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FISH AND WILDLIFE  
COMPENSATION PROGRAM

# PUNTLIDGE RIVER WATERSHED

## *SPECIES OF INTEREST ACTION PLAN*

FINAL DRAFT

The FWCP is a partnership of:

**BC**hydro   
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Canada 



Fisheries and Oceans  
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# Puntledge River Species of Interest Action Plan

## 1 INTRODUCTION

The Fish and Wildlife Compensation Program (FWCP): Coastal Region evolved from its origin as the Bridge-Coastal Restoration Program (BCRP), a program initiated voluntarily by BC Hydro in 1999 to restore fish and wildlife resources that were adversely affected by the footprint of the development of hydroelectric facilities in the Bridge-Coastal generation area. Footprint impacts include historical effects on fish and wildlife that have occurred as a result of reservoir creation, watercourse diversions and the construction of dam structures.

In 2009, the program developed a strategic framework that guides overall planning for compensation investments (MacDonald, 2009). The framework has guided the development of strategic plans for each watershed within the FWCP program area, which are in turn informing action plans that focus on specific priorities within each watershed (Figure 1).

This Species of Interest Action Plan sets out priorities for the Fish and Wildlife Compensation Program to guide projects in the Puntledge River Watershed. As many species of interest, such as Roosevelt Elk may have ranges that extend beyond the watershed boundaries, the action plan may also consider actions in areas beyond the Puntledge watershed. Also, as the headwaters of the Puntledge River system are adjacent to the headwaters of the Ash River and Campbell River systems, some activities may be considered jointly between the three systems, such as inventory and mapping.

The plan focuses on species of conservation concern (including species-at-risk) or other regionally important species for management planning process. The plan builds on the FWCP's strategic objectives and the Puntledge River Watershed Plan (FWCP, 2011). Action plans have also been developed for riparian and wetland areas and salmonids; and some actions may be complementary across the different plans.

The actions and priorities outlined in this plan have been identified through a multi-stage process involving BC Hydro, Fisheries and Oceans Canada (DFO), Canadian Wildlife Service (CWS), Ministry of Environment (MOE), local First Nations, and local communities. Initial priorities were developed through consultation with agency staff. These priorities were then reviewed and discussed at a workshop<sup>1</sup> to allow First Nations, public stakeholders, and interested parties to comment and elaborate on the priorities. In addition to mapping and inventory of species of conservation concern, the priority species included in this plan are:

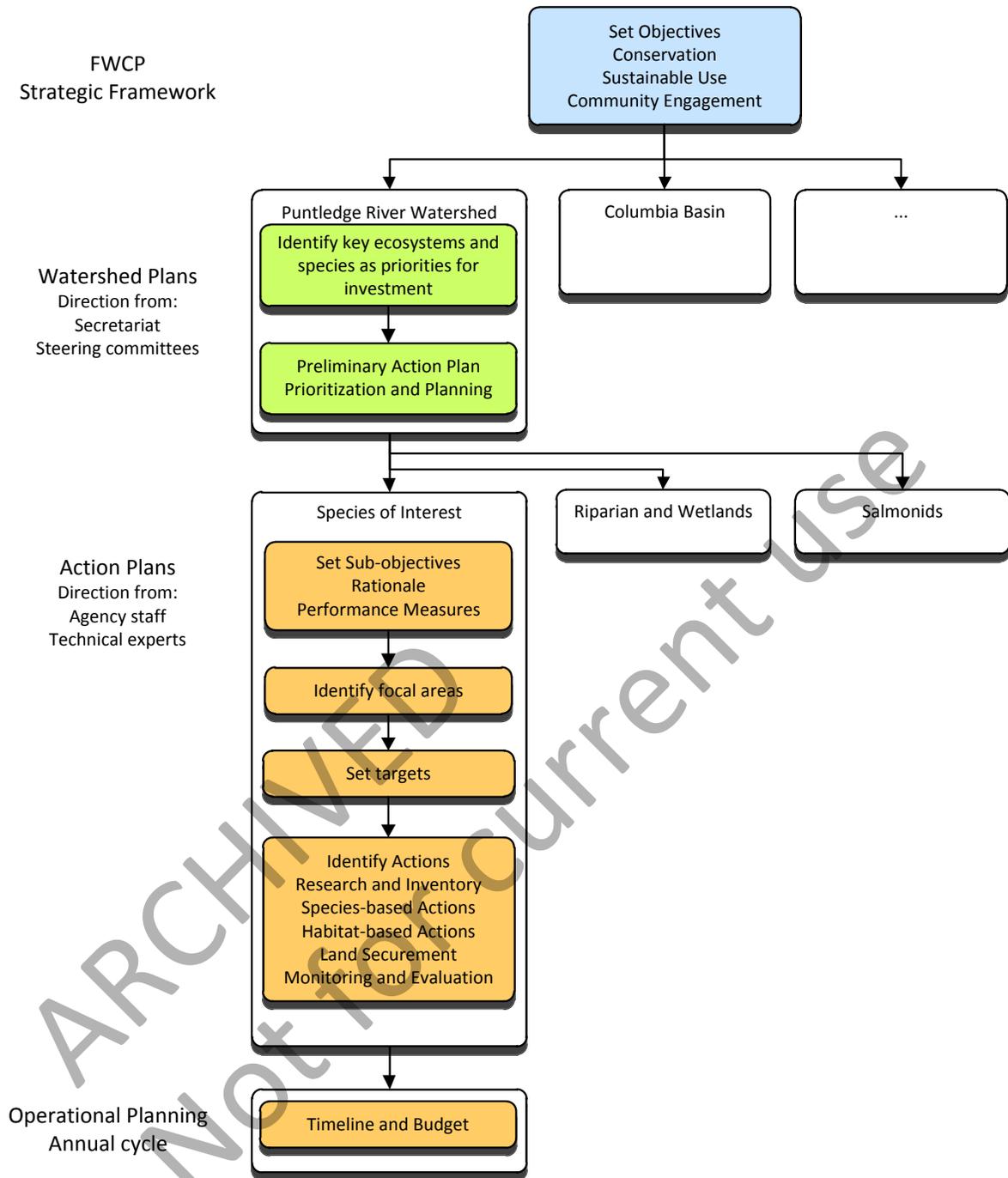
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<sup>1</sup> Courtenay, B.C. (14 March, 2008)

- Roosevelt Elk
- Vancouver Island Marmot
- Great Blue Heron
- Northern Pymy-owl
- Western screech-owl
- Band-tailed pigeon
- Northern red-legged frog

It is important to understand, however, that planning priorities within action plans may not translate immediately into funded projects. Limited program funding requires that priority-setting has to also be developed across the program as a whole, not just within action plans. The process of selecting which actions will be implemented in any given year will occur during the annual implementation planning cycle.

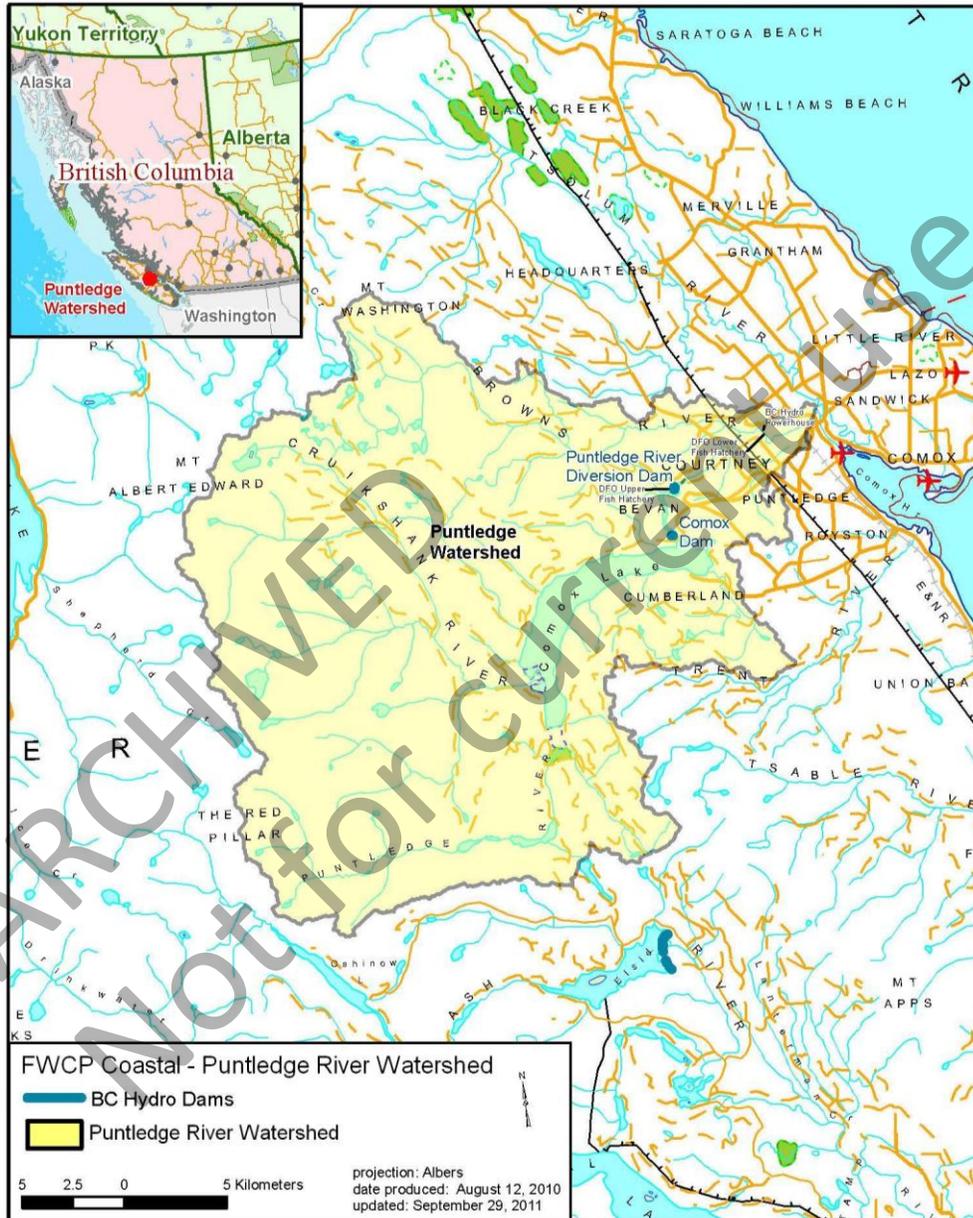
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**Figure 1: Relationship between the Species of Interest Action Plan and higher level planning and objectives.**

## 2 OVERVIEW CONTEXT

The Puntledge River basin lies on the eastern side of the Vancouver Island Mountain Range approximately midway along the length of the island (Figure 2). The basin is very rugged with mountain peaks rising to 2,134 m. It typically receives considerable snow pack and glaciers cover approximately 4 km<sup>2</sup> of the basin and are located above 1,310 m.



**Figure 2: The Puntledge hydropower project.**

The Puntledge River and the Cruikshank River feed Comox Lake from the SW, the latter contributing a mean annual inflow of 18 m<sup>3</sup>/sec of glacial melt. Most of the lake is surrounded by relatively steep terrain except for the northeast end where

the terrain is relatively low and flat. The Puntledge system experiences a 'spill-over' effect from systems moving off the Pacific and heavy rains occur from October through March. The hydrology is predominantly dominated by spring snow melt and fall and winter storms. The average precipitation in November is 300mm, but can be as high as 550mm.

The Puntledge hydroelectric facilities are in the asserted traditional use areas of the Comox First Nation, Sliammon First Nation, and Homalco First Nation. The main population centres are Courtney and Comox. The head waters of both the Puntledge and Cruikshank Rivers are in Strathcona Provincial Park.

Hydroelectric development includes a storage dam at the outlet of Comox Lake and a diversion dam downstream (Figure 2). Water is carried by an overland penstock to a powerhouse on the lower Puntledge River. The project was first developed in 1912. In 1953-56 the dams and powerhouse were redeveloped and Comox Lake storage was increased.

