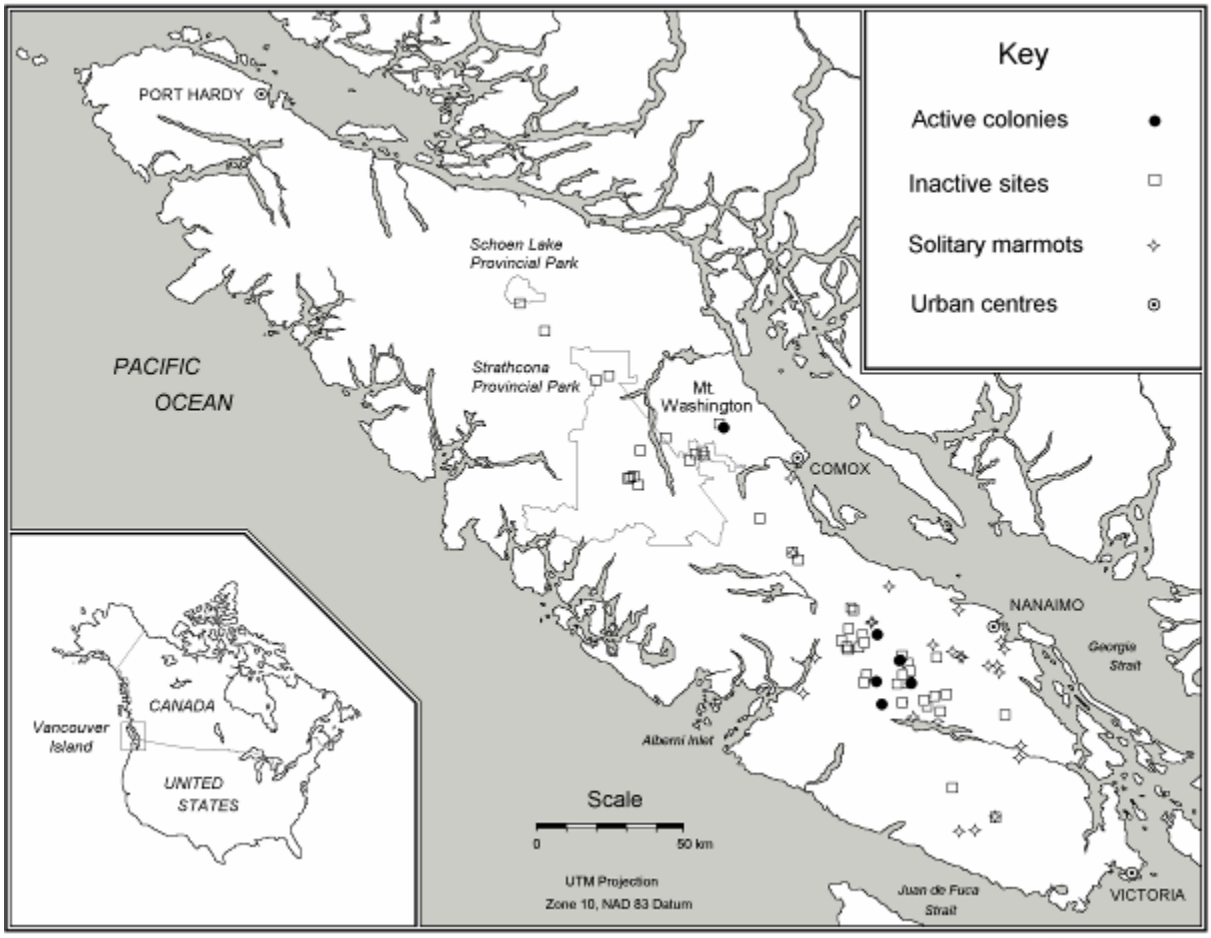
Vancouver Island Marmot

The CVRD supports a significant proportion of the remaining wild population of Vancouver Island marmot (Figure 2.16). The Vancouver Island marmot is a red-listed species that is endemic[60] to Vancouver Island. The Vancouver Island marmot is a high-elevation species, historically occurring in alpine and treeline areas, and – more recently – primarily inhabiting recently logged habitats where they are thought to be more vulnerable to predation (Vancouver Marmot Recovery Team 2008). With the exception of Mount Washington, all known active Vancouver Island marmot colonies are located within five adjacent watersheds – the Nanaimo, Cowichan, Chemainus, Nitinat and Cameron River drainages – with 90% of the estimated population in the year 2000 found within this 150 km^2. These five watersheds occur within the CVRD and are key to the recovery of this species.

