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FISH AND WILDLIFE
COMPENSATION PROGRAM

COQUITLAM/BUNTZEN WATERSHED

WATERSHED PLAN

FINAL DRAFT

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Table of Contents

1	Introduction.....	2
1.1	Fish and Wildlife Compensation Program	2
	Vision.....	3
	Principles	3
	Partners	3
	Policy Context.....	3
	Program Delivery.....	4
	Project Investment Criteria	5
2	Coquitlam Watershed.....	6
2.1	Setting.....	6
2.2	Footprint issues	7
2.3	FWCP Accomplishments to date	8
3	Strategic Objectives for FWCP	9
4	Priorities.....	10
4.1	Introduction	10
4.2	Priority setting in the Coastal Region	10
4.3	Priority Action plan summaries.....	12
	Salmonid Action Plan	12
	Species of interest Action Plan.....	13
	Riparian and Wetlands Action Plan.....	13
5	References	15
	APPENDIX A	16
	Habitats	16
	fish	16
	mammals.....	18
	Birds	19
	Amphibians, Reptiles and turtles.....	20

Table of Figures and Tables

Figure 1:	Relationship between the FWCP Strategic Framework, basin strategic plans and action plans. .	2
Figure 2:	Coquitlam River hydropower project.	7

Coquitlam River Watershed Plan

1 INTRODUCTION

This Coquitlam 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 Coquitlam setting includes an overview of the hydro-electric facilities and footprint impacts created by those facilities.

The priority setting process is described, followed by a short direction-setting synopsis of a set of priority Action Plans. Taken together, this Watershed Plan and the accompanying Action Plans present the FWCP: Coastal priorities for investments in compensation activities within the Coquitlam Watershed.

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

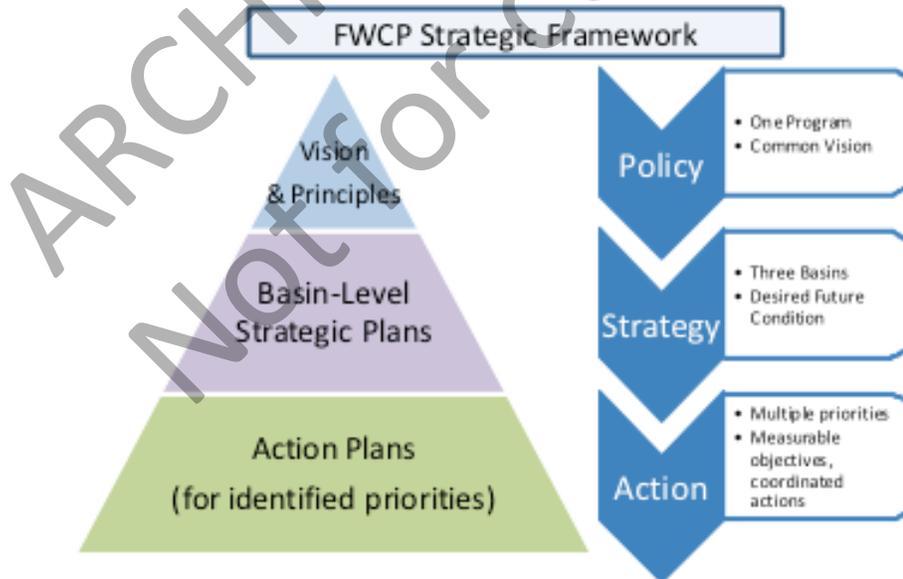


Figure 1: Relationship between the FWCP Strategic Framework, basin strategic plans and action plans.

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;

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

- Protection and restoration of BC's watersheds; and,
- Provision and management of fish and wildlife-based recreation.

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 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 are developed into Action Plans. The bulk of projects undertaken by the FWCP will be delivered under Action 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 and Action 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 action plans, as well as lower priority Action

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.

Plan items that require timely response in order to take advantage of a investment or partnership opportunity.

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 Action 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.

