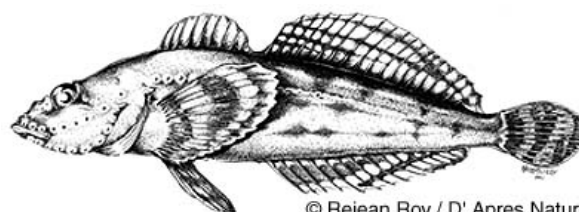




Phantom Orchid (from: <http://www.sccp.ca/>)



Coastal Giant Salamander (from: <http://www.sccp.ca/>)



Cultus Pygmy Sculpin (from: <http://www.sararegistry.gc.ca>)

© Rejean Roy / D' Apres Nature

Acknowledgements

This draft document was produced by the Project Team for the Chilliwack River Watershed Strategy as part of the Issues and Alternatives phase of the project. The following individuals are thanked for their invaluable contributions of time and information, which was used in the development of this document:

- Sylvia Letay, MOE (Project Lead)
- Kym Welstead, MOE
- Lance Lilley, FVRD
- Krista Englund, FVRD

This acknowledgement is solely intended to recognize the numerous individuals who contributed to the preparation of this document. These individuals are not responsible for the information or the recommendations made within the document, and the document does not necessarily reflect the opinions or views of all of these individuals. The report is a product of the CRWS Project Team, and it is the Project Team that is ultimately responsible for this document. All feedback should be directed at them and not to the individuals acknowledged above.

Table of Contents

1.0	General Description of the Issue	4
2.0	Species at Risk in the Chilliwack River Watershed	4
3.0	Relevant Legislation	9
4.0	Current Strategies and Policies for Management.....	9
5.0	Useful Tools and Information Sources	10
6.0	Recommendations	11
	Appendix A: Species-at-Risk in Chilliwack River Watershed	13
	Appendix B: Guidelines for Dealing with Development Effects on Species and Ecosystems at Risk on the South Coast of British Columbia (Working Draft)	19

Chilliwack River Watershed Strategy Issues & Alternatives: *Species at Risk/Biodiversity*

1.0 General Description of the Issue

Those of us who are fortunate enough to live in BC already know the amazing diversity of our natural environment. For example, three-quarters of Canada's mammal species are found in British Columbia, and 24 of those species are exclusive to our province. Over 250 bird species breed in the province, 162 of those (55%) breed nowhere else in Canada. Invertebrate species probably number between 50,000 and 70,000, including 35,000 species of insects. British Columbia has an estimated 2,790 native vascular plants species, (nearly 27% are considered species at risk). Approximately 1,000 bryophytes (mosses and liverworts), 1,600 lichens, 522 species of attached algae and well over 10,000 species of fungi are present in the province.¹

Unfortunately, habitat loss or destruction, invasive species, and overharvesting continues to threaten the long-term survival of many of these species. In BC, over 58 species are ranked as either extinct (no longer living anywhere) or presumed or possibly extirpated (no longer living in BC).² These species include passenger pigeon, greater sage-grouse, Dawson caribou, wolverine (*vancouverensis* subspecies), gopher snake (*catenifer* subspecies), western pond turtle, pigmy short-horned lizard, and coastal bluegrass.

2.0 Species at Risk in the Chilliwack River Watershed

The Chilliwack River Watershed supports a rich diversity of flora and fauna, including numerous species-at-risk, due to the large expanse of relatively in-tact wilderness within the watershed as well as the variety of elevations and habitat types available. The two primary ecological zones found within the watershed are the Coastal Western Hemlock zone, which probably encompasses the greatest biological diversity and abundance of any zone in BC (supporting a variety of wildlife from coastal-nesting birds to Pacific anadromous salmon)³ and the Mountain Hemlock zone. Habitat types include old growth forest, mature forest, alpine meadows, rocky slopes, glaciers, riparian, wetlands, off-channel, streams, lakes, settlement areas, caves, etc.

The Chilliwack River Watershed lies within the Chilliwack Forest District, which currently supports nearly 200 identified species at risk (Appendix A). Figure 1 depicts the known presence of some key species-at-risk within the Chilliwack River Watershed.

Plants

¹ To learn more about the Biological Diversity of BC, please visit: <http://www.env.gov.bc.ca/wld/bio.htm>.

² David Suzuki Foundation Table of Extinct and Extirpated Species. Available at: http://www.davidsuzuki.org/files/Conservation/Table_of_Extinct_and_Extirpated_Species.pdf (accessed June 24, 2008).

³ Egan, B. 1999. The ecology of the Coastal Western Hemlock Zone. B.C. Ministry of Forests, Victoria, B.C. Available at: <http://www.for.gov.bc.ca/hre/becweb/publications-becpubslist.htm>. Accessed August 17, 2005.

The Chilliwack River Watershed is rich in botanical diversity due to the variety of habitat types and differences in ecological communities and elevation. There are also several rare plant communities and species within the watershed. Cliff paintbrush is a red-listed species of wildflower associated with alpine meadows found on Mount Lindeman and Mount Cheam. Tall bugbane is recognized and protected as an endangered species under the federal *Species at Risk Act* (SARA). It is found in association with several of the watersheds' drainages. The phantom orchid is another red-listed species listed as threatened under SARA. The watershed also contains a number of Provincial blue-listed species of plants, including Cascade parsley fern, short-fruited smelowskia (also known as alpine false candytuft), and alpine anemone.¹

Wildlife

There are over 20 reptiles and amphibians, 130 bird species, and 40 mammal species recorded for the Chilliwack River Watershed, including the endangered North Cascades grizzly bear, Roosevelt elk, black-tailed deer, mountain goat, black bear, cougar, bald eagle, osprey, and screech owl.² The location of deer and goat winter range habitat within the Chilliwack River Watershed is shown in Figure 2.

Red-listed species include mountain beaver, Pacific giant salamander, Oregon forestsnail, marbled murrelet, Pacific watershrew, long-tailed weasel, red-legged frog, and Keen's long-eared bat. Blue-listed species include tailed frog, green-backed heron, great blue heron, turkey vulture, black-chinned hummingbird, Townsend's big-eared bat and painted turtle.

Fish

The Chilliwack River system supports a wide variety of fish species, including cutthroat trout, rainbow trout, Rocky Mountain whitefish, Dolly Varden char, bull trout, sculpin, Salish sucker, and all six pacific salmon species: chinook, sockeye, pink, chum, coho, and steelhead. Bull trout is a blue-listed species in British Columbia and is considered vulnerable. The Provincial red-listed Salish sucker has also been listed as endangered by both the Committee for the Status of Endangered Wildlife in Canada (COSEWIC) and federal Species at Risk legislation. This species has been recorded in small numbers within Salwein Creek and Street Creek. The watershed also contains the only known

¹ Red and blue listings are compiled by the BC Conservation Data Centre based on a standard set of criteria (including population numbers, population trends, distribution, actual or potential threats, etc). The Red list includes species that have been legally designated as Endangered or Threatened under the Wildlife Act, are extirpated, or are candidates for such designation. Extirpated taxa no longer exist in the wild in British Columbia, but do occur elsewhere. Endangered taxa are facing imminent extirpation or extinction. Threatened taxa are likely to become endangered if limiting factors are not reversed. Not all Red-listed taxa will necessarily become formally designated.