## 2.1 IMPACTS AND THREATS

Fish and Wildlife habitat and species have been significantly altered due to the construction of the dams, the development of hydro-power, and alterations in the hydraulic regimes of the systems. The following summary of the primary footprint impacts is derived from:

- Bridge-Coastal Restoration Program: Strategic Plan, Volume 2: Watershed Plans, Chapter 3: Puntledge River (December 2000);
- Puntledge River Water Use Plan Consultative Committee Report (December 2004); and
- Findings in the Community Workshop (Courtenay, B.C., March 14, 2008).

**Hydro-related Impacts** — The impacts that occurred are based on location in the watershed as follows:

### *Upstream of Comox Dam.*

1. The dam flooded mainstem and tributary channels near the lake outlet.
2. Increased storage in Comox Lake flooded riparian areas and lake tributaries, and operations continue to negatively impact these areas.
3. The dam had no fish passage facilities for 10 years, which likely affected Chinook, coho and steelhead populations above the outlet of Comox Lake. There continue to be uncertainties regarding fish passage at the Comox Dam.

### *Downstream of Comox Dam to the Diversion Dam.*

4. The headpond area flooded 90,000 m<sup>2</sup> of important spawning and rearing habitat for summer Chinook and summer steelhead in the headpond between Comox and Puntledge dams.
5. Entrainment of adults and out-migrating smolts into the diversion tunnel remains a key consideration for fish management decisions. Agencies closed the fishway to all anadromous passage upstream in 1965, until 1996 when steelhead were allowed access.

*Diversion reach downstream of the Diversion Dam.*

6. Water diversions and occasional spills alter habitat characteristics in this reach. The Puntledge Water Use Plan assessed the issues associated with operations, and operational procedures have been altered to offset some impacts.

*Mainstem Puntledge downstream of the Powerhouse.*

7. Reduced peak flows affect geomorphology of the lower river.

**Non-Hydro Impacts** — Other impacts on fish populations in the Puntledge River watershed include historic effects of logging, coal mining, flood protection, and urbanization, hatchery operations, and predation by seals.

## 2.2 LIMITING FACTORS

The limiting factors for species of interest are dependent upon the specific species of interest. Suitable and productive habitat is, in general, a key limiting factor for most species. Species are therefore greatly impacted by activities affecting habitat and its associated food supply.

The factors are summarized here.

**Loss of Habitat:** Loss of riparian and wetland habitats has occurred in flooded valley bottoms. Potential effects include availability of habitat for amphibians, water shrews and other small mammals and their predators, foraging and overwintering habitat for ungulates, and breeding habitat for some species of neo-tropical migrants.

**Habitat Alterations:** Altered flow regime has changed riparian and wetland habitats, either increasing the period or extent of inundation or drying. This leads to changes in the composition and structure of the ecological community, precipitating changes in the suitability of the habitat for wildlife. Potential effects on wildlife include changes to habitat quality and quantity for species, including a lack of seasonal nesting sites, a lack of snags and for cavity nesters, or potential structures for raptors, etc. Also, the lack of riparian vegetation in drawdown zones affects ungulates, furbearers, small mammals and several species of passerines including some neo-tropical migrants.

**Wildlife Migration:** Structures, reservoirs and diversions can create impediments to wildlife movement.

## 2.3 TRENDS AND KNOWLEDGE STATUS

### SPECIES

Table 1 shows a list of potential species of conservation concern which could occur in the Puntledge River watershed. It is based on species with CF<sup>2</sup> ratings of 1-2 for any goal known to occur in both the Comox Valley Regional District.<sup>3</sup>

Priority species for FWCP investment were based on the results of interviews and workshops with agency staff and stakeholders (see the *Puntledge Watershed Plan*) and were reconciled among the Campbell, Puntledge and Ash watersheds.

Note that while fish are reported in Table 1 they are addressed in the Puntledge River Salmonid Action Plan.

No species-based work on wildlife has been funded by FWCP in the Puntledge watershed. In the adjacent Campbell River system, FWCP has contributed to the protection and conservation of the Vancouver Island Marmot by supporting activities under the Provincial Recovery Plan. The marmot population appears to be improving. There is some knowledge related to elk and other ungulate use in the adjacent Campbell River system where activities such as prescribed burns have been conducted to improve winter range habitat and have had a positive effect.<sup>4</sup>

### KNOWLEDGE GAPS

A comprehensive inventory of the species present in the in the Puntledge River system does not exist. While the existence of some species is known, for instance Cruickshank River Roosevelt Elk population, there is limited knowledge regarding the population and distribution of species at risk or of conservation concern.

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<sup>2</sup> Conservation Framework (CF) Goals are 1- contribute to global efforts for species & ecosystem conservation;2- prevent species & ecosystems from becoming at risk;3- Maintain the diversity of native species & ecosystems. They are rated between 1-6, where 1 is high priority and 6 is low priority.

<sup>3</sup> The search was performed using the Provincial Conservation Data Base at <http://www.env.gov.bc.ca/atrisk/toolintro.html>

<sup>4</sup> Campbell River Watershed Update (BCRP), Campbell River 28 May, 2009.

**Table 1: Species of conservation concern that are likely to be present in the Puntledge River Watershed (This is based on species with a CF rating of 1 or 2 for Comox Valley Regional District). High priorities for FWCP investment are in bold.**

Animal	COSEWIC	CF List	FWCP Priority	Comments (from workshop)
<b>Mammals</b>				
<b>Roosevelt Elk</b>		3,2,3	High	Terrestrial. MOE's Region 1 Fish and Wildlife section identified that the populations and habitat for Roosevelt elk are their highest priority for most watersheds on Vancouver Island. Useful projects would include population study and habitat suitability modelling of the Cruickshank River Population; habitat restoration; land acquisition; and preserving riparian habitats.
Townsend's Big-eared Bat		5,2,3		Wetland; terrestrial
Wolverine	SC (May 2003)	3,2,3		
Wolverine, <i>vancouverensis</i> subspecies	SC (May 1989)	2,6,2		Terrestrial
<b>Vancouver Island Marmot</b>	E (Mar 2008)	1,6,1	High	Terrestrial. Puntledge River watershed is within the species' historical range. Work has been done in the Campbell River watershed to help expand marmots to their historical range.
Ermine, <i>anguinae</i> subspecies		2,2,3		Wetland; terrestrial
Keen's Myotis	DD (Nov 2003)	1,6,1		Wetland; terrestrial
American Water Shrew, <i>brooksi</i> subspecies		1,6,2		Lake; wetland; riparian
<b>Birds</b>				
Northern Goshawk, <i>laingi</i> subspecies	T (Nov 2000)	1,6,1		Terrestrial

Animal	COSEWIC	CF List	FWCP Priority	Comments (from workshop)
<b>Great Blue Heron, <i>fannini</i> subspecies</b>	SC (Mar 2008)	3,6,1	High	Estuarine; lake; wetland; riparian; terrestrial
Short-eared Owl	SC (Mar 2008)	6,2,3		Estuarine; wetland; terrestrial
Marbled Murrelet	T (Nov 2000)	1,1,2	Low	Estuarine; lake; marine; terrestrial
Common Nighthawk	T (Apr 2007)	6,2,4		
Northern Harrier	NAR (May 1993)	4,2,4		
Olive-sided Flycatcher	T (Nov 2007)	5,2,3		Wetland; terrestrial
Sooty Grouse		5,2,3	Low	Management interest is high but habitat restoration priority is low.
Peregrine Falcon	SC (Apr 2007)	5,2,3		
Peregrine Falcon, <i>pealei</i> subspecies	SC (Apr 2007)	2,1,2		Estuarine; lake; marine; riparian; terrestrial
<b>Northern Pygmy-Owl, <i>swarthy</i> subspecies</b>		1,3,3	High	Terrestrial
Bald Eagle	NAR (May 1984)	6,6,6		
Barn Swallow		6,2,3		Estuarine; lake; wetland; riparian; terrestrial
Caspian Tern	NAR (May 1999)	4,2,3		Estuarine; lake; marine; wetland; riparian; terrestrial
White-tailed Ptarmigan, <i>saxatilis</i> subspecies		2,4,4		Terrestrial
<b>Western Screech-Owl, <i>kennicottii</i> subspecies</b>	SC (May 2002)	3,1,2	High	Wetland; terrestrial
<b>Band-tailed Pigeon</b>	SC (Nov 2008)	5,2,3	High	Wetland; terrestrial
Double-crested Cormorant	NAR (May 1978)	6,2,3		Estuarine; lake; marine; wetland; riparian; terrestrial
Vesper Sparrow, <i>affinis</i> subspecies	E (Apr 2006)	4,6,1		Terrestrial
Purple Martin		6,6,3		Estuarine; lake; wetland; terrestrial
Barn Owl	T (Nov 2010)	6,2,3		Wetland; terrestrial

Animal	COSEWIC	CF List	FWCP Priority	Comments (from workshop)
<b>Amphibians, reptiles and turtles</b>				
Northwestern Salamander	NAR (May 1999)	5,1,3		
Western Toad	SC (Nov 2002)	3,2,4		
Western Painted Turtle - Pacific Coast Population	E (Apr 2006)	4,6,2		Lake; wetland; riparian
Common Ensatina	NAR (May 1999)	6,2,4		
<b>Northern Red-legged Frog</b>	SC (Nov 2004)	3,1,2	High	Wetland
<b>Fish</b>				
<b>Western Brook Lamprey</b> (Morrison Creek population)	E (Apr 2010)	1,6,1	High	Riverine. The only Species at Risk Act (SARA) listed species in the Puntledge Watershed is the Morrison Creek lamprey, which is a rare form of the Western Brook lamprey. SARA lists Morrison Creek lamprey as endangered. This unique species remains in freshwater for its entire life cycle. The main impacts on Morrison Creek lamprey appear to be related to land use encroachments and highway development; they are not related to BC Hydro footprint impacts. It is unlikely that BC Hydro related restoration activities (unless conducted within the Morrison Creek watershed) will affect this species. MoE wants to ensure that any restoration projects take potential impacts on this endangered species into account.
<b>Cutthroat Trout</b> , <i>clarkii</i> subspecies		4,2,3	High	Estuarine, riverine, lake, marine. MOE identified cutthroat trout as the second highest priority for Puntledge River (after steelhead).
<b>Coho Salmon</b>	E (May 2002)	4,2,4	High	
<b>Dolly Varden</b>		4,2,3	High	Estuarine, riverine, lake, marine

### 3 ACTION PLAN OBJECTIVES, MEASURES AND TARGETS

Clear and realistic management objectives are necessary to guide information acquisition and prioritize management actions. Priority actions and information needs will change as both improvements to the system are realized and information is gained. The current plan reflects the information available and values expressed by stakeholders (FWCP partners, First Nations and local communities) through reports, interviews and regional workshops held between 2009 and 2011.

#### 3.1 OBJECTIVE SETTING

The following terminology is used in this report.

Objectives:	Objectives are high-level statements of desired future conditions (outcomes), consistent with FWCP partner mandates and policies.
Sub-objectives and Status Indicators:	Sub-objectives are detailed statements of desired future conditions within objectives, from which status indicators can be derived and alternative management actions evaluated. Sub-objectives and indicators provide the details necessary to translate policy into actions and to evaluate their consequences. They may be arranged hierarchically within objectives, and usually indicate conditions necessary to attain the objective to which they refer.
Measures:	Measures are specific metrics whose values indicate the degree to which desired future conditions have been achieved. They can be either qualitative or quantitative. There is a preference to develop the latter where possible for ease of monitoring.
Targets:	Targets are the values of measurable items that indicate the attainment of a desired condition. In the current context these may be expressed as a single value or as a range to acknowledge the inherent variability of ecosystems.
Actions:	Management actions, plans or policies for achieving the objectives.

Objectives are the “ends” or the outcomes we ultimately care about. Actions are the “means,” or the things we do to achieve them. This report focuses on describing the actions required to achieve the objectives in relation to species of interest. Complementary actions may also be identified in the separate Salmonid and Riparian and Wetland Action Plans.

## 3.2 OBJECTIVES, MEASURES AND TARGETS

There are two management objectives for the Puntledge River system as a whole.

### **Objective 1: Maintain or improve the status of species of interest.**

**Rationale** — There is a high priority placed on improving the population and distribution of species of concern that are found within the Puntledge River system. Limiting factors for species of concern may be specific in nature, such as a lack of suitable nesting sites, or may be broader in scope. Consequently, action to improve the status of species may include improvements in the habitat and ecosystems they depend upon.

**Measure** — Measures may differ between species in term of success due to the nature of the species. For example marmots may be relatively easy to measure the absolute number and their distribution, while goshawks are more difficult and might require a different quantifier, such as ha of habitat suitable for breeding.

**Targets** — Specific targets will be developed for specific species focused projects.

### **Objective 2: Maintain or improve opportunities for sustainable use.**

**Rationale** — Several species of interest are the focus of sustainable use activities by First Nations and non-first nations people. For example some species are hunted (e.g., elk), while bird and wildlife viewing is also a popular recreational use in the watershed. Consequently, any actions aimed at achieving the above objectives indirectly support this sustainable use objective. Although there are no direct actions aimed at improving sustainable use at this time, it is conceivable that projects aimed at generally improving opportunities for sustainable use activities could be identified by the program partners in the future.

**Measures and Targets** — There are no specific measures or targets required at this time aside from those associated with the above objectives.

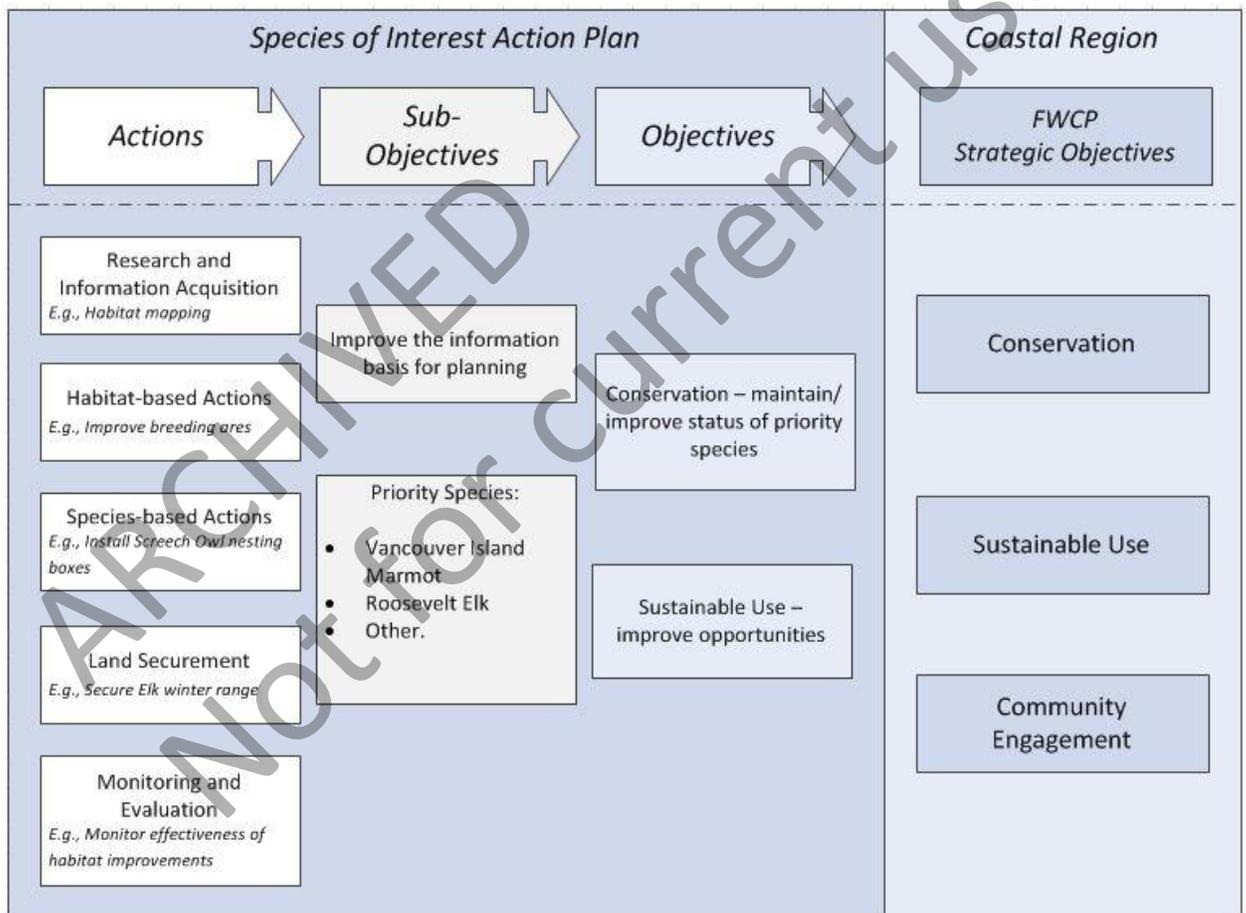
As part of their overall management responsibilities, MOE periodically collects information regarding abundance trends, hunter reports, catch per unit effort (CPUE) and number of hunting licences sold in the region.

## 4 ACTION PLANNING

### 4.1 OVERVIEW OF PLAN

Management for species of interest ultimately rests with the provincial and federal environment Ministries, but FWCP contributes resources towards planning and implementation of management actions that benefit species within its program area, usually based on the outcomes of multi-agency planning processes. FWCP's mandate limits its involvement in species of interest management to activities that meet FWCP objectives.

The Action Plan has several individual actions for each species, which are presented in Section 4.2. Some actions support multiple sub-objectives, which in turn support multiple objectives. Figure 3 provides an overview of the link between actions and objectives.



**Figure 3: Relationship between actions, sub-objectives and objectives in this Species of Interest Action Plan and the FWCP strategic objectives in the Puntledge River Watershed Plan.**

## 4.2 COMPONENTS

The FWCP is most interested in receiving proposals to address the high-priority species listed in Table 1:

- Roosevelt Elk
- Vancouver Island Marmot
- Great Blue Heron
- Northern Pymy-owl
- Western screech-owl
- Band-tailed pigeon
- Northern red-legged frog

Specific actions have been proposed in this watershed for Vancouver Island marmot. The species-focussed actions are aimed at mitigating key limiting factors. Where actions address habitat limitations they do so in relation to specific factors affecting a specific species. There may of course be additional benefits for other species which depend upon the habitat in question. Many species of concern are related to streams, wetlands and riparian areas. In implementing actions under the Species of Interest Plan close coordination should be maintained with actions under the Riparian and Wetlands Plan and the Salmonid Action Plan to ensure compatibility and to develop synergy.

Actions are organized under five broad categories: Research and Information Acquisition, Habitat-based Actions, Species-based Actions, Land Securement and Monitoring and Evaluation. Also provided are priority ratings to guide investment planning efforts.

### INVENTORY AND ACTION DEVELOPMENT

Tables of actions have yet to be developed for several high-priority species. For these, proposals that address inventory requirements as well as the development and implementation of management actions are encouraged.

### VANCOUVER ISLAND MARMOT

**Rationale** — The Vancouver Island marmots is critically endangered and listed in Schedule 1 of the federal *Species at Risk Act* ( COSEWIC-Endangered/ CF-1,6,1). It has a recovery strategy for management actions.

**Measure** — Measures for specific projects will be aligned with the recovery plan.

**Targets** — Targets for specific projects will be aligned with the recovery plan.

#	Action	Rationale	Priority
Research and information acquisition			
Species-based actions			
1	Support implementation of actions in the Vancouver Island Marmot recovery strategy.	A recovery strategy exists and should be supported.	1
Habitat-based actions			
Land Securement			
Evaluation and monitoring			

## 5 REFERENCES

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