2 COQUITLAM WATERSHED⁶

2.1 SETTING

The Coquitlam River and Buntzen Lake watersheds lie in the southernmost extension of the Pacific Ranges of the Coast Mountains of British Columbia about 30 km northeast of Vancouver (Figure 2). The Coquitlam watershed area is 253 km² (193 km² above the dam and 60 km² below), with elevations ranging from 153 m to over 2000 m. The Buntzen Lake watershed has an area of 21 km², with elevations of 127 m to 1257 m. The Coquitlam basin is open to south-westerly flows of warm, moist air, which bring heavy rainfall. Approximately 50% of annual precipitation normally falls between October and January. Average precipitation in November is 560 mm; however, it can reach levels of 1000 mm or more.

The Coquitlam-Buntzen generating complex includes two dams, a diversion tunnel, two outlet tunnels, and two power houses (Figure 2). Coquitlam Dam is at the south end of Coquitlam Lake Reservoir. The dam provide the means for most water storage in the system and controls releases into the lower Coquitlam River. Water from Coquitlam Lake Reservoir is diverted through a tunnel into Buntzen Lake. Water from Buntzen Lake Reservoir flows via two release facilities, one at Buntzen Dam and another on the westernmost shore of the reservoir, to two powerhouses on the shore of Indian Arm. Metro Vancouver operates a separate diversion tunnel from Coquitlam Reservoir for drinking water, with a maximum flow of 13.7 m³/s.

The Coquitlam-Buntzen system is in the asserted traditional use area of five First Nations, including Kwikwetlem First Nation, Tsleil-Waututh First Nation, Katzie First Nation, Squamish First Nation and Musqueam First Nation. It is also within the asserted traditional territory of the Sto:lo Nation. Downstream of the Coquitlam Dam the Coquitlam River flows through the municipalities of Coquitlam and Port Coquitlam. The Upper Coquitlam watershed is within the area addressed by Metro Vancouver's Drinking Water Management Strategy. Buntzen Lake is surrounded by both Indian Arm Provincial Park and Buntzen Lake Regional Park.

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⁶ More details of the watershed can be found at: <http://www.bchydro.com/bcrp/projects/watersheds.html>

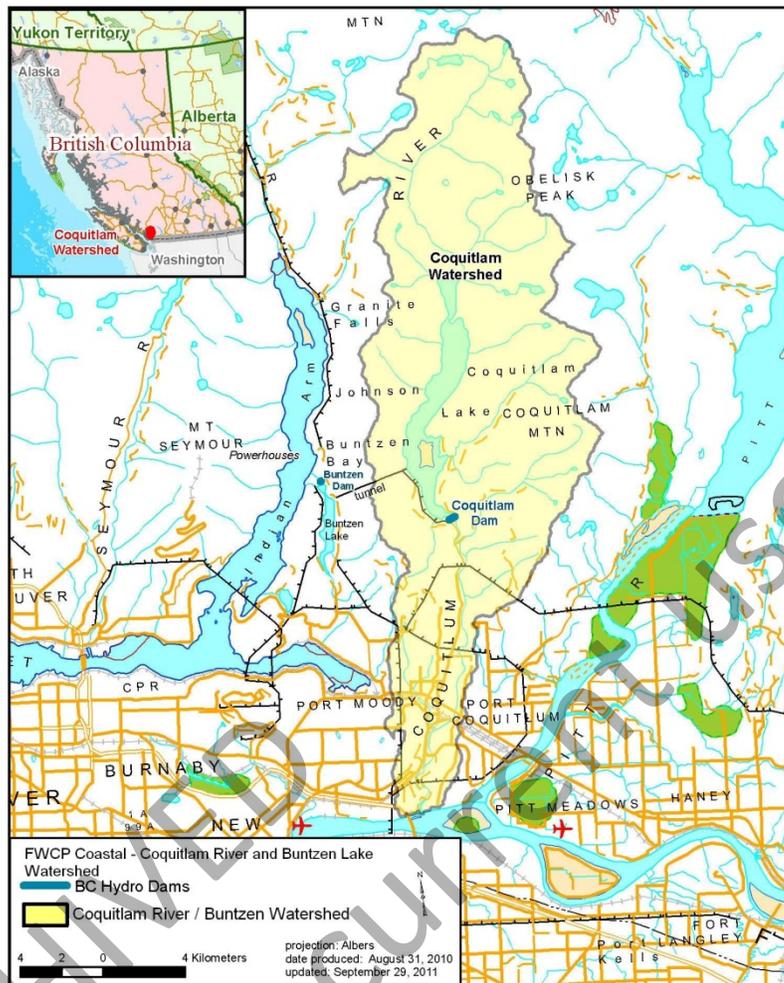


Figure 2: Coquitlam River hydropower project.

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: Watershed Plans, Chapter 8: Coquitlam River (December 2000);
- Coquitlam River Water Use Plan Consultative Committee Report (August 2003); and
- Findings in the Community Workshop (Coquitlam, 17 February, 2009).

Inundation: The combined reservoir area is 1,380 hectares, after flooding 225 hectares of land. The combined shoreline length is now 46 kilometres.

Habitat loss: Dam footprints have caused the loss of instream, riparian and upland habitats and the potential loss of lake outlet spawning habitat. Flooding of 17 hectares of river and lowland forest, the 30 kilometre perimeter of Coquitlam Lake, and 177 kilometres of upland forest has caused the loss of riverine and coniferous valley side habitats and associated wildlife losses (e.g., ungulates and carnivores have lost valley side habitat). Inundation caused a further 1.3 kilometres of mainstem and 6 kilometres of tributary channels loss.

Coquitlam dam also has blocked the flow of woody debris recruitment downstream. Flow reductions and urban encroachment have reduced the floodplain complexity of the downstream channels affecting both fish and wildlife. The lack of riparian vegetation in drawdown zones has affected ungulates, furbearers, small mammals and several species of passerines including some neotropical migrants. The lack of available habitat has affected amphibians, water shrews and other small mammals and their predators, browse for ungulates and breeding habitat for some species of neotropical migrants.

Migration barriers: Coquitlam Dam blocked passage of anadromous stocks. The tailrace discharges of the powerhouses into Indian Arm attract Chinook salmon. The number of fish affected and the impacts of the delay on reproductive success are unknown. There is reduced fish access between the reservoir and tributary habitats due to large drawdown regimes. Structures, reservoirs and diversions impede wildlife movement (especially for large mammals).

New Habitat: The reservoir has created new habitat for lake species, and spawning channels have been constructed below the dam.

Altered Flow Regime. Coquitlam Lake has been affected long-term by large reservoir drawdown regimes and the loss of historic salmon carcasses. The altered flow regime has changed riverine and riparian habitats. Potential effects on wildlife include changes to habitat quality and quantity for tailed frogs, water shrews, harlequins and dippers.

Diversions. The diversion has reduced flows to the downstream Coquitlam channel and increased flows into Buntzen Lake. These altered flows have affected the wetted channel area, seasonal temperatures, sediment flushing, and aquatic productivity. Diversion reduces Coquitlam reservoir's productivity. 70% of the Coquitlam drainage area is diverted and the residual mainstem flows have been reduced for 90 years. Low flows do not flush multiple sediment inputs and constrain spawning habitats.

Entrainment. Diversion caused entrainment mortality and injury of unknown magnitude.

Salinity: Discharge at the powerhouses has caused footprint and salinity impacts on the marine foreshore.

2.3 FWCP ACCOMPLISHMENTS TO DATE

Since 1999 the Bridge Coastal Restoration Program has invested approximately \$ 1.6 million in the Coquitlam watershed.

Restoration work includes:

- Colony Farm off-channel and wetland habitats.
- River Springs, Overlander, and Oxbow side-channel/pond complexes.

Research work includes:

- Coquitlam Reservoir ecology, limnology, fish population, spawning habitat, and Kokanee DNA studies.
- Sockeye trap-and-truck fish passage trials.
- Re-introduction of sockeye to Coquitlam Reservoir and related risks to drinking water.

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 and those of Fisheries and Oceans' Stewardship and Community Involvement program. 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 BCH's social responsibility policy, MOE's shared stewardship goal and the approach of DFO's Stewardship and Community Involvement Program. 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 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. 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 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.⁷ 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.

Priorities for FWCP Coastal were reviewed in 2009 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 priority setting was developed through consultation with agency staff. These were then reviewed and discussed at a

⁷ Watershed Restoration Plans may be obtained at the FWCP website:

<http://www.bchydro.com/bcrp/projects/watersheds.html>

series of open houses to allow First Nations, public stakeholders, and interested parties to comment and elaborate on the priorities.

The results from the Coquitlam Watershed workshop are summarized in Appendix A, highlighting the species, habitats, and specific activities as priorities for further work. On the aquatic side, coho, pink and sockeye salmon, steelhead, and cutthroat trout were viewed as the highest priority fish species in the lower Coquitlam River. Augmenting Chinook from the hatchery was also considered a high priority. Fish species of particular concern occurring in the Coquitlam were white sturgeon and eulachon, though no specific actions were identified at the workshop.

Species at Risk were also identified as priorities, in particular the need to improve the overall understanding of which species exist in the watershed, and to identify appropriate actions to conserve them. Due to the closure of the upper Coquitlam watershed for drinking water purposes there is little known about abundance and distribution of various species. Specific species of high priority included the Pacific Water shrew, elk, Black tailed deer, mountain goats, Western Screech owl, Spotted owl, Short-eared and Barn owls, Band-tailed pigeon, Northern goshawk, Great Blue heron, and several frog species. It should be noted these are not the only priorities or species at risk which might occur in the watershed, but these were specifically mentioned. Enhancing winter range for ungulates and conserving and improving wetlands and riparian areas were considered as high priority habitats for funding consideration.

The priorities emerging from the workshops were subsequently reviewed by BCH and Agency staff in relation to how well they addressed the strategic objectives, the extent to which species were impacted by footprint impacts, and what activities could provide multiple benefits to multiple species. The resulting direction for the Coquitlam River Watershed is to focus the next five year period on the development and implementation of three priority *Action Plans* for priority topic areas: Salmonids, Riparian / Wetlands and Species of Interest.

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4.3 PRIORITY ACTION PLAN SUMMARIES

The Salmonid and Riparian / Wetlands Action Plans focus on overall ecosystems in support of multiple fish and wildlife species. The objectives and sub-objectives within these two plans reflect the overall ecosystem focus, and the plans include primarily habitat-based actions, supported as required by research/information acquisition, assessments and monitoring/evaluation actions.

The Species of Interest Action Plan focuses on species of conservation concern (including species-at-risk) or other regionally important species for management planning process. The objectives, sub-objectives and actions within this plan reflect this focus on individual species.

All three priority action plans in the Coquitlam-Buntzen watershed provide broad support to the FWCP strategic sustainable use objective.

The three priority action plans for the Coquitlam-Buntzen watershed are summarized below. The full plans can be accessed on the FWCP website ([provide](#)).

SALMONID ACTION PLAN

Rationale

Salmonid species in general have been heavily impacted by the creation of dams and hydroelectric facilities in the Coquitlam system. Limiting factors for salmonids in the Coquitlam watershed vary among species and include useable habitat for rearing and spawning in the Lower Coquitlam. This overall action plan for salmonids includes integrated habitat restoration planning and analysis to determine actions that provide the most benefit to multiple species.

Conservation priorities for salmonids include coho, steelhead, pink, cutthroat, sockeye, and Chinook. There are no actions at this time directed to resident salmonids.

The bulk of money spent in the Coquitlam system to-date has been towards enhancement activities, conservation and research of salmonid species on the Coquitlam River. New activities should help determine the effectiveness of previous work, identify and assess new off-channel habitat, and continue with studies associated with maintaining genetic diversity.

Focus

1. Assessment of the effectiveness of existing habitat enhancements in terms of adult returns and escapement, including maintaining chum productivity (periodic gravel placement etc.).
2. Identification and assessment of restoration efforts, including off-channel and tributary restoration opportunities, such as Or Creek, Swaboda Channel, etc. Upgrade and enhance existing restoration work and assess its effectiveness
3. Continue to study options for sockeye re-anadromisation.

Expected outcome

- Improved habitat capacity and productivity in multiple stream systems
- Sustained abundance of anadromous and resident salmonid populations at target levels over time.
- Improved targets for both habitat capacity (pre-development) and abundance for all salmonid species.

SPECIES OF INTEREST ACTION PLAN

Rationale

'Species of interest' are defined as species of conservation concern (including species-at-risk) or other regionally important species.

Species at Risk are a priority for all agencies and partners. Some Species at Risk, such as the Great Blue heron, are known to exist in the Coquitlam Watershed. For other species however, there is a lack of information and knowledge regarding which may potentially exist and what opportunities are available to protect them.

Generally, habitat is a limiting factor, particularly as much of the area is urbanized and is in privately owned lands, or lies within Metro Vancouver's drinking water area and is closed to the public. To build on previous efforts, more information is needed regarding how effective past efforts have been. More knowledge is needed regarding which species exist, in which habitats, and the opportunities available for their protection. Also, needed is a strategy for evaluation and monitoring that will support the ongoing process of renewing species plans and priorities in the Coquitlam River system..

Focus

1. Build upon the past efforts associated with the identified FWCP priority species of concern in the Coquitlam River watershed.
2. Conduct actions for currently known species such as heron nests, and support for existing recovery plans (Pacific water shrew)⁸
3. Conduct mapping and prioritization of activities for additional species of concern, including identification of opportunities for conservation and restoration.

Expected outcome

- Improved knowledge and status of FWCP priority species of concern.
- Improved habitat mapping for species of concern.
- Identification and prioritization of species, locations and potential future actions for conservation and protection.

RIPARIAN AND WETLANDS ACTION PLAN

Rationale

Riparian and wetland areas have been impacted by the creation of dams, and continue to be severely degraded in the remaining areas due to urbanisation. Habitat is the limiting factor for many species, including fish, which depend upon them, either for the majority of their lifecycles or for key periods such breeding. Riparian and wetland areas are extremely diverse and biologically rich and are considered as highly valuable from an ecological standpoint.

Some work on riparian and wetland restoration or conservation has occurred in the Coquitlam around Colony Farm. However more work would have increased benefits and riparian/wetlands as these ecosystems have a high restoration potential and would benefit from additional restoration

⁸ Available at

http://www.env.gov.bc.ca/wld/documents/recovery/rcvrystrat/pacific_water_shrew_rcvry_strat040609.pdf

activities. Several areas have been identified as priorities, such as Colony Farms and the Coquitlam River Management Area.

Focus

1. Mapping of current wetlands and riparian areas, and categorization of areas into healthy and functioning systems (Category 1), and degraded or sub-optimal areas that would benefit from restoration (Category 2). Including:
 - Colony Farm and Coquitlam Management Area.
 - Landsdowne and Falcon Wetlands.
2. Assessment of opportunities for securement (conservation) and protection (from potential degradation) of Category 1 areas. This includes assessment of legal status, ownership, land use, etc.
3. Assessment of opportunities to enhance and restore Category 2 areas, with a subsequent view to conserve and protect them.

Expected outcome

- Identification and prioritization of locations and potential future actions for conservation, protection, restoration and creation of wetland and riparian habitats.

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5 REFERENCES

- BC Hydro 2003 Coquitlam-Buