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FISH AND WILDLIFE
COMPENSATION PROGRAM

CLOWHOM WATERSHED WATERSHED PLAN

FINAL DRAFT

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BC Hydro 
FOR GENERATIONS



Canada



Fisheries and Oceans
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Canada

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Clowhom River Watershed Plan

1 INTRODUCTION

This Clowhom River Watershed Plan sets forth the strategic direction for the Fish and Wildlife Compensation Program: Coastal Region.

It begins by briefly outlining the vision, principles, policy context and strategic objectives that form the foundation of the FWCP. A description of the Clowhom River setting includes an overview of the hydro-electric facilities and footprint impacts created by those facilities. The plan describes the development of strategic objectives for FCWP, the creation of priorities for the Clowhom watershed and outlines priority actions and projects for the system.

1.1 FISH AND WILDLIFE COMPENSATION PROGRAM

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 original 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 and projects that focus on specific priorities within each watershed (Figure 1).



Figure 1: Relationship between the FWCP Strategic Framework, policy, strategy and action.

Delivery of the program as a whole is guided by a vision, set of principles and policy priorities as developed by the program's partners.

VISION

Thriving fish and wildlife populations in watersheds that are functioning and sustainable.

An effective program will support the maintenance of healthy fish and wildlife populations in basins significantly altered by hydroelectric development. Actions taken should satisfy both the conservation and sustainable use objectives and, where possible, restore ecosystem function, making species more resistant to emerging pressures such as climate change.

PRINCIPLES

Approach - The program has a forward-looking, ecosystem-based approach that defines the desired outcomes and takes actions to restore, enhance and conserve priority species and their habitats.

Decision Making - The program efficiently uses its resources and works with its partners to make informed and consensus-built decisions that enable the delivery of effective, meaningful and measurable projects that are supported by the impacted communities.

Geographic Scope - Within the watersheds, basins and ranges of the populations of species affected by generation facilities owned and operated by BC Hydro.

Objectives - The program defines and delivers on compensation objectives that reflect the partnership's collective goals, and that align with local provincial and federal fish and wildlife conservation and management objectives in the areas where we work.

Delivery - The program strives to be a high performing organization with skilled and motivated staff and partners delivering efficient, effective and accountable projects.

PARTNERS

The program is a partnership between BC Hydro, the BC Ministry of Environment, Fisheries and Oceans Canada, First Nations and public stakeholders. Our goal is to have engagement and participation of all the partners in priority setting, approval, review and delivery of the program.

POLICY CONTEXT

The FWCP addresses the policy requirements and social commitments to compensate for impacts to fish and wildlife associated with the development of BCH's generating facilities. The core responsibilities of the agencies are:

Ministry of Environment

The Ministry of Environment manages and delivers a wide range of programs and services that support the Province's environmental and economic goals¹. The Ministry encourages environmental stewardship, develops innovative partnerships, engages First Nations, stakeholders and the public and actively promotes the sustainable use of British Columbia's environmental resources. Within this broader context, the Ministry has a number of responsibilities that are particularly relevant to the development and implementation of actions under the FWCP including:

- Management and conservation of the province's biodiversity;
- Protection of fish, wildlife, species-at-risk and their habitats;
- Protection and restoration of BC's watersheds; and,
- Provision and management of fish and wildlife-based recreation.

¹ <http://www.bcbudget.gov.bc.ca/2010/sp/pdf/ministry/env.pdf> (MOE Service Plan)

A number of policies and plans guide the Ministry in delivering on these goals and objectives. The **Conservation Framework**² is British Columbia's approach for maintaining the rich biodiversity of the province, providing a set of science-based tools and prioritized actions for conserving species and ecosystems in B.C. **Program Plans for Freshwater Fisheries, Wildlife and Ecosystems**³ articulate a clear set of strategies supported by actions to achieve both conservation-based outcomes and the provision of recreational opportunity. **Recovery Strategies and Management Plans** have been developed to guide the maintenance, recovery and/or use of specific species and ecosystems. These plans may include specific performance measures and targets.