Jumping Slugs. Five different species of jumping slugs exist and are endemic to western North America. The warty jumping slug is known to exist in Canada only on 14 different sites on Vancouver Island, south of Nanaimo. It lives in moist riparian low-lying areas and requires decaying logs and litter as shelter. All five species display a "jumping" or twisting behaviour that is thought to be a defence against predators. Habitat loss and fragmentation are thought to be the greatest threats to the population. Only three or four of the known locations are within protected areas – the others are subject to development or private forest land management.[61]

60 Endemic is the ecological state of a species being unique to a defined geographic location.
61 COSEWIC (2003)

Figure 2.16: Vancouver Island marmot colony locations.



Source: Vancouver Island Marmot Recovery Team (2008).

Roosevelt Elk

Roosevelt elk (*Cervus elaphus roosevelti*) are a blue-listed species which have high cultural and social value (Quayle and Brunt 2003). There are approximately 5,400 Roosevelt elk in BC, of which about 4,200 occur on Vancouver Island (BC CDC 2015). There are two metapopulations[62] of Roosevelt elk occurring on Vancouver Island including the larger north Island metapopulation and the smaller south Island metapopulation (Quayle and Brunt 2003). The majority of animals within the south Island metapopulation occur within or near the CVRD (Henigman et al. 2003, Quayle and Brunt 2003; Figure 2.18).

62 A metapopulation consists of a group of spatially separated populations of the same species which interact at some level.

The south Island metapopulation is delineated into 26 population subunits primarily based on the occurrence of watershed boundaries (Quayle and Brunt 2003). The 26 sub-populations of Roosevelt elk within the south Island metapopulation have been categorized as increasing, stable, or declining (Quayle and Brunt 2003). Two of these sub-populations are thought to be in stable-to-declining sub-populations, 13 are stable, 4 are increasing and 7 have unknown population trends. For the CVRD, recent population estimates from 2009 for the sub-units identified in Figure 2.19 are shown in Table 2.8. The largest population subunit within the CVRD is the Shaw sub-unit) which contains an estimated population of 175 animals (Table 2.8). Many of the other sub-units have small estimated numbers of elk. Within the south Island metapopulation there is a tendency for population subunits to be small (50% of the population subunits have less than 25 animals); as such, these sub-populations may be sensitive to hunting pressure and stochastic events (Quayle and Brunt 2003).

Roosevelt elk are ecotonal, occurring at the transition between two biomes, balancing the need for areas that provide for forage which are in close proximity to habitats that provide for thermal and security cover (Blood 2000; Quayle and Brunt 2003; BC CDC 2015). Preferred forage habitats include open coniferous stands, deciduous dominate stands, wetlands, riparian areas, vegetated slides, and the edges of south-facing rock outcrops (Blood 2000; Quayle and Brunt 2003; BC CDC 2015). Security and thermal cover is primarily provided by closed canopy coniferous forests (Quayle and Brunt 2003). Fragmentation of preferred habitats by forestry and urban expansion, combined with predation pressures, mortality on highways, and regulated and unregulated hunting has resulted in declines in populations from historic levels (BC CDC 2015).

FIGURE 2.18: Roosevelt elk distribution within the Coast Forest District

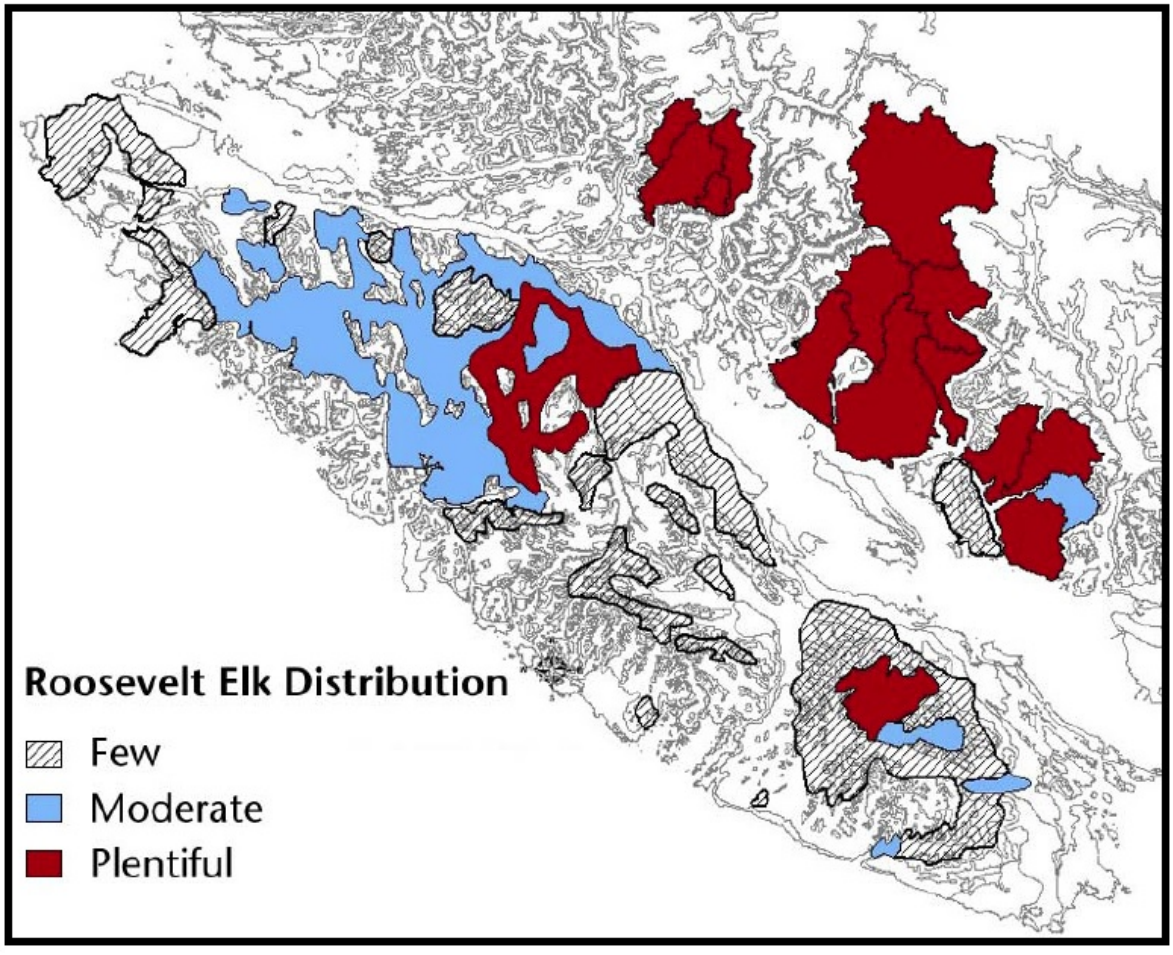
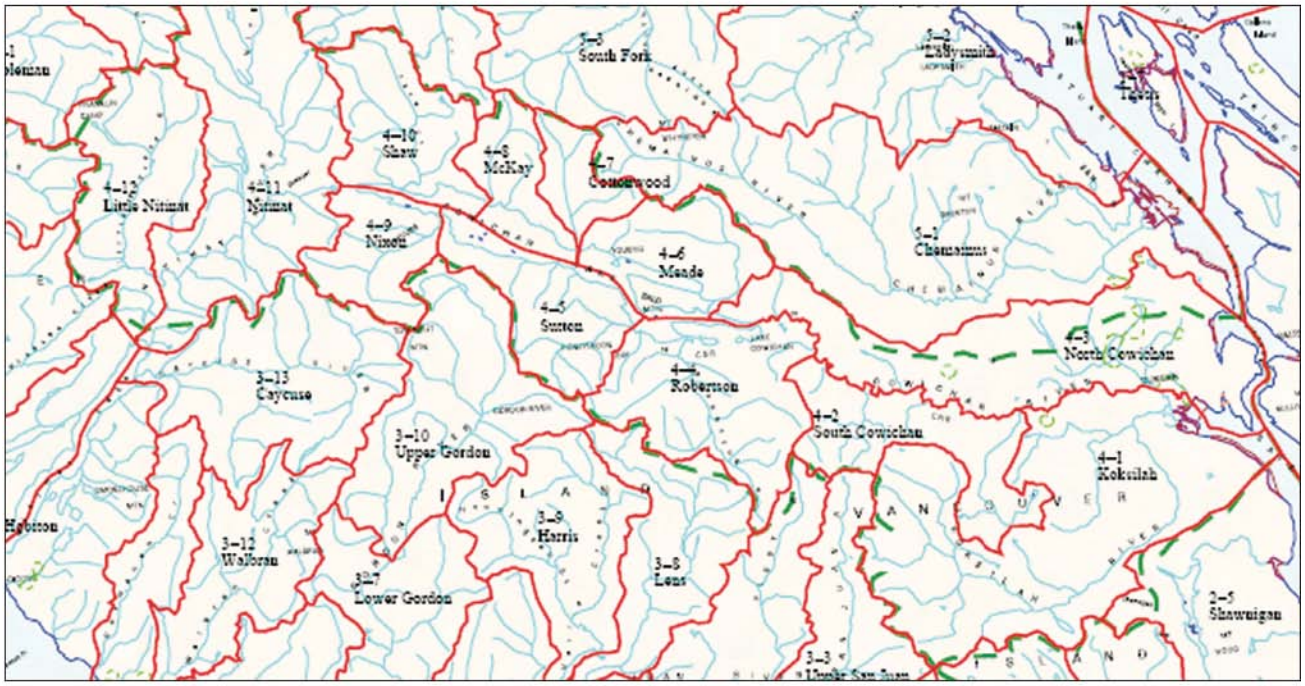


FIGURE 2.19: Location of population sub-units for Roosevelt elk, relevant to the CVRD



Source: Kim Brunt, Ministry of Environment.

Table 2.8: Number of elk estimated for each population subunit

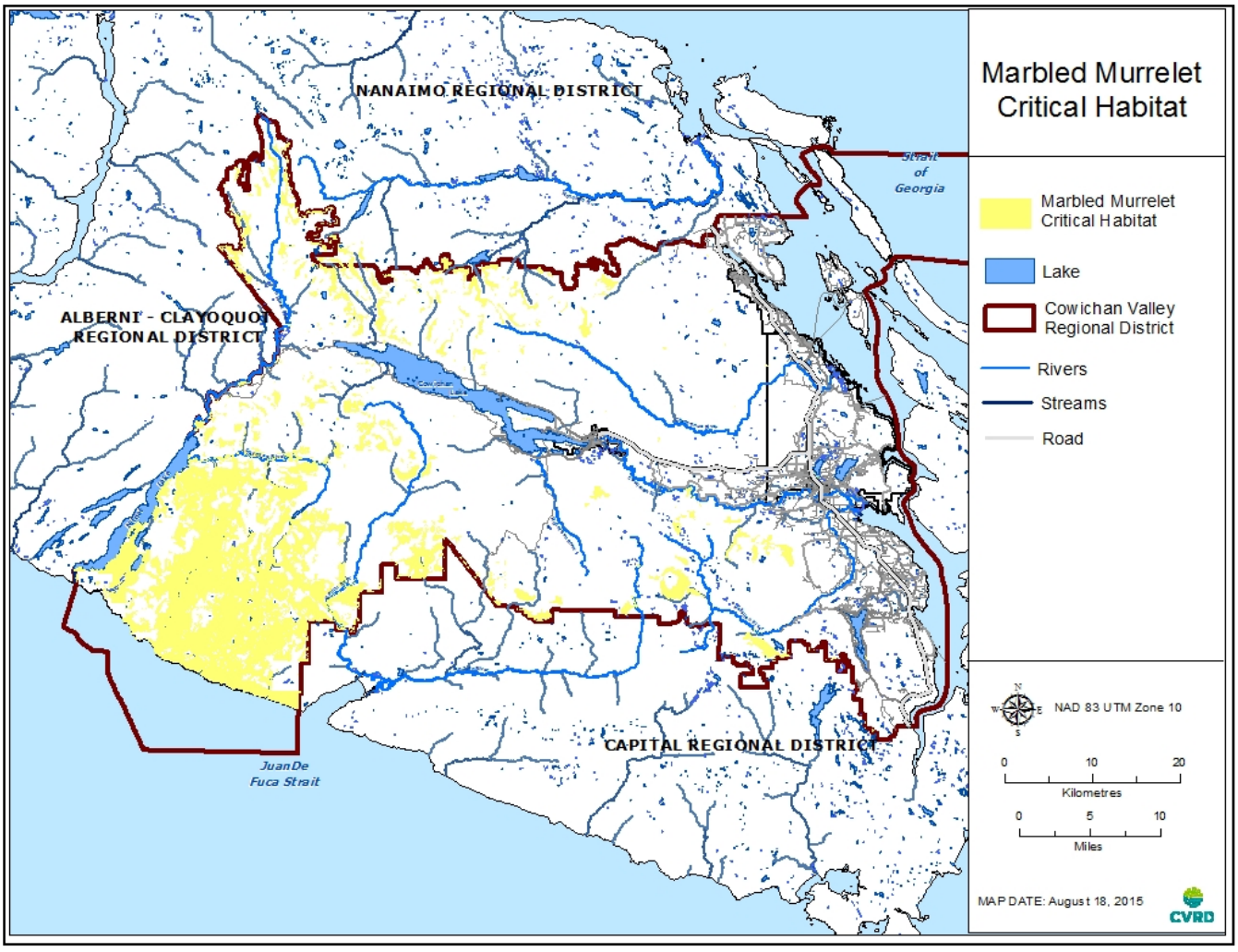
Area	Sub Population	Name	Area (km^2)	Estimated No. Elk	% Local Population	% Total Population
4	1	Koksilah	317	10	2	0.6
4	2	South Cowichan	118	15	3	0.9
4	3	North Cowichan	198	50	12	2.9
4	4	Robertson	158	10	2	0.6
4	5	Sutton	110	5	1	0.3
4	6	Meade	88	20	5	1.2
4	7	Cottonwood	50	40	9	2.3
4	8	McKay	44	60	14	3.5
4	9	Nixon	76	5	1	0.3
4	10	Shaw	92	175	41	10.2
4	11	Nitinat	326	30	7	1.7
4	12	Little Nitinat	139	10	2	0.6
		Total	1716	430	100	25.1

Marbled Murrelet

The marbled murrelet is federally listed as threatened under Schedule 1 of SARA and is provincially blue-listed (BC CDC 2015). Marbled murrelet have been recorded in most inshore marine areas of BC (RIC 2001), often within 0.5 km of shore. They use inland old-growth forests for nesting habitat (Burger 1995) and typically nest on large, mossy limbs in the canopy of large (>30 m) conifers in old-growth (>250 years old) forests (Environment Canada 2014). Marbled murrelet seasonally shift their distribution from northern and outer coasts in winter to southern and inland waters in summer (Fraser et al. 1999; RIC 2001; CMMRT 2003).

Environment Canada has spatially identified and mapped nesting critical habitat for marbled murrelet for six conservation regions in BC (Environment Canada 2014). The CVRD occurs within the East Vancouver Island and the West and North Vancouver Island conservation regions of which there are an estimated 77,038 hectares and 256,081 hectares, respectively, of nesting critical habitat – based on regional habitat estimates for 2011 (Environment Canada 2014). There are an estimated 53,572 hectares of nesting critical habitat within the CVRD (Figure 2.20). The majority of this critical habitat is located in the western portions of the CVRD primarily centered on the Carmanah Valley.

FIGURE 2.21: Marbled Murrelet Critical Habitat within the CVRD



Northern Goshawk

The northern goshawk *laingi* subspecies, herein northern goshawk, is endemic to BC occurring on Vancouver Island, Haida Gwaii and the coastal mainland west of the Coast Mountains (COSEWIC 2013). The northern goshawk is listed as threatened under COSEWIC and SARA and is red-listed in BC (BC CDC 2015). The northern goshawk primarily occurs in mature and old coastal rainforests and is considered an indicator species of these habitats. Large volume trees and closed canopies are key habitat features for northern goshawk (McLaren 2000; COSEWIC 2013).

Based on habitat supply models, there are an estimated 1,000 mature northern goshawk individuals occurring in BC with 390-454 occurring on Vancouver Island (COSEWIC 2003).These animals appear to be widely distributed based on the availability of preferred habitat features (Either 1999; McLaren 2000). McLaren (2000) completed a population inventory of northern goshawk on Vancouver Island covering 37,856 ha and documented the occurrence of 19 northern goshawk territories. The highest proportion of these detections (51%) occurred in continuous old-growth (>250 years old) forest. McLaren (2000) note that nest trees occurred in a wide variety of tree species with the key feature being that these trees were large in diameter.

No inventories of northern goshawk have been made specifically within the CVRD. However, northern goshawk are known to occur within the CVRD based on inventories across Vancouver Island (Either 1999; McLaren 2000; McLaren 2003). Based on a broad interpretation of availability of habitat within the CVRD there are 61,200 ha (Table 2.3) of moist to wet old-growth forest (>140 years old) within the CVRD that could provide potential habitat (foraging and nesting) for northern goshawk. Smith and Sutherland (2008) produced habitat capability maps for the entire Vancouver Island Conservation Region for northern goshawk and note that 35% of potential habitat on the landscape supports suitable foraging habitat (which often encompasses nesting habitat). Using this as a guide, 21,420 ha within the CVRD is likely to support suitable northern goshawk habitat. McLaren (2000) surveyed 16,705 ha of continuous old growth forest on Vancouver Island and detected 18 northern goshawk territories (1 territory per 928 ha). Thus, the 21,420 ha of suitable northern goshawk habitat within the CVRD is likely to support 23 northern goshawk territories.