The Blue List includes species not immediately threatened, but of concern because of characteristics that make them particularly sensitive to human activities or natural events. (BC Ministry of Environment Website, <http://www.gov.bc.ca/env/>, accessed June 24, 2008).

² Litke, S. 1997. Chilliwack Community Snapshot: A profile of the natural features, human uses and states of the Elk Creek and Ryder Creek Watersheds. Watershed Alliance of British Columbia. Ministry of Water, Land and Air Protection. 2005. BC Water Resources Atlas. Available at: <http://srmaps.gov.bc.ca/apps/wrbc/>. Accessed September 29, 2005.

living specimens of the Cultus pygmy sculpin, a small and unique fish listed as threatened under COSEWIC and SARA.

Salmon productivity in the watershed is largely dependent on freshwater habitat conditions, hatchery production, harvest levels, and ocean habitat conditions. All salmon species have suffered population declines, but some have shown signs of recovery. After dramatic habitat losses in the late nineteenth and early twentieth centuries, freshwater habitat conditions within the Chilliwack River Watershed began to stabilize over the past twenty years as fire damaged and logged forests have begun to recover.¹ Active fish habitat restoration programs in the Watershed begun in the early 1980's and continuing today have accelerated the recovery of damaged fish habitats. Many of the fish populations in the Chilliwack River are now moving in a positive direction; however, there is still concern over the status of some species (e.g., Salish sucker, Cultus Lake sockeye salmon, wild coho salmon, and native spring Chinook salmon). Further efforts are needed to recover lost and damaged fish habitat within the Watershed that support these populations.

Additional information about the status and population trends of salmonid populations in the Chilliwack River Watershed is provided in the CRWS Background Report (available online at: <http://www.chilliwackwatershedstrategy.ca/background.html>).

¹ Foy, M. Fisheries and Oceans Canada. Pers. comm.

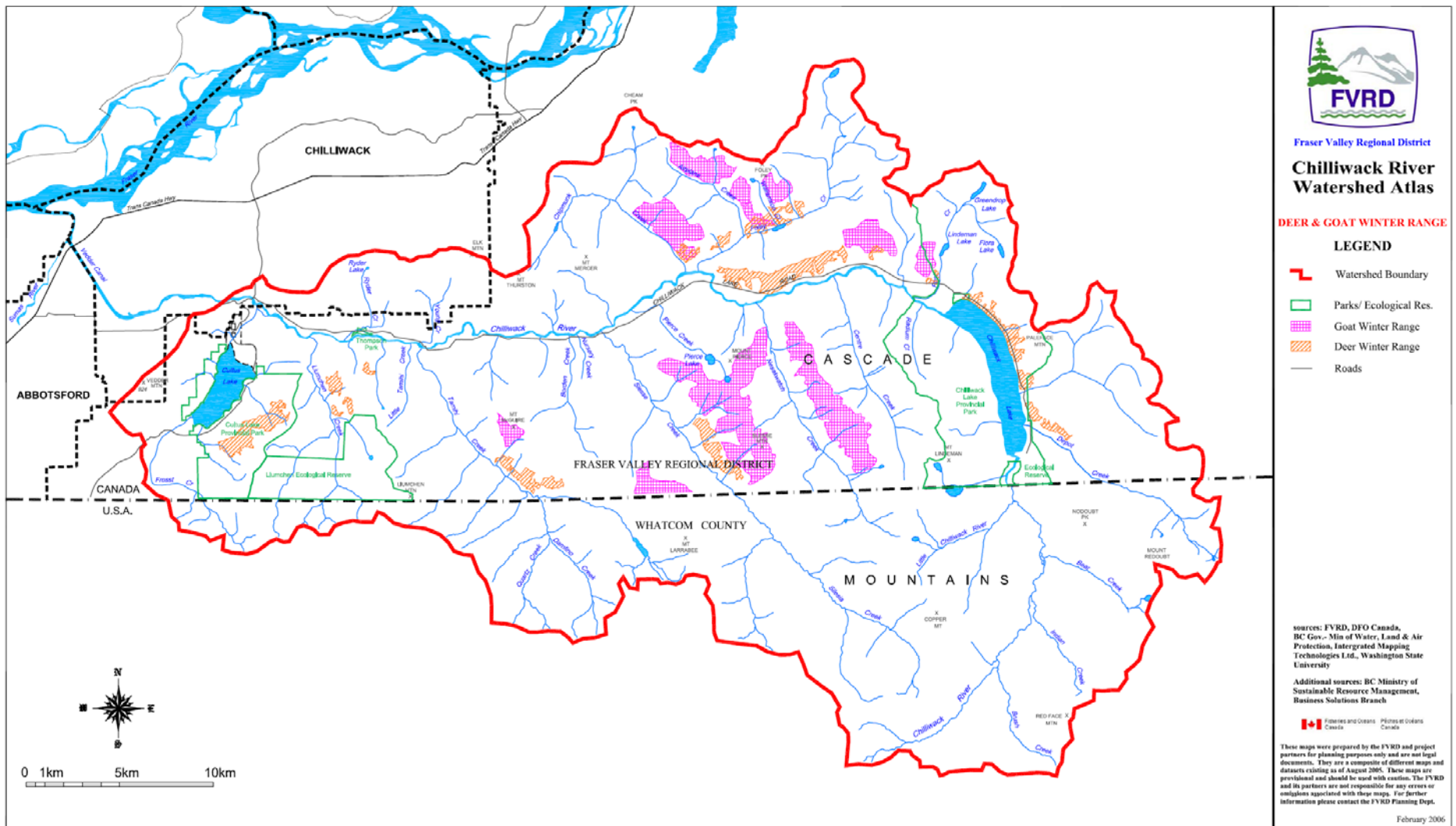


Figure 2. Deer and Goat Winter Range habitat identified within the Chilliwack River Watershed (February 2006)

3.0 Relevant Legislation

In recognition of the need for species and ecosystems conservation in Canada, the Federal Species at Risk Act (SARA) was proclaimed in June 2003, and is one part of a three part Government of Canada strategy for the protection of wildlife species at risk. The purposes of the Species at Risk Act (SARA) are to prevent wildlife species from being extirpated or becoming extinct, to provide for the recovery of extirpated, endangered and threatened species, and to manage species of special concern to prevent them from becoming endangered or threatened. This three part strategy also includes commitments under the Accord for the Protection of Species at Risk and activities under the Habitat Stewardship Program for Species at Risk.⁷

Most of British Columbia's 95 million hectares are publicly owned. For this reason, the public has input into decisions about how this land is used. In the Chilliwack River Valley the majority of species at risk occur on Provincial Crown Lands, and where Crown Lands are managed for Forestry, the Forest and Range Practices Act (FRPA) and its regulations govern the activities of forest and range licensees in B.C. Under FRPA, before conducting any activities like logging or road building, a licensee must prepare a Forest Stewardship Plan or a Woodlot Licence Plan. By law, these plans must be made available for public review and comment. Generally, a licensee must advertise that the plan is available, and allow at least 60 days for input. This process allows the public, First Nations, and those whose activities might be affected by timber harvesting activities to provide input on these plans.⁸

4.0 Current Strategies and Policies for Management

The BC Ministry of Environment is undertaking Recovery Planning for numerous species and ecosystems at risk. The goal of recovery planning is to help arrest or reverse the decline of a species, to identify priority actions to ensure the survival and recovery of species and ecosystems at risk, and to reduce or remove the threats to the long-term persistence of species and ecosystems. Recovery of a species can range from maintenance of current population size and distribution (survival) to fully restoring the species as a viable, self-sustaining population (recovery).⁹

Accurate information about species and ecological communities at risk is essential in order to manage and protect these entities. In recognition of this fact, the Conservation Data Centre (CDC) was established in 1991 as a joint project of the Ministry of Environment, the Nature Trust of B.C., the Nature Conservancy of Canada and USA. Information on species and ecological communities at risk which would otherwise take a great deal of time and expense to gather is available from one source at the CDC. The

⁷ To learn more about SARA and search for information about individual species, please visit: http://www.sararegistry.gc.ca/approach/act/default_e.cfm.

⁸ To learn more about FRPA and how you can provide review and comment on Forestry related Plans, please visit: <http://www.for.gov.bc.ca/code/>. To learn how wildlife and species at risk are managed under FRPA please visit: <http://www.for.gov.bc.ca/code/wildlife.htm>.

⁹ To learn more about Recovery Planning in BC, please visit: <http://www.env.gov.bc.ca/wld/recoveryplans/rcvry1.htm>.

Centre collects and assembles information from museums, herbaria, universities, published and unpublished reports, theses, scientists, natural history groups and the ongoing work of its own staff and contractors.¹⁰

In addition to recovery planning and information management, the Province utilizes Best Management Practices (BMPs) to assist with the management of species and their habitats. Best Management Practices and Guideline documents have been prepared¹¹ to help all citizens and stakeholders to act as stewards of the environment. The information in these documents will help to ensure that proposed development activities are planned and carried out in compliance with the various legislation, regulations, and policies that apply to proposed activities. These BMPs and Guideline documents can have a provincial and/or regional context. Provincial documents apply to the entire province but may contain region specific sections. Regional documents have been developed for a specific purpose and may not be applicable to other regions.

5.0 Useful Tools and Information Sources

Provincial Red and Blue Lists highlight species and ecological communities that have particular threats, declining population trends, or restricted distributions that indicate that they require special attention. These lists serve as a practical method to assist in making conservation and land-use decisions and in prioritizing research, inventory, management, and protection activities. The following link: <http://a100.gov.bc.ca/pub/eswp/> will jump you directly to the BC Species and Ecosystems Explorer where you can easily find:

- Provincial species and ecological communities,
- Red and Blue listed species/ecological communities,
- All ecological communities and Red- and Blue-listed species by Forest District, Biogeoclimatic unit, Ministry of Environment Region or Regional District,
- Species and ecological community status,
- Legal designation, distribution, life histories, conservation needs, recovery plans and more.

The Provincial websites contain much information pertaining to species at risk in BC. Of note, the primary website for species at risk through the Ministry of Environment (<http://www.env.gov.bc.ca/atrisk/>) includes detailed information about endangered species and ecological communities (ecosystems) in BC. Users can create lists by species group(s), at risk status, and/or forest district for Red and Blue listed species in British Columbia, and can link to species' summaries and relevant publications and references. This site provides assistance in researching the occurrence of a particular species at risk, knowing what species at risk occur in a given area are under development pressure, and finding out what species live near a particular neighbourhood.

The South Coast Conservation Program (established in 2005) is a multi-partner, landscape-level conservation program for the South Coast (or Lower Mainland) of B.C. The primary objective of this program is to coordinate and facilitate the implementation

¹⁰ To learn more about the CDC please visit: <http://www.env.gov.bc.ca/cdc/about.html>.

¹¹ <http://www.env.gov.bc.ca/wld/BMP/bmpintro.html>.

of conservation actions to maintain and restore species and ecosystems at risk on the South Coast of B.C. Please visit the South Coast Conservation Program website at: <http://www.sccp.ca/>. By clicking on "guidelines", then "best management practices", you can access specific advice for specific species at risk management. Please note that the "Working Draft Guidelines for Dealing with Development Effects on Species and Ecosystems at Risk on the South Coast of British Columbia (Ross Venuesland)" is our primary guidance document to follow. A hard copy of this primary guidance document is also provided as an attachment for your convenience. You may notice that to access some of the documents, you will require a password, so please contact the Ministry of Environment at 604-582-5200 to speak with our Regional Species at Risk Biologist for more information. The SCCP website gets updated periodically, so please drop in often to make sure you have the latest and best information at hand.

6.0 Recommendations

Fundamental to species and ecosystems at risk management is the need to identify, map and monitor where they occur, and to encourage land-use decisions that will ensure their continued integrity over the long term. This is especially true for the Chilliwack River Valley, given our rich diverse natural environment and some of the land use pressures primarily on Crown Land that could potentially threaten species and ecosystems at risk. The Provincial Resources Information Standards Committee (RISC) (<http://ilmbwww.gov.bc.ca/risc/about.htm>) is responsible for establishing standards for natural and cultural resources inventories, including collection, storage, analysis, interpretation and reporting of inventory data and should be used as guidance for undertaking inventory of species and ecosystems in general, where species specific guidance is not yet available from Recovery Teams.

The following recommendations are offered to help inform all environmental stewards and stakeholders of the Chilliwack River Valley:

1. Undertake or promote species and ecosystems at risk inventories or assessments as per the attached "Working Draft Guidelines Dealing with Development Effects on Species and Ecosystems at Risk" (Appendix B) or as per FRPA or other legislated requirements. Appropriate inventories or assessments inform decision-making and facilitate environmental awareness among all British Columbians as well as improve the effectiveness of ecosystem monitoring.
2. Develop biological indicators (groups or types of biological resources) that can assess the biological health condition in the Chilliwack River Watershed and monitor those indicators over time.
3. Develop ecological monitoring programs that can provide information on local changes and desired ecosystem attributes. For long-term monitoring of biodiversity change, information must be comparable over time and by location. The Ecological Monitoring and Assessment Network (EMAN) recommends that monitoring activities

should use standard protocols in study design, sampling procedures, sample and data analysis and reporting methods.¹²

4. Consider and manage for the habitat requirements of all species and ecosystems at risk, and use ecological information and BMPs to facilitate sustainable land use decision-making.