Fisheries and Oceans Canada

Under the **Fisheries Act**, DFO is the primary agency responsible for conserving and managing Canada's fisheries, including Pacific salmon. It does so through management and monitoring of fisheries, protection of fish habitat, and pollution prevention. The **Policy for the Management of Fish Habitat** (1986) has an overall objective of 'net gain' of fish habitat and helps guide the implementation of fish habitat protection through collaboration with relevant provincial agencies. The **Species at Risk Act** mandates protection of geographically and genetically distinct populations. The principle goal of the **Wild Salmon Policy**⁴ and is "to restore and maintain healthy and diverse salmon populations and their habitats for the benefit and enjoyment of the people of Canada in perpetuity". This is achieved through safeguarding genetic diversity, maintaining ecosystem integrity and managing for sustainable fisheries.

BC Hydro

As a Crown Corporation, BC Hydro is committed to producing, acquiring and delivering electricity in an environmentally, socially and financially responsible manner,⁵ through managing impacts from its operations, and weighing environmental values with social and economic interests. Where negative impacts cannot be avoided, it will work to mitigate or offset them, enhance affected habitat and sustain resources over the long term. As part of its water licenses to operate its facilities, BC Hydro is required to undertake compensation programs in different regions of the province. Through the compensation program, it is committed to developing positive projects, such as investments to improve fish stocks, and building relationships to encourage stakeholder and aboriginal community engagement, particularly where their input can contribute to better decisions.

PROGRAM DELIVERY

The overall vision and common principles drive the FWCP program and projects, and provide a foundation for determining strategic priorities at the watershed level (Watershed Plans) which, for the smaller basins, are developed into actions and projects. The bulk of projects undertaken in small basins by the FWCP will be delivered under Watershed Plans that lay out a suite of key actions to achieve specific goals associated with species and ecosystems. Actions could include research, implementation activities, monitoring and evaluation activities, and communication mechanisms. Applicants are encouraged to use the Watershed Plans to develop projects that meet the overall objectives of the FWCP program. Technical Committees, staff and the management board will reference the plans to ensure that the highest priority projects are invested in.

A portion of the FWCP program activities will include small-scale, short-duration strategic projects that target specific issues identified by program partners or others (e.g., community members). These could include projects not yet identified in any Watershed Plan, as well as lower priority items that require timely response in order to take advantage of an investment or partnership opportunity.

² <http://www.env.gov.bc.ca/conservationframework/>

³ <http://www.env.gov.bc.ca/esd/>

⁴ Canada's Policy for Conservation of Wild Pacific Salmon, 2005.

⁵ BC Hydro Social Responsibility Policy.

PROJECT INVESTMENT CRITERIA

At the level of individual project investment and implementation decisions, the FWCP applies the following criteria to further define its role and actions within defined program areas:

- FWCP does:
 - Fund actions to create, restore, or otherwise improve the function of ecosystems that have been impacted by BC Hydro activities;
 - Fund actions to create, restore, or otherwise improve the function of alternate ecosystems that provide a better opportunity for investment;
 - Participate as a team member in species of interest planning;
 - Fund specific management actions for species of interest as identified by recovery teams and action/implementation groups;
 - Fund baseline inventory that contributes to the development of habitat or species based actions within Watershed Plans;
 - Fund monitoring programs designed to measure the effectiveness of FWCP funded habitat and species actions; and,
 - Contribute to all aspects of managing co-operatively managed conservation lands.
- FWCP does not:
 - Fund core activities of government or non-government agencies or programs;
 - Lead the development of species recovery goals;
 - Fund, co-ordinate or lead National Recovery Teams for species at risk;
 - Develop policy related to land or wildlife management;
 - Administer government regulations;
 - Engage in enforcement and compliance activities, except in relation to co-operatively managed conservation lands; and,
 - Fund programs designed exclusively to address government harvest objectives.