This estimate of available suitable habitat is likely an over estimate as it includes low quality habitat as well as small, less intact forest stands. However, it does provide for a context for the potential number of northern goshawk territories that may occur within the CVRD – though it should be noted that annual occupancy rates are expected to fluctuate between 70.1 and 74.7% (McLaren 2000). McLaren (200) also note that as the quantity and quality of old-growth forest decrease so too will the quantity and quality of northern goshawk habitat.

Plants and Ecological Communities at Risk

The BC CDC identifies a total of 62 plant species that are either red- or blue-listed, and are found or are likely to be found within the CVRD (Table 2.9). This includes 33 blue-listed species and 29 red-listed species. Of these, one – Macoun's meadowfoam (*Limnanthes macounii*) – is solely endemic to Vancouver Island (Figure 2.21). Many of the plants of concern are associated with "at risk" or sensitive ecosystems (Section 2.2) such as Garry oak communities and shoreline systems.

TABLE 2.9: Number of plant species at risk in the CVRD

Group	Class	Blue	Red	Total
Non-vascular Plants		7		7
Vascular Plants	Conifer	1		1
	Dicotyledons	17	27	44
	Ferns	1		1
	Monocotyledons	6	2	8
	Quillworts	1		1
	Total	33	29	62

Ecological Communities

In addition to the individual plants and animals at risk, 89 ecological communities are also identified as at risk within the CVRD: 37 are blue-listed, and 52 are red-listed (BC CDC 2015). Many of these are associated with CDF and CWH ecosystems (see Section 2.2). Forty-three of the 89 at-risk ecological communities are associated with CDF ecosystems, with 14 blue-listed and 29 red-listed ecological communities, including the Garry oak- and arbutus-dominated systems.

Ecological communities at risk within the CVRD also include a variety of riparian ecosystems including the Sitka spruce/false lily-of-the-valley ecosystem which occurs on the outer west coast on infrequently flooded riparian benches. These Sitka spruce/false lily-of-the-valley ecosystems are highly productive and support the growth of very large trees. This impressive ecosystem is now red-listed across its range as a result of forest harvesting. There are also 18 wetland (marsh, swamp, fen and bog) associated ecological communities and two grassland ecosystems identified as at-risk within the CVRD.

FIGURE 2.21: Macoun's meadowfoam

Source: www.ubcbotanicalgarden.org

Protection of Species at Risk

The identification of a plant, an animal or an ecological community as “at risk” in BC does not necessarily confer protection. However, there are both provincial and federal legislation that can afford protection to species at risk and their habitat. For example, under SARA, it is required that a recovery strategy be prepared for all species identified as endangered or threatened. This recovery strategy must include the identification of the species' critical habitat and proposed measures for protecting this critical habitat. A recovery strategy for the marbled murrelet had delineated 333,119 ha of critical habitat on Vancouver Island (Environment Canada 2014) which is protected under SARA.

The *Migratory Birds Convention Act* is a federal act, which applies to all of Canada, including federal, provincial, Aboriginal, and private lands. Under the *Migratory Birds Convention Act*, the Migratory Birds Regulations prohibit deliberate harm to migratory birds, and incidental destruction, disturbance or taking of their nests, shelters or eggs, as well as possession of live birds, nests or eggs.

The BC *Wildlife Act* regulates the management of wildlife in BC. It restricts the harvest of individuals and prohibits the killing, capture, and harassment of wildlife, except by permit or regulation. This Act also provides protection for active bird nests, including specific measures for raptors and their habitats. Section 34 of the *Wildlife Act* specifically prohibits the disturbance or destruction of any bird, its active nest, or its eggs. It also protects the nest of any eagle, peregrine falcon, gyrfalcon, osprey, heron, or burrowing owl, regardless of whether it is actively used.

Ecological communities, such as the massive riparian Sitka-spruce forests, are not protected from harvesting provincially, even if they are identified as red- or blue-listed, unless the decision is made to do so voluntarily.

Summary

The CVRD has a high density of animals, plants and ecological communities that are identified as at-risk. This is primarily a result of the natural diversity of the region – some of the wettest and some of the driest ecosystems in the province occur in the CVRD – combined with its long history of development.

Missing Information

For many species at risk occurring within the CVRD, the specific locations and habitat requirements are unknown. This makes protection difficult, even when there is the will to do so. For other species, the lack of regulations makes identification and maintenance of habitat difficult as development or harvesting continues.

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Appendix A: Full List of Known Species at Risk within the CVRD

Group	Common Name	Scientific Name	COSEWIC	BC CDC	SARA
Amphibians and Reptiles					
	northern red-legged frog	*Rana aurora*	SC (May 2015)	Blue	1-SC (Jan 2005)
	painted turtle - Pacific Coast population	*Chrysemys picta* pop. 1	E (Apr 2006)	Red	1-E (Dec 2007)
	sharp-tailed snake	*Contia tenuis*	E (Nov 2009)	Red	1-E (Jun 2003)
	wandering salamander	*Aneides vagrans*	SC (May 2014)	Blue	
	western toad	*Anaxyrus boreas*	SC (Nov 2012)	Blue	1-SC (Jan 2005)
Birds					
	band-tailed pigeon	*Patagioenas fasciata*	SC (Nov 2008)	Blue	1-SC (Feb 2011)
	barn owl	*Tyto alba*	T (Nov 2010)	Red	1-SC (Jun 2003)
	barn swallow	*Hirundo rustica*	T (May 2011)	Blue	
	black swift	*Cypseloides niger*	E (May 2015)	Blue	
	Cassin's auklet	*Ptychoramphus aleuticus*	SC (Nov 2014)	Blue	
	common nighthawk	*Chordeiles minor*	T (Apr 2007)	Yellow	1-T (Feb 2010)
	double-crested cormorant	*Phalacrocorax auritus*	NAR (May 1978)	Blue	
	Great Blue Heron, *fannini* subspecies	*Ardea herodias fannini*	SC (Mar 2008)	Blue	1-SC (Feb 2010)
	Green Heron	*Butorides virescens*		Blue	
	Marbled Murrelet	*Brachyramphus marmoratus*	T (May 2012)	Blue	1-T (Jun 2003)
	Northern Goshawk, *laingi*	*Accipiter gentilis laingi*	T (Apr 2013)	Red	1-T (Jun 2003)

Group	Common Name	Scientific Name	COSEWIC	BC CDC	SARA
	Northern Pygmy-Owl, *swarthi* subspecies	*Glaucidium gnoma swarthi*		Blue	
	Olive-sided Flycatcher	*Contopus cooperi*	T (Nov 2007)	Blue	1-T (Feb 2010)
	Peregrine Falcon, *anatum* subspecies	*Falco peregrinus anatum*	SC (Apr 2007)	Red	1-SC (Jun 2012)
	Peregrine Falcon, *pealei* subspecies	*Falco peregrinus pealei*	SC (Apr 2007)	Blue	1-SC (Jun 2003)
	Purple Martin	*Progne subis*		Blue	
	Short-eared Owl	*Asio flammeus*	SC (Mar 2008)	Blue	1-SC (Jul 2012)
	Tufted Puffin	*Fratercula cirrhata*		Blue	
	Vesper Sparrow, *affinis* subspecies	*Pooecetes gramineus affinis*	E (Apr 2006)	Red	1-E (Dec 2007)
	Western Screech-Owl, *kennicottii* subspecies	*Megascops kennicottii kennicottii*	T (May 2012)	Blue	1-SC (Jan 2005)
	White-tailed Ptarmigan, *saxatilis* subspecies	*Lagopus leucura saxatilis*		Blue	
Fish					
	Cowichan Lake Lamprey	*Entosphenus macrostomus*	T (Nov 2008)	Red	1-T (Jun 2003)
	Cutthroat Trout, *clarkii* subspecies	*Oncorhynchus clarkii clarkii*		Blue	
	Northern Abalone	*Haliotis kamtschatkana*	T (May 2000)	Red	1-T (Jun 2003)
Invertebrates					
	Autumn Meadowhawk	*Sympetrum vicinum*	Henigman	Blue	
	Black Gloss	*Zonitoides nitidus*		Blue	
	Blue Dasher	*Pachydiplax*		Blue	

Group	Common Name	Scientific Name	COSEWIC	BC CDC	SARA
		longipennis			
	Blue-grey Taildropper	*Prophysaon coeruleum*	E (Apr 2006)	Red	1-E (Dec 2007)
	Boisduval's Blue, *blackmorei* subspecies	*Plebejus icarioides blackmorei*		Blue	
	Broadwhorl Tightcoil	*Pristiloma johnsoni*		Blue	
		Cercyonis pegala incana		Red	
	Clodius Parnassian, *claudianus* subspecies	*Parnassius clodius claudianus*		Blue	
	Common Ringlet, *insulana* subspecies	*Coenonympha tullia insulana*		Red	
	Common Wood-nymph, *incana* subspecies			Red	
	Dromedary Jumping-slug	*Hemphillia dromedarius*	T (May 2014)	Red	1-T (Jan 2005)
	Dun Skipper	*Euphyes vestris*	T (Apr 2013)	Red	1-T (Jun 2003)
	Edith's Checkerspot, *taylori* subspecies	*Euphydryas editha taylori*	E (May 2011)	Red	1-E (Jun 2003)
		Galba vancouverensis		Red	
	Greenish Blue, *insulanus* subspecies	*Plebejus saepiolus insulanus*	E (May 2012)	Red	1-E (Jun 2003)
	Johnson's Hairstreak	*Callophrys johnsoni*		Red	
	Oregon Forestsnail	*Allogona townsendiana*	E (Apr 2013)	Red	1-E (Jan 2005)
	Monarch	*Danaus plexippus*	SC (Apr 2010)	Blue	1-SC (Jun 2003)

Group	Common Name	Scientific Name	COSEWIC	BC CDC	SARA
	Moss' Elfin, *mossii* subspecies	*Callophrys mossii mossii*		Blue	
	Pacific Sideband	*Monadenia fidelis*		Blue	
	Propertius Duskywing	*Erynnis propertius*		Red	
	Threaded Vertigo	*Nearctula* sp. 1	SC (Apr 2010)	Red	1-SC (Jul 2012)
	Scarletback Taildropper	*Prophysaon vanattae*		Blue	
	Sinuous Snaketail	*Ophiogomphus occidentis*		Blue	
	Umbilicate Sprite	*Promenetus umbilicatellus*		Blue	
	Warty Jumping-slug	*Hemphillia glandulosa*	SC (Apr 2013)	Blue	1-SC (Jan 2005)
	Western Branded Skipper, *oregonia* subspecies	*Hesperia colorado oregonia*	E (Nov 2013)	Red	
	Western Pine Elfin, *sheltonensis* subspecies	*Callophrys eryphon sheltonensis*		Blue	
	Western Pondhawk	*Erythemis collocata*		Blue	
	Western Thorn	*Carychium occidentale*		Blue	
	Zerene Fritillary, *bremnerii* subspecies	*Speyeria zerene bremnerii*		Red	
Mammals					
	Roosevelt elk	*Cervus elaphus roosevelti*		Blue	
	steller sea lion	*Eumetopias jubatus*	SC (Nov 2013)	Blue	1-SC (Jul 2005)
	Townsend's big-eared bat	*Corynorhinus townsendii*		Blue	
	ermine, *anguinae* subspecies	*Mustela erminea anguinae*		Blue	

Group	Common Name	Scientific Name	COSEWIC	BC CDC	SARA
	Keen's myotis	*Myotis keenii*	DD (Nov 2003)	Blue	3 (Mar 2005)
	Vancouver Island marmot	*Marmota vancouverensis*	E (Mar 2008)	Red	1-E (Jun 2003)
	wolverine, *vancouverensis* subspecies	*Gulo gulo vancouverensis*	SC (May 2014)	Red	
	American water shrew, *brooksi* subspecies	*Sorex palustris brooksi*		Red	

NOTE:
BC List Status:
Red – extirpated, endangered, or threatened
Blue – special concern
Yellow – not at risk
COSEWIC Status:
C –candidate: species short-listed for future assessment
NAR – not at risk
SC – special concern: species sensitive to human activities or vulnerable to natural events
T – threatened: species likely to become endangered
E – endangered: species facing imminent extirpation or extinction
SARA status definitions the same as COSEWIC

Search Type:

Search 1: Plants & Animals
AND BC Conservation Status:Red (Extirpated, Endangered, or Threatened) OR Blue (Special Concern)
AND Regional Districts: Cowichan Valley (CVRD)

Search 2: Plants & Animals
AND SARA Schedule 1 Status:True
AND Regional Districts: Cowichan Valley (CVRD)

Search 3: Plants & Animals
AND COSEWIC Status:Endangered OR Threatened OR Special Concern
AND Regional Districts: Cowichan Valley (CVRD)