Impact avoidance and mitigation is paramount for ultimate success. All British Columbians have a shared responsibility to protect species at risk and ensure healthy ecosystems for future generations.

¹² For more information, please see: http://www.eman-rese.ca/eman/ecotools/protocols/intro_rec.html.

Appendix A: Species-at-Risk in Chilliwack River Watershed ¹

Name Category	Class (English)	English Name	Scientific Name	BC Status	Habitat Type
Fungus		Oldgrowth Specklebelly	<i>Pseudocyphellaria rainierensis</i>	Red	Terrestrial
Invertebrate Animal	bivalves	California Floater	<i>Anodonta californiensis</i>	Blue	Lacustrine; Riverine
	bivalves	Rocky Mountain Fingernailclam	<i>Sphaerium patella</i>	Red	Lacustrine; Riverine
	bivalves	Winged Floater	<i>Anodonta nuttalliana</i>	Blue	Lacustrine; Riverine
	gastropods	Black Gloss	<i>Zonitoides nitidus</i>	Blue	Palustrine
	gastropods	Northern Tightcoil	<i>Pristiloma arcticum</i>	Blue	Palustrine; Terrestrial
	gastropods	Oregon Forestsnail	<i>Allogona townsendiana</i>	Red	Terrestrial
	gastropods	Pacific Sideband	<i>Monadenia fidelis</i>	Blue	Terrestrial
	gastropods	Pewter Physa	<i>Physella heterostropha</i>	Red	Lacustrine
	gastropods	Puget Oregonian	<i>Cryptomastix devia</i>	Red	Palustrine; Terrestrial
	gastropods	Pygmy Fossaria	<i>Fossaria parva</i>	Blue	Lacustrine; Palustrine
	gastropods	Scarletback Taildropper	<i>Prophysaon vanatta</i>	Blue	Terrestrial
	gastropods	Western Thorn	<i>Carychium occidentale</i>	Blue	Terrestrial
	insects	Audouin's Night-stalking Tiger Beetle	<i>Omus audouini</i>	Red	
	insects	Autumn Meadowhawk	<i>Sympetrum vicinum</i>	Blue	Lacustrine; Riverine
	insects	Beaverpond Baskettail	<i>Epitheca canis</i>	Blue	Lacustrine; Palustrine; Riverine
	insects	Black Petaltail	<i>Tanypteryx hageni</i>	Blue	Palustrine
	insects	Blue Dasher	<i>Pachydiplax longipennis</i>	Blue	Lacustrine; Riverine
	insects	Common Wood-nymph, <i>incana</i> subspecies	<i>Cercyonis pegala incana</i>	Red	Terrestrial
	insects	Dun Skipper	<i>Euphyes vestris</i>	Blue	Palustrine; Terrestrial
	insects	Emma's Dancer	<i>Argia emma</i>	Blue	Lacustrine; Riverine
	insects	Grappletail	<i>Octogomphus specularis</i>	Red	Lacustrine; Riverine
	insects	Hoffman's Checkerspot	<i>Chlosyne hoffmanni</i>	Red	Terrestrial
	insects	Indra Swallowtail	<i>Papilio indra</i>	Red	Palustrine; Terrestrial
	insects	Johnson's Hairstreak	<i>Callophrys johnsoni</i>	Red	Terrestrial
	insects	Monarch	<i>Danaus plexippus</i>	Blue	Palustrine; Terrestrial
	insects	Propertius Duskywing	<i>Erynnis propertius</i>	Blue	Terrestrial
insects	Western Pine Elfin, <i>sheltonensis</i> subspecies	<i>Callophrys eryphon sheltonensis</i>	Blue		
insects	Western Pondhawk	<i>Erythemis collocata</i>	Blue	Lacustrine	
insects	Western River Cruiser	<i>Macromia magnifica</i>	Blue	Lacustrine; Riverine	
Nonvascular Plant		poor pocket moss	<i>Fissidens pauperculus</i>	Red	Riverine; Terrestrial
		silver hair moss	<i>Fabronia pusilla</i>	Red	Terrestrial
Vascular Plant	conifers	whitebark pine	<i>Pinus albicaulis</i>	Blue	
	dicots	alpine anemone	<i>Anemone drummondii</i> var. <i>drummondii</i>	Blue	Terrestrial
	dicots	Blue vervain	<i>Verbena hastata</i> var. <i>scabra</i>	Red	Palustrine; Terrestrial
	dicots	blunt-sepaled starwort	<i>Stellaria obtusa</i>	Blue	Palustrine; Riverine; Terrestrial
dicots	Brandegee's lomatium	<i>Lomatium brandegeei</i>	Blue	Terrestrial	

¹ List includes species-at-risk known to occur within the Chilliwack Forest District, of which the Chilliwack River Watershed is only a subset.