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2 CLOWHOM WATERSHED⁶

2.1 SETTING

The Clowhom watershed is on the Sunshine Coast and drains into the Salmon Inlet. It is approximately 32 km northeast of Sechart (Figure 2). The Clowhom Reservoir receives water from a 382 km² drainage basin that is subject to large, short-term fluctuations in inflows. The watershed includes the Clowhom River, as well as a number of smaller streams entering the sides of the river and the reservoir. The Clowhom Reservoir inundated two previously existing lakes. The basin ranges from sea level to 2400m and the vegetation varies from dense forest to alpine. While there are glaciers they do not constitute a significant portion of the drainage basin. The basin is influenced by Pacific Ocean air masses and cyclonic storms produce heavy and prolonged rainfall, principally from October to March. The average rainfall for November is 350 mm.

The Clowhom hydroelectric facilities consist of a concrete gravity dam with two gated spillways that reduces the spill discharge by surcharging the reservoir during times of high flows. Water is diverted through a penstock to the generating station which has a capacity of 33 MW. Water is discharged directly into the Salmon Inlet. The facility normally runs around the clock during the summer snowmelt and the autumn storm events. The remainder of the year it acts as a peaking plant to run during heavy demand periods.

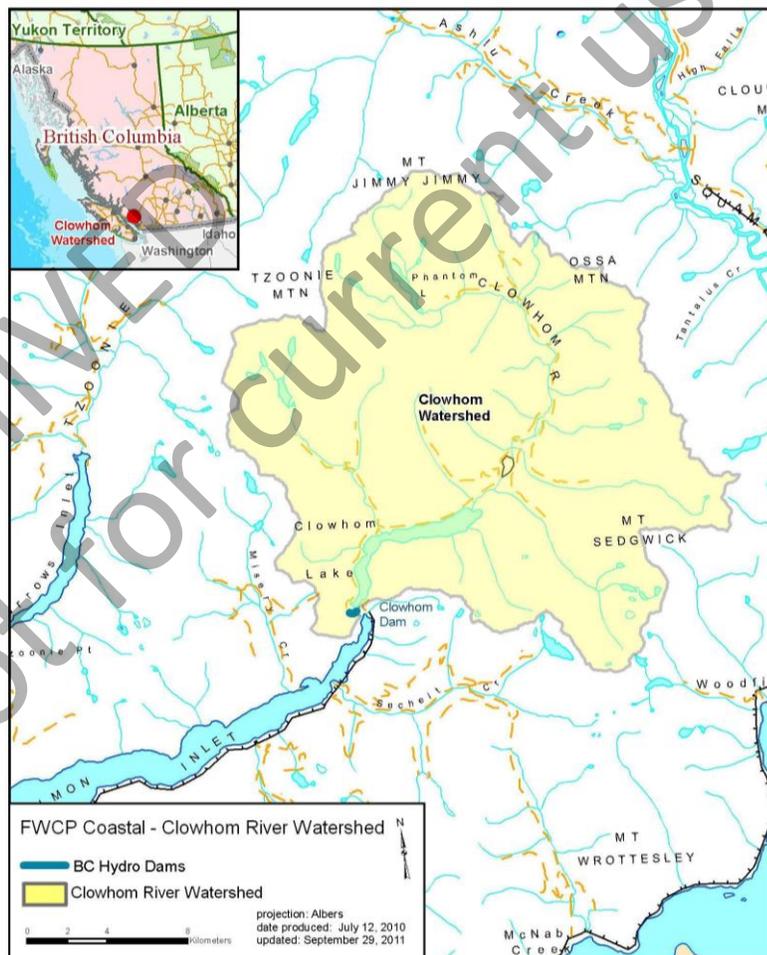


Figure 2: Clowhom Watershed

⁶ More details of the watershed can be found at: http://www.bchydro.com/bcrp/about/strategic_plan.html

The Clowhom watershed lies within the traditional territories of the Sechelt First Nation. The nearest community of size is Sechelt.

2.2 FOOTPRINT ISSUES

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: Clowhom River Plans, Chapter 14: Clowhom River (December 2000);
- Clowhom River Water Use Plan Consultative Committee Report (November 2003); and
- Findings in the Community Workshop in Sechelt (31 January 2011).

Inundation: The dam inundated two existing lakes and 315 ha of land.

Habitat loss: 41 ha of riparian habitat, 6km of mainstem and 3 km of lower tributary channels, and 430 ha of existing lake flooded, including 17 km of shoreline. Dam has eliminated large woody debris and gravel recruitment downstream.

Migration barriers: Construction of two dams has eliminated a narrow 200m long side channel around the falls that may have provided access for anadromous species. There are none present now. Drawdown may limit access to tributaries for rainbow trout. The flooding of the lakes represents a barrier to the movement of wildlife.

New Habitat: New lake habitat created; open water for osprey and waterfowl.

Altered Flow Regime: Altered flows may have localized effects on the salinity regime in marine foreshore. Drawdown may limit establishment of aquatic and riparian vegetation that has negative effects on ungulates, furbearers, and some small mammals.

Entrainment: Magnitude of entrainment is unknown.

2.3 FWCP ACCOMPLISHMENTS TO DATE

Since 1999 the Bridge Coastal Restoration Program has invested approximately \$5,000 to conduct the Spawning and Rearing Habitat Assessment in the Lower Clowhom River for salmonids, in particular steelhead and cutthroat. In general, however, there is poor in-stream habitat quality. The study⁷ indicated that no critical spawning or rearing habitat was found downstream of the dam and no opportunities for restoration were identified. Any restoration work would potentially be flushed out by extremely varied flow due to fluctuating operating regimes, and large spill events.

⁷ Sigma Engineering (2006) Spawning and Rearing Habitat Assessment in Lower Clowhom River, Bridge Coastal Restoration Program.

3 STRATEGIC OBJECTIVES FOR FWCP

Strategic objectives for the Fish and Wildlife Compensation Program reflect a synthesis of the core objectives and mandates of the partner agencies as they relate to mitigating impacts associated with hydro-power generation in British Columbia.

Conservation and sustainable use are core objectives for both the Ministry of Environment and Fisheries and Oceans. Conservation is addressed in terms of maintaining specific species or habitats both in terms of their importance for diversity (including genetic diversity), as well as their importance for ecosystem functions, integrity and productivity. For example, a species such as White Sturgeon may be important in terms of species diversity, while Pileated Woodpeckers may be important for maintaining ecosystem functioning and integrity by creating habitat for other species. Sustainable use incorporates the human interest in utilizing species for sustenance, commercial, recreational, or cultural purposes. Consequently, species such as coho, moose or bald eagles (wildlife viewing) could be considered important from a sustainable use perspective.

Community engagement is a core objective for BC Hydro under the compensation program and is driven by its social responsibility policy. It also reflects the 'shared stewardship' goal of the Ministry of Environment. It reflects the importance of incorporating local values and interests in determining and implementing projects.

The FWCP strategic objectives are therefore:

Conservation

- **Maintain or improve the status of species or ecosystems of concern.**
This focuses on the conservation goals for ecosystems, habitats or ecological communities, and specific species. Priorities may be identified through the provincial Conservation Framework, or at the Conservation Unit level under the federal Wild Salmon Policy. Conservation priorities may also be identified at the watershed level based on local conditions.
- **Maintain or improve the integrity and productivity of ecosystems and habitats.**
This addresses the concept of ecosystem integrity, resiliency and the functional elements of ecosystems, including efforts to optimize productive capacity.

Sustainable Use

- **Maintain or improve opportunities for sustainable use, including harvesting and other uses.**
This objective focuses on the program's role in restoring or enhancing the abundance of priority species and in providing information to resource management decision makers related to providing opportunities for harvesting and other uses. Harvesting includes First Nations, recreational, sport and commercial harvests. Other uses may include cultural, medicinal, or non-consumptive uses.

Community Engagement

- **Build and maintain relationships with stakeholders and aboriginal communities.**
This objective stems from BC Hydro's social responsibility policy and MOE's shared stewardship objective. This recognizes the importance of engaging aboriginal communities, local stakeholders, and other interest groups to contribute toward making good decisions and delivering effective projects.

4 PRIORITIES

4.1 INTRODUCTION

Across the FWCP as a whole, the general process of identifying priority action plans and projects involves three steps:

Step 1 – Identification (Candidate Priority Species and Ecosystems)

The first step involves identifying and prioritizing the species and ecosystems against the core strategic objectives, and how they have been impacted by footprint issues associated with hydro-power generation.

Step 2 – Preliminary Planning

This step consists of reviewing the identified priorities with consideration to identifying candidate action plans and projects. It may involve grouping species or ecosystems together for coordinated action. Key considerations include: addressing limiting factors, exploring the opportunity for multiple benefits, addressing any specific local threats, the practicality of implementing actions, and the plan's consistency with existing agency programs.

Step 3 - Prioritization

This step consists of a final prioritization of candidate action plans and projects (and their priority areas) according to cost effectiveness and technical feasibility criteria:

- **Technical Feasibility.** – The program should generally seek out investments that are the most technically feasibility. Considerations generally include the use of proven methods and availability of technical resources. Innovative approaches should be considered but they must have a credible technical foundation and reasonable expectation of success. The potential interrelationship with system operations and programs being implemented by the Water License Requirements program must also be considered.
- **Cost Effectiveness.** – The program should generally seek out investments that are the most cost effective. This includes issues or actions which may benefit multiple species, areas where there is an opportunity to leverage additional funds for activities, issues where previous work has been conducted and incremental expenditure may have substantive benefits, actions that are closely related to on the ground actions with measurable impacts, amongst others.

4.2 PRIORITY SETTING IN THE COASTAL REGION

In the Coastal region of the FWCP, Step 1 involved a review of existing Watershed Restoration Plans, interviews with agency staff, a series of community workshops and a final evaluation.

In 2000, specific restoration objectives were originally articulated in the Watershed Restoration Plans.⁸ These plans contain details of the major footprint impacts, objectives and limiting factors for productivity and have guided the work of the FWCP Coastal for the past decade.

In the case of the Clowhom watershed, priorities for FWCP Coastal were further reviewed and updated in 2010 and 2011 through consultation with BC Hydro, Fisheries and Oceans Canada (DFO), and Ministry of Environment (MOE). This resulted in a list of priority tables for fish and wildlife species in the Clowhom River watershed (Appendix A). Draft project priorities were reviewed with local First Nations and community groups at a workshop in Sechelt (31 January 2011).

⁸ Watershed Restoration Plans may be obtained at the FWCP website:
http://www.bchydro.com/bcrp/about/strategic_plan.html

4.3 PRIORITY TOPICS

The following topics have been identified as priority candidates for development into future FWCP Coastal project proposals. It is important to understand, however, that planning priorities 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. The process of selecting which projects will be implemented in any given year will occur during the annual implementation planning cycle.

1 – ASSESSMENT OF RESTORATION OPPORTUNITIES IN CLOWHOM LAKE (RESERVOIR) AND TRIBUTARIES

Rationale

Clowhom Lake (Reservoir) has rainbow, cutthroat, kokanee, sticklebacks, sculpins and fresh water lamprey. Some studies were conducted on reservoir productivity and spawning in 2002. In Bear Creek, Taquat Creek and Clowhom River, spawning habitat at the tributary mouths has been damaged due to siltation and erosion from the reservoir. Fish assessments and some surveys have been completed over the past five years as part of the Clowhom Water License Requirements (WLR) Program. The results of these studies should be reviewed and an assessment made on the potential opportunities to enhance habitat for lake and tributary species. It is also not confirmed if Clowhom Lake was historically accessible to anadromous salmonids. Core sampling of sediments would help determine the historical presence of sockeye which might help establish a basis for looking at fish passage.

Focus

- Review of the data collected from the Water Use Planning (WUP) process, and publicly available data from Independent Power Projects (IPPs), and/or forestry companies operating in the area
- Core sediment sampling to determine the historic fish use of Clowhom Lake.
- If appropriate assess possibilities of fish passage at Clowhom dam.
- Assess kokanee abundance and general pelagic fish population status of Clowhom Lake.
- Assess channel habitat and provide opportunities for restoration
- Field assessment of opportunities for multispecies habitat restoration activities (may include both fish and wildlife).
- Prioritization of activities.

Expected outcome

- Improve understanding of historical fish use of Clowhom Lake through lake sediment core analysis.
- Improve understanding of extent of fish population, including Kokanee, in the reservoir
- Channel improvement areas and potential projects identified.
- Full review of all of the work completed to date on the Clowhom reservoir and a report on priority areas for FWCP investment in the area above the dam

2 – ASSESSMENT OF DOWNSTREAM FISH RESTORATION OPPORTUNITIES

Rationale

There appears to be little opportunity for restoration work in the lower reaches of the Clowhom⁹. Nevertheless, there is merit in conducting an assessment based on any new changes that have occurred to the system as a result of the Water Use Plan. This project received strong support from the Sechelt workshop (31 January 2011).

Focus

- Analysis of work to date.
- Field assessment of opportunities for fish and wildlife restoration activities.
- Prioritization of activities.

Expected outcome

- Confirmation of extent of opportunities for FWCP investment in the area below the dam.

3 – RIPARIAN AND WETLANDS

3.1 – RIPARIAN AND WETLANDS MAPPING AND RESTORATION

Rationale

Riparian and wetland areas have been heavily impacted by the creation of dams, and continue to be under threat in many remaining areas. These areas are the limiting factor for critical life stages of many species, both aquatic and terrestrial. Riparian and wetland areas are both diverse and biologically rich and thus considered as highly valuable from an overall ecological standpoint.

To date, FWCP has not significantly funded restoration of riparian areas or wetlands in the Clowhom system. Currently, it is a priority to assess opportunities and implement restoration actions in areas with high restoration potential.

Through the FWCP priority-setting process, several general species groups (amphibians in particular) were considered first-priority representatives of the wetland and riparian community in terms of where to focus investment. Because there is little up-to-date information for these particular species in the watershed, the most immediate focus is to complete mapping and/or inventory that informs next steps (restoration, management, etc). Habitat mapping would help screen for habitats that might support species at risk, including owls, water shrew, amphibians and certain birds. Follow-up inventories of specific species would be better directed with a habitat mapping base as a foundation.

Focus

- Conduct habitat mapping of potential areas for restoration, particularly in the lower reaches of Clowhom Lake where opportunities have been noted. Determine possible habitats for amphibians, include mapping of old large riparian trees and old growth that could be used by cavity nesters.

Expected outcome

- Prioritized areas to conduct field work for species identification and for conservation and restoration.

⁹ Watershed Report Clowhom, 2000.

- Restoration opportunities identified and assessed.

3.2 – INVENTORY OF AMPHIBIANS

Rationale

Amphibians have been heavily impacted by the construction and operation of hydro power facilities, and are in decline in general. There are several species of concern with could inhabit the Clowhom watershed, including those in table 1.

Table 1: Potential Amphibians, Reptiles and Turtles in the Clowhom watershed.

Amphibian, reptile, turtle	COSEWIC	CF Rating
Northwestern Salamander		5,1,3
Western Redback Salamander		5,3,4
Western Toad	SC (Nov 2002)	3,2,4
Pacific Tailed Frog ¹⁰	SC (May 2000)	4,1,2
Red legged Frog	SC (Nov 2004)	3,1,2
Common Ensatina		6,2,4
Northern Alligator Lizard		5,3,4
Northwestern Garter Snake		5,3,4
Western Painted Turtle	E/SC (Apr 2006)	6,2,3
Western Painted Turtle - Pacific Coast Population	E (Apr 2006)	4,6,2

Focus

- Conduct field inventory for red-legged frog, and western toad and painted turtle. The pacific tailed frog inhabits fast cascading streams and would require a different inventory.

Expected outcome

- Confirmation of species presence/non-presence and prioritized areas to conduct work.
- Recommendation for restoration opportunities

¹⁰ Also referred to as Coastal Tailed Frog

4 – UNGULATE MONITORING

Rationale

Roosevelt elk have been introduced and are doing relatively well; however, human access may be limiting their productivity. Black-tailed deer appear to be declining (possibly from habitat loss). Both species are important from a sustainable use point of view.

Focus

- Monitoring of elk and deer populations and critical habitat (particularly winter range)
- Recommending opportunities for restoration or management

Expected outcome

- Trends in population and distribution, and limiting factors.
- Action recommendations for restoration or management.

5 REFERENCES

BC Hydro. 2004. Consultative Committee Report and draft Clowhom River Water Use Plan submitted to the Comptroller of Water Rights in November 2003. Summary available at: http://www.llbc.leg.bc.ca/public/pubdocs/bcdocs/367452/clowhom_xsumm.pdf

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APPENDIX A – PRIORITY TABLES

The following are the priority tables developed through consultation with the Ministry of Environment and the Department of Fisheries and Oceans in the summer and autumn of 2010. The tables represent the agencies' priorities for different species and what activities should be undertaken for them.

1- Fish

Species	Priority	Comments
Clowhom Lake and Tributaries		
All species	Medium	No Targets provided
	Medium	Conduct baseline assessments for Clowhom Lake and tributaries including sediment coring, kokanee stock assessment, habitat and water quality.
	Medium	Assess restoration opportunities/feasibility in the lower reaches of Upper Clowhom River.
Lower Clowhom River		
All species	Medium	No Targets provided
	High	Undertake assessments of fish use d/s of the dam. Assess opportunities for restoration/enhancement once the sediment sampling has been completed.
All species	low	No priority opportunities identified

2- WILDLIFE

MAMMALS

Species	FWCP Priority	CF Rank	Comments
Bats	Medium	1,6,1	Inventory is needed. There is concern about the spread of disease (white-nose). Keen's Myotis is red listed, CF= 1, 6, 1 (they found one near Sechelt; need geological mapping to identify whether hibernacula habitat is present).
Grizzly Bear ¹¹	Medium	3,2,3	Squamish-Lillooet GBPU (threatened). The population has very high conservation significance, high need for recovery, is important to adjacent populations and a very high priority for population trend monitoring (Apps 2010). Grizzly Bears have a high overlap with elk habitat measures. Habitat identification and protection measures needed. There is a need for habitat identification to determine the best restoration actions. There also needs to be a healthy food supply in the area to provide food for grizzly bears (Including elk, salmon and berries).
Wolverine	Low	3,2,3	There are limited restoration opportunities in the Clowhom.

¹¹ This is a recovery species for MOE in the Clowhom

Species	FWCP Priority	CF Rank	Comments
			Increase deer and elk population will help.
Marten and fisher	Low	6,2,4 4,6,2	Identified by First Nations and public
Cougar	Low	4,6,5	Identified by First Nations and public
Coyote	Low	6,6,6	Identified by First Nations and public
Roosevelt Elk ¹⁰	High	3,2,3	Recently reintroduced to the drainage, they are doing well, with limitations. The amount of traffic (human access) in the drainage is a problem. Restoration of elk population a high priority. Habitat enhancement and conservation necessary. Critical Habitat Capability/Suitability Mapping is required. Annual population monitoring/inventory using tracking is recommended.
Black-tailed deer	High	6,6,6	Identification of critical habitats (winter range), protection and enhancement measures needed. Population is declining (from habitat loss due to logging?). Critical Habitat Capability/ Suitability Mapping is required.
Mountain Goats	Low	4,1,3	They are present in the area. Local population has declined due to increasing access to Mountain Goat terrain from development. Further IPP development would likely put greater strain on the populations due to increased access.