dicots	Brewer's monkey-flower	<i>Mimulus breweri</i>	Blue	Palustrine; Riverine; Terrestrial
dicots	California-tea	<i>Rupertia physodes</i>	Blue	Terrestrial
dicots	chaffweed	<i>Anagallis minima</i>	Blue	Estuarine; Palustrine; Terrestrial
dicots	cliff paintbrush	<i>Castilleja rupicola</i>	Red	Terrestrial
dicots	cut-leaved water-parsnip	<i>Berula erecta</i>	Red	Lacustrine; Palustrine
dicots	dotted smartweed	<i>Polygonum punctatum</i>	Blue	Palustrine
dicots	dwarf bramble	<i>Rubus lasiococcus</i>	Blue	Terrestrial
dicots	dwarf groundsmoke	<i>Gayophytum humile</i>	Blue	Palustrine; Terrestrial
dicots	elegant Jacob's-ladder	<i>Polemonium elegans</i>	Blue	Terrestrial
dicots	elmera	<i>Elmera racemosa</i> var. <i>racemosa</i>	Blue	Riverine; Terrestrial
dicots	false-pimpernel	<i>Lindernia dubia</i> var. <i>anagallidea</i>	Blue	Estuarine; Lacustrine; Palustrine; Terrestrial
dicots	farewell-to-spring	<i>Clarkia amoena</i> var. <i>caurina</i>	Blue	Terrestrial
dicots	field dodder	<i>Cuscuta campestris</i>	Blue	
dicots	green parrot's-feather	<i>Myriophyllum pinnatum</i>	Red	Lacustrine; Riverine
dicots	hairy-stemmed willowherb	<i>Epilobium mirabile</i>	Red	Terrestrial
dicots	Hall's willowherb	<i>Epilobium halleanum</i>	Blue	Lacustrine; Palustrine; Riverine; Terrestrial
dicots	Henderson's checker-mallow	<i>Sidalcea hendersonii</i>	Blue	Estuarine; Palustrine
dicots	heterocodon	<i>Heterocodon rariflorum</i>	Blue	Palustrine; Riverine; Terrestrial
dicots	Joe-pye weed	<i>Eupatorium maculatum</i> ssp. <i>bruneri</i>	Red	
dicots	Kellogg's knotweed	<i>Polygonum polygaloides</i> ssp. <i>kelloggii</i>	Blue	Palustrine; Terrestrial
dicots	lance-fruited draba	<i>Draba lonchocarpa</i> var. <i>thompsonii</i>	Blue	Terrestrial
dicots	lance-leaved figwort	<i>Scrophularia lanceolata</i>	Blue	Terrestrial
dicots	leafy mitrewort	<i>Mitella caulescens</i>	Blue	Palustrine; Riverine; Terrestrial
dicots	Menzies' burnet	<i>Sanguisorba menziesii</i>	Blue	Estuarine; Lacustrine; Palustrine; Terrestrial
dicots	Montana lupine	<i>Lupinus arbustus</i> ssp. <i>pseudoparviflorus</i>	Red	Terrestrial
dicots	mountain sneezeweed	<i>Helenium autumnale</i> var. <i>grandiflorum</i>	Blue	Estuarine; Lacustrine; Palustrine; Terrestrial
dicots	Muhlenberg's centaury	<i>Centaurium muehlenbergii</i>	Red	Palustrine
dicots	needle-leaved navarretia	<i>Navarretia intertexta</i>	Red	Palustrine; Riverine; Terrestrial
dicots	Nuttall's sunflower	<i>Helianthus nuttallii</i> var. <i>nuttallii</i>	Red	Palustrine; Terrestrial
dicots	Pacific waterleaf	<i>Hydrophyllum tenuipes</i>	Red	Palustrine; Terrestrial
dicots	pigmyweed	<i>Crassula aquatica</i>	Blue	Estuarine; Lacustrine; Palustrine
dicots	poison oak	<i>Toxicodendron diversilobum</i>	Blue	Terrestrial
dicots	purple-leaved willowherb	<i>Epilobium ciliatum</i> ssp. <i>watsonii</i>	Blue	Estuarine; Palustrine; Terrestrial
dicots	purple-marked yellow violet	<i>Viola purpurea</i> var. <i>venosa</i>	Red	Terrestrial
dicots	riverbank anemone	<i>Anemone virginiana</i> var. <i>cylindroidea</i>	Red	Palustrine; Terrestrial
dicots	rockslide larkspur	<i>Delphinium glareosum</i>	Red	Terrestrial

	dicots	Sawatch knotweed	<i>Polygonum sawatchense</i> ssp. <i>oblivium</i>	Red	Terrestrial
	dicots	scalegod	<i>Idahoia scapigera</i>	Red	Palustrine; Riverine
	dicots	short-fruited smelowskia	<i>Smelowskia ovalis</i>	Blue	Terrestrial
	dicots	silvercrown	<i>Cacaliopsis nardosmia</i>	Red	Terrestrial
	dicots	slender hawksbeard	<i>Crepis atribarba</i> ssp. <i>atribarba</i>	Red	Terrestrial
	dicots	small-flowered bitter-cress	<i>Cardamine parviflora</i> var. <i>arenicola</i>	Red	Terrestrial
	dicots	small-fruited willowherb	<i>Epilobium leptocarpum</i>	Blue	Palustrine; Riverine; Terrestrial
	dicots	smooth douglasia	<i>Douglasia laevigata</i> var. <i>ciliolata</i>	Blue	Terrestrial
	dicots	smooth willowherb	<i>Epilobium glaberrimum</i> ssp. <i>fastigiatum</i>	Blue	Palustrine; Riverine; Terrestrial
	dicots	snow bramble	<i>Rubus nivalis</i>	Red	Terrestrial
	dicots	soft-leaved willow	<i>Salix sessilifolia</i>	Blue	Estuarine; Lacustrine; Palustrine; Terrestrial
	dicots	spring hornwort	<i>Ceratophyllum echinatum</i>	Blue	Lacustrine; Palustrine; Riverine
	dicots	steer's head	<i>Dicentra uniflora</i>	Blue	Riverine; Terrestrial
	dicots	streambank lupine	<i>Lupinus rivularis</i>	Red	
	dicots	tall agoseris	<i>Agoseris elata</i>	Red	Terrestrial
	dicots	tall bugbane	<i>Actaea elata</i>	Red	Terrestrial
	dicots	three-flowered waterwort	<i>Elatine rubella</i>	Blue	Estuarine; Lacustrine; Palustrine
	dicots	Trelease's hybrid willowherb	<i>Epilobium x treleasianum</i>	Blue	
	dicots	Tweedy's lewisia	<i>Lewisia tweedyi</i>	Red	Terrestrial
	dicots	two-edged water-starwort	<i>Callitriche heterophylla</i> ssp. <i>heterophylla</i>	Blue	Estuarine; Lacustrine; Palustrine
	dicots	umbellate starwort	<i>Stellaria umbellata</i>	Blue	Palustrine; Riverine; Terrestrial
	dicots	Ussurian water-milfoil	<i>Myriophyllum ussuriense</i>	Blue	Estuarine; Lacustrine; Palustrine; Riverine
	dicots	Vancouver Island beggarticks	<i>Bidens amplissima</i>	Blue	Palustrine
	dicots	Washington springbeauty	<i>Claytonia washingtoniana</i>	Red	Riverine; Terrestrial
	dicots	water marigold	<i>Megalodonta beckii</i> var. <i>beckii</i>	Blue	Lacustrine; Palustrine; Riverine
	dicots	water-pepper	<i>Polygonum hydropiperoides</i>	Blue	Lacustrine; Palustrine
	dicots	western dogbane	<i>Apocynum x floribundum</i>	Blue	Terrestrial
	dicots	western hawksbeard	<i>Crepis occidentalis</i> ssp. <i>conjuncta</i>	Red	Terrestrial
	dicots	western Jacob's-ladder	<i>Polemonium occidentale</i> ssp. <i>occidentale</i>	Blue	Palustrine; Terrestrial
	dicots	western St. John's-wort	<i>Hypericum scouleri</i> ssp. <i>nortoniae</i>	Blue	Lacustrine; Palustrine; Terrestrial
	dicots	western water-milfoil	<i>Myriophyllum hippuroides</i>	Blue	Lacustrine; Riverine
	dicots	white wintergreen	<i>Pyrola elliptica</i>	Blue	Palustrine; Terrestrial
	dicots	woody-branched rockcress	<i>Arabis lignifera</i>	Blue	Terrestrial
	dicots	yellow marsh-marigold	<i>Caltha palustris</i> var. <i>palustris</i>	Blue	Estuarine; Palustrine
	ferns	Cascade parsley fern	<i>Cryptogramma cascadenis</i>	Blue	Terrestrial
	ferns	corrupt spleenwort	<i>Asplenium adulterinum</i>	Blue	Terrestrial
	ferns	Kruckeberg's holly fern	<i>Polystichum kruckebergii</i>	Blue	Terrestrial

	monocots	Back's sedge	<i>Carex backii</i>	Blue	Lacustrine; Palustrine; Terrestrial
	monocots	beaked spike-rush	<i>Eleocharis rostellata</i>	Blue	Estuarine; Lacustrine; Palustrine; Riverine; Terrestrial
	monocots	bearded sedge	<i>Carex comosa</i>	Red	Lacustrine; Palustrine; Terrestrial
	monocots	bigleaf sedge	<i>Carex amplifolia</i>	Blue	Palustrine; Riverine; Terrestrial
	monocots	Carolina meadow-foxtail	<i>Alopecurus carolinianus</i>	Red	Palustrine; Terrestrial
	monocots	flowering quillwort	<i>Lilaea scilloides</i>	Blue	Estuarine; Palustrine
	monocots	fox sedge	<i>Carex vulpinoidea</i>	Blue	Lacustrine; Palustrine; Terrestrial
	monocots	giant helleborine	<i>Epipactis gigantea</i>	Blue	
	monocots	green-fruited sedge	<i>Carex interrupta</i>	Red	Lacustrine; Palustrine; Terrestrial
	monocots	lakeshore sedge	<i>Carex lenticularis</i> var. <i>lenticularis</i>	Red	Lacustrine; Palustrine
	monocots	little oniongrass	<i>Melica fugax</i>	Red	
	monocots	long-leaved pondweed	<i>Potamogeton nodosus</i>	Red	Lacustrine; Palustrine; Riverine
	monocots	moss grass	<i>Coleanthus subtilis</i>	Red	Lacustrine
	monocots	neat spike rush	<i>Eleocharis nitida</i>	Red	Riverine; Terrestrial
	monocots	nodding semaphoregrass	<i>Pleuropogon refractus</i>	Blue	Palustrine; Terrestrial
	monocots	northern water-meal	<i>Wolffia borealis</i>	Red	Lacustrine; Palustrine; Riverine
	monocots	Nuttall's waterweed	<i>Elodea nuttallii</i>	Blue	Estuarine; Lacustrine; Palustrine
	monocots	Oakes' pondweed	<i>Potamogeton oakesianus</i>	Blue	Lacustrine
	monocots	oniongrass	<i>Melica bulbosa</i> var. <i>bulbosa</i>	Red	Terrestrial
	monocots	phantom orchid	<i>Cephalanthera austiniiae</i>	Red	Terrestrial
	monocots	pointed broom sedge	<i>Carex scoparia</i>	Blue	Lacustrine; Palustrine; Terrestrial
	monocots	pointed rush	<i>Juncus oxymeris</i>	Blue	Estuarine; Palustrine; Terrestrial
	monocots	slender muhly	<i>Muhlenbergia filiformis</i>	Red	Palustrine; Riverine; Terrestrial
	monocots	slender-spiked mannagrass	<i>Glyceria leptostachya</i>	Blue	Estuarine; Lacustrine; Palustrine; Terrestrial
	monocots	small spike-rush	<i>Eleocharis parvula</i>	Blue	Estuarine; Lacustrine; Palustrine
	monocots	stiff-leaved pondweed	<i>Potamogeton strictifolius</i>	Blue	Lacustrine
	monocots	water bur-reed	<i>Sparganium fluctuans</i>	Blue	Lacustrine; Riverine
	quillworts	Nuttall's quillwort	<i>Isoetes nuttallii</i>	Blue	Palustrine; Riverine; Terrestrial
Vertebrate Animal	amphibians	Coastal Tailed Frog	<i>Ascaphus truei</i>	Blue	Palustrine; Riverine; Terrestrial
	amphibians	Oregon Spotted Frog	<i>Rana pretiosa</i>	Red	Lacustrine; Palustrine; Riverine
	amphibians	Pacific Giant Salamander	<i>Dicamptodon tenebrosus</i>	Red	Lacustrine; Riverine; Terrestrial
	amphibians	Red-legged Frog	<i>Rana aurora</i>	Blue	Lacustrine; Palustrine; Riverine; Terrestrial
	birds	American Avocet	<i>Recurvirostra americana</i>	Red	Estuarine; Lacustrine; Palustrine; Riverine; Terrestrial
	birds	American Bittern	<i>Botaurus lentiginosus</i>	Blue	Estuarine; Palustrine

	birds	Band-tailed Pigeon	<i>Patagioenas fasciata</i>	Blue	Palustrine; Terrestrial
	birds	Barn Owl	<i>Tyto alba</i>	Blue	Palustrine; Terrestrial
	birds	Barn Swallow	<i>Hirundo rustica</i>	Blue	Estuarine; Lacustrine; Palustrine; Riverine; Terrestrial
	birds	Burrowing Owl	<i>Athene cunicularia</i>	Red	Terrestrial
	birds	Caspian Tern	<i>Hydroprogne caspia</i>	Blue	Estuarine; Lacustrine; Marine; Palustrine; Riverine; Terrestrial
	birds	Double-crested Cormorant	<i>Phalacrocorax auritus</i>	Blue	Estuarine; Lacustrine; Marine; Palustrine; Riverine; Terrestrial
	birds	Great Blue Heron, fannini subspecies	<i>Ardea herodias fannini</i>	Blue	Estuarine; Lacustrine; Palustrine; Riverine; Terrestrial
	birds	Green Heron	<i>Butorides virescens</i>	Blue	Estuarine; Lacustrine; Palustrine; Riverine
	birds	Horned Lark, merrilli subspecies	<i>Eremophila alpestris merrilli</i>	Blue	Terrestrial
	birds	Horned Lark, strigata subspecies	<i>Eremophila alpestris strigata</i>	Red	Terrestrial
	birds	Lewis's Woodpecker	<i>Melanerpes lewis</i>	Red	Palustrine; Terrestrial
	birds	Lewis's Woodpecker (Georgia Depression population)	<i>Melanerpes lewis</i> pop. 1	Red	Palustrine; Terrestrial
	birds	Marbled Murrelet	<i>Brachyramphus marmoratus</i>	Red	Estuarine; Lacustrine; Marine; Terrestrial
	birds	Peregrine Falcon, anatum subspecies	<i>Falco peregrinus anatum</i>	Red	Estuarine; Terrestrial
	birds	Peregrine Falcon, pealei subspecies	<i>Falco peregrinus pealei</i>	Blue	Estuarine; Lacustrine; Marine; Riverine; Terrestrial
	birds	Pine Grosbeak, carlottae subspecies	<i>Pinicola enucleator carlottae</i>	Blue	Terrestrial
	birds	Purple Martin	<i>Progne subis</i>	Blue	Estuarine; Lacustrine; Palustrine; Terrestrial
	birds	Sandhill Crane	<i>Grus canadensis</i>	Blue	Lacustrine; Palustrine; Riverine; Terrestrial
	birds	Short-eared Owl	<i>Asio flammeus</i>	Blue	Estuarine; Palustrine; Terrestrial
	birds	Spotted Owl	<i>Strix occidentalis</i>	Red	Palustrine; Terrestrial
	birds	Western Bluebird (Georgia Depression population)	<i>Sialia mexicana</i> pop. 1	Red	Palustrine; Terrestrial
	birds	Western Grebe	<i>Aechmophorus occidentalis</i>	Red	Estuarine; Lacustrine; Marine; Palustrine; Riverine
	birds	Western Meadowlark (Georgia Depression population)	<i>Sturnella neglecta</i> pop. 1	Red	Terrestrial
	birds	Western Screech-Owl, kennicottii subspecies	<i>Megascops kennicottii kennicottii</i>	Blue	Palustrine; Terrestrial
	birds	Williamson's Sapsucker, thyroideus subspecies	<i>Sphyrapicus thyroideus thyroideus</i>	Red	Terrestrial
	birds	Yellow-billed cuckoo	<i>Coccyzus americanus</i>	Red	Estuarine; Palustrine; Terrestrial
	birds	Yellow-breasted Chat	<i>Icteria virens</i>	Red	Palustrine; Terrestrial

	mammals	Grizzly Bear	<i>Ursus arctos</i>	Blue	Palustrine; Riverine; Terrestrial
	mammals	Mountain Beaver, <i>rainieri</i> subspecies	<i>Aplodontia rufa rainieri</i>	Blue	Terrestrial
	mammals	Mountain Beaver, <i>rufa</i> subspecies	<i>Aplodontia rufa rufa</i>	Blue	Terrestrial
	mammals	Olympic Shrew	<i>Sorex rohweri</i>	Red	Terrestrial
	mammals	Pacific Water Shrew	<i>Sorex bendirii</i>	Red	Estuarine; Palustrine; Riverine; Terrestrial
	mammals	Snowshoe Hare, <i>washingtonii</i> subspecies	<i>Lepus americanus washingtonii</i>	Red	Palustrine; Terrestrial
	mammals	Southern Red-backed Vole, <i>occidentalis</i> subspecies	<i>Myodes gapperi occidentalis</i>	Red	Palustrine; Terrestrial
	mammals	Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>	Blue	Palustrine; Subterranean; Terrestrial
	mammals	Townsend's Mole	<i>Scapanus townsendii</i>	Red	Terrestrial
	mammals	Trowbridge's Shrew	<i>Sorex trowbridgii</i>	Blue	Palustrine; Terrestrial
	mammals	Western Small-footed Myotis	<i>Myotis ciliolabrum</i>	Blue	Palustrine; Subterranean; Terrestrial
	mammals	Wolverine, <i>luscus</i> subspecies	<i>Gulo gulo luscus</i>	Blue	Terrestrial
	ray-finned fish	Bull Trout	<i>Salvelinus confluentus</i>	Blue	Lacustrine; Riverine
	ray-finned fish	Cultus Pygmy Sculpin	<i>Cottus</i> sp. 2	Red	Lacustrine
	ray-finned fish	Cutthroat Trout, <i>clarkii</i> subspecies	<i>Oncorhynchus clarkii clarkii</i>	Blue	Estuarine; Lacustrine; Marine; Riverine
	ray-finned fish	Dolly Varden	<i>Salvelinus malma</i>	Blue	Estuarine; Lacustrine; Marine; Riverine
	ray-finned fish	Eulachon	<i>Thaleichthys pacificus</i>	Blue	Estuarine; Marine; Riverine
	ray-finned fish	Green Sturgeon	<i>Acipenser medirostris</i>	Blue	Estuarine; Marine; Riverine
	ray-finned fish	Mountain Sucker	<i>Catostomus platyrhynchus</i>	Blue	Riverine
	ray-finned fish	Nooksack Dace	<i>Rhinichthys</i> sp. 4	Red	Riverine
	ray-finned fish	Pygmy Longfin Smelt	<i>Spirinchus</i> sp. 1	Red	Lacustrine
	ray-finned fish	Salish Sucker	<i>Catostomus</i> sp. 4	Red	Lacustrine; Riverine
	ray-finned fish	White Sturgeon (Lower Fraser River population)	<i>Acipenser transmontanus</i> pop.4	Red	Estuarine; Lacustrine; Marine; Riverine
	reptiles	Gopher Snake, <i>catenifer</i> subspecies	<i>Pituophis catenifer catenifer</i>	Red	Palustrine; Terrestrial
	reptiles	Gopher Snake, <i>deserticola</i> subspecies	<i>Pituophis catenifer deserticola</i>	Blue	Lacustrine; Palustrine; Riverine; Terrestrial
	turtles	Western Painted Turtle - Pacific Coast Population	<i>Chrysemys picta</i> pop. 1	Red	Lacustrine; Palustrine; Riverine
	turtles	Western Pond Turtle	<i>Actinemys marmorata</i>	Red	Lacustrine; Palustrine; Riverine; Terrestrial

Appendix B: Guidelines for Dealing with Development Effects on Species and Ecosystems at Risk on the South Coast of British Columbia (Working Draft) ¹

WORKING DRAFT

Guidelines for Dealing with Development Effects on Species and Ecosystems at Risk on the South Coast of British Columbia

Purpose:

The BC Government is committed to a **results based regulatory system** with decisions informed by **best available science**. In the interest of expediting the approval process for developments and providing local governments with appropriate conservation tools, these guidelines attempt to provide clarity around requirements for assessing, avoiding and mitigating impacts to species¹ and ecosystems² at risk during developments.

These guidelines are intended to ensure that development proponents use best available science to:

1. Identify potential occurrences of species and ecosystems at risk in development areas,
2. Conduct appropriate surveys to confirm presence/absence of species and ecosystems at risk, and
3. Avoid or mitigate impacts to species and ecosystems at risk (individuals, residences, and important habitats).

The intent of these guidelines is to be results based. Beyond meeting statutory requirements, proponents may propose alternate approaches, provided that equivalent results are achieved. For details on the roles and responsibilities of the BC Government and Recovery Teams, please see the Appendix 1.

Developments where these Guidelines Apply:

- All terrestrial land developments on private, municipal or regional district lands, excluding small family projects (i.e., those under about 0.25 ha and not involving subdivision), and
- All in-stream or wetland developments on private, municipal or regional district lands, regardless of scale.

Specific Planning Processes where these Guidelines Apply:

- Community Development Plans
- Official Community Plans
- Neighbourhood Concept Plans
- Watershed Plans
- Regional Growth Strategies
- Sector Plans

¹*Species at risk* include species, sub-species or populations that are COSEWIC or provincially Red and Blue listed or considered regionally important.

²*Ecosystems at risk* include species communities that are provincially Red and Blue listed.

Jan 2007

1

¹ Source: South Coast Conservation Program (SCCP) Website: <http://www.sccp.ca/> (accessed June 24, 2008)

WORKING DRAFT

Step 1 – Identify Potential for Occurrences of Species and Ecosystems at Risk in Proposed Development or Work Areas

Proponents should assemble a comprehensive and updated list of all COSEWIC and provincially Red and Blue listed species and ecological communities (including vertebrates, plants, plant communities, fish and invertebrates) that potentially might occur within the study area. This information should be obtained from all possible sources, including:

- A search under the appropriate Forest District(s) and habitat types on the Ministry of Environment's "Species and Ecosystems Explorer" web page (www.env.gov.bc.ca/atrisk/toolintro.html).
- A request to the Conservation Data Centre (CDC) for rare element occurrence records (www.env.gov.bc.ca/atrisk/ims.htm).
- A review of all other appropriate species and ecosystems occurrence data sources (see list of data sources at South Coast Conservation Program web site – www.sccp.ca – on the *View Species and Habitat Data* page).
- Communication with Lower Mainland Ministry of Environment staff (Phone 604-582-5200).
- Communication with relevant local and regional governments, university researchers, First Nation organizations, local naturalists and local herbaria.

To facilitate monitoring of projects that might affect species and ecosystems at risk and to ensure that methods are considered credible, assessment results should be submitted to the Lower Mainland regional office of the Ministry of Environment (2nd Flr 10470 152nd Street, Surrey, V3R 0Y3; Phone 604-582-5200).

Sources for further information include, but are not limited to:

- COSEWIC, provincial and regional Status Reports, provincial Inventory Reports and provincial Identified Wildlife Management Strategy species accounts
- Provincial or federal Recovery Strategies and Action Plans
- Sensitive Ecosystems Inventory (SEI) information and Species Inventory Data System (SPI)

Step 2 – Conduct Appropriate Surveys to Inform on the Presence of Species and Ecosystems at Risk

Proponents should survey the study area for all COSEWIC and provincially Red and Blue listed species and ecological communities identified as potentially occurring in the region and the study area in particular. Note that permits may be required for some survey procedures as specified in the B.C. *Wildlife Act* (www.env.gov.bc.ca/pasb/index.html) and/or federal *Species at Risk Act* (www.sararegistry.gc.ca/agreements/permits_e.cfm).

WORKING DRAFT

- Sampling must be conducted in accordance with any detailed standards that have been recommended by the Ministry of Environment (see Appendix 1 for list of species).
- If detailed standards are not available, then Resources Inventory Standards Committee (RISC) approved sampling methodology must be followed (ilmbwww.gov.bc.ca/risc/standards.htm).
- To ensure that data are considered credible, sampling must be conducted by a qualified environmental professional.
- Surveys should be conducted at the appropriate time of year because for some species detection out of season may be impossible (e.g. Phantom Orchid).
- Survey methods should be adjusted where possible to avoid incidental mortality of non-target species (e.g., when minnow trapping in the range of the Pacific Water Shrew, consider this article - http://www.forrex.org/publications/streamline/ISS31/streamline_vol9_no2.pdf).

To facilitate monitoring of projects that might affect species and ecosystems at risk and to ensure that methods are considered credible, survey results should be submitted to the Lower Mainland regional office of the Ministry of Environment (2nd Flr 10470 152nd Street, Surrey, V3R 0Y3; Phone 604-582-5200).

General information on Species and Ecosystems at Risk: www.env.gov.bc.ca/wld/serisk.htm

Resources Inventory Standards Committee: ilmbwww.gov.bc.ca/risc/index.htm

Step 3 – Avoid or Mitigate Impacts to Species and Ecosystems at Risk (including Individuals, Residences and Important Habitats)

The BC Government has committed to protect species at risk and their habitat (Accord for the Protection of Species at Risk, 1996) and the federal *Species at Risk Act* mandates effective protection to listed species under provincial jurisdiction. Proponents should thus follow the below guidance for avoiding and mitigating harm to species and ecosystems at risk.

Provincial Best Management Practices guidelines have been produced that outline how development impacts can be mitigated for species and ecosystems at risk in both terrestrial and aquatic environments (see www.env.gov.bc.ca/wld/BMP/bmpintro.html and the *Guidelines* page at www.sccp.ca).

For some species, recovery team recommendations might be integrated into more specific Best Management Practices guidelines. The Species and Ecosystem Explorer (www.env.gov.bc.ca/atrisk/toolintro.html), South Coast Conservation Program web site (www.sccp.ca) and Lower Mainland Region Ministry of Environment staff (Phone 604-582-5200) should be consulted to inquire about the availability of such guidelines. For some species (e.g. Pacific Water Shrew – see www.sccp.ca), these documents will form the basis of advice on both survey standards and mitigation of development effects. The same sources also should be consulted to inquire about the availability of other information such as recovery strategies or action plans for particular species. In lieu of any information as described above, proponents

WORKING DRAFT

should consult with Lower Mainland Ministry of Environment staff on the best available methods for mitigation of impacts (Phone 604-582-5200).

To facilitate monitoring of projects that might affect species and ecosystems at risk and to ensure that methods are considered credible, mitigation strategies should be submitted to the Lower Mainland regional office of the Ministry of Environment (2nd Flr 10470 152nd Street, Surrey, V3R 0Y3; Phone 604-582-5200).

Appendix 1

Roles and Responsibilities of BC Government and Recovery Teams:

1. Recovery Teams provide Government and other interested parties with best available science in the form of Recovery Strategies, Action Plans or other information sources.
2. Recovery Teams advise Government on the biological feasibility of recovery through Recovery Strategies, and advise Government on the socio-economic costs of Action Plans and benefits to be derived from their implementation.
3. Recovery Team recommendations will inform management practices, consistent with and dependent on all other relevant legislation and the biological and socio-economic feasibility of recovery. Where appropriate, Government will set Recovery Team recommendations into Best Management Practices (BMPs).
4. Recovery Teams will review the effectiveness of recovery actions (which may include application of BMPs) on an ongoing basis, and of the implementation of Recovery Strategies every five years.
5. Government, in consultation with Recovery Teams, will monitor success or failure in recovery and application of the BMPs. The level of success will be reviewed every five years, unless otherwise specified by Government.

Species with Special Survey Standards Available:

- Great Blue Heron (kym.welsetad@gov.bc.ca or Phone 604-582-5200)
- Oregon Forestsnail (kym.welsetad@gov.bc.ca or Phone 604-582-5200)
- Oregon Spotted Frog (sylvia.letay@gov.bc.ca or Phone 604-582-5200)
- Pacific Water Shrew (kym.welsetad@gov.bc.ca or Phone 604-582-5200)
- Phantom Orchid (kym.welsetad@gov.bc.ca or Phone 604-582-5200)
- Streambank Lupine (sylvia.letay@gov.bc.ca or Phone 604-582-5200)
- Spotted Owl (myke.chutter@gov.bc.ca or Phone 250-387-9500)
- Tall Bugbane (kym.welsetad@gov.bc.ca or Phone 604-582-5200)

- General advice for plant surveys (see Plant Identification page at www.eflora.bc.ca; note specific advice for rare plants)
- General advice for bat surveys (laura.friis@gov.bc.ca or Phone 250-387-9500)