BIRDS

BCR=Bird Conservation Region (CWS)
 PCJV=Pacific Coast Joint Venture (CWS)
 NAWMP=North American Waterfowl Management Plan (CWS)
 PIF=Partners in Flight (CWS)

Species	FWCP Priority	CF Rank	Comments
Pacific Sideband snail	Low	4,2,3	Identified by First Nations and public. Species has been found in adjacent watersheds, and during work on transmission line 1L44.
Amphibians (pacific tailed frog, red-legged frog, western toad)	High	1	Need generalized surveys for amphibians and turtles, can be done together quickly and efficiently.
Painted Turtles (Pacific population)	High	4,6,2	There is a population on the Sunshine Coast. However data is needed to determine if it is in the Clowhom and what restoration opportunities are available. The turtle population in Clowhom Lake seems to have crashed after the reservoir level was increase by five feet in 1952.
Great Blue Heron (<i>fannini</i> ssp.)	Medium	3,6,1	Species impacted by loss of nesting and foraging habitats due to hydroelectric development. Loss of habitat and predation by Bald Eagles are high magnitude threats. Projects: identification of nesting sites and conservation measures. Medium to high priority. A priority species in BCR 5.

Species	FWCP Priority	CF Rank	Comments
Northern Goshawk (<i>laingi</i> ssp)	Medium	1,6,1	A priority landbird species in BCR 5 for CWS. There are opportunities for goshawk conservation measures. A nest inventory is needed and then WHA designations. Deer winter range protection will help goshawk habitat needs.
Western Screech-owl (<i>kennicottii</i> ssp.)	Medium	3,1,2	Inventory is needed. If they are found to be present, riparian habitat conservation/restoration. A priority species in BCR 5.
Western Grebe (non-breeding)	Low	6,6,1	A priority species in BCR 5.
Double-crested Cormorant	Low	6,2,3	They are found close to Clowhom. MOE would be interested in any nesting records for the area. They may be declining and information is needed. A priority species in BCR 5.
Tundra Swan	Low	6,6,4	No trend (NAWMP). A priority species in BCR 5.
Trumpeter Swan	Low	5,6,5	Present in drainage. Believed to be increasing (NAWMP). A priority species for PCJV in BCR 5.
Harlequin Duck	Low	4,1,3	Population data: no trend (NAWMP). A priority species for PCJV and BCR 5 (CWS). A species that is definitely impacted by hydroelectric development.
Surf Scoter (non-breeding)	Low	6,4,4	Believed to be declining (NAWMP). A priority species for PCJV in BCR 5.
Bald Eagle	Low	6,6,6	A priority landbird species in BCR 5 for CWS. A priority bird for First Nations.
Peregrine Falcon (prob. <i>anatum</i> ssp.)	Medium	5,6,2	A priority landbird species in BCR 5 for CWS. Breeding records from not far away, MOE would be interested in any breeding records and very interested in getting DNA samples from peregrines in this area.
Gyrfalcon (non-breeding)	Low	6,6,4	Population trend: low vulnerability (PIF). A priority species in BCR 5.
Band-tailed pigeon	Medium	5,2,3	Need inventory and identification and protection of mineral licks. A priority species in BCR 5.
Marbled Murrelet	Low	1,1,2	There are populations on the Sunshine Coast. A portion of the Clowhom watershed forests burned 150-200 years ago so there is not great nesting habitat. A priority species in BCR 5.
Dusky (Blue) Grouse	Low	4,2,4	Identified by First Nations and public as a species with sustainable use values
Ruffed Grouse	Low	4,2,4	Identified by First Nations and public as a species with sustainable use values
Osprey	Low	6,6,6	Identified by First Nations and public

AMPHIBIANS, REPTILES AND TURTLES

Species	FWCP Priority	CF Rank	Comments
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Species	FWCP Priority	CF Rank	Comments
Pacific Sideband snail	Low	4,2,3	Identified by First Nations and public. Species has been found in adjacent watersheds, and during work on transmission line 1L44.
Amphibians (pacific tailed frog, red-legged frog, western toad)	High	1	Need generalized surveys for amphibians and turtles, can be done together quickly and efficiently.
Painted Turtles (Pacific population)	High	4,6,2	There is a population on the Sunshine Coast. However data is needed to determine if it is in the Clowhom and what restoration opportunities are available. The turtle population in Clowhom Lake seems to have crashed after the reservoir level was increase by five feet in 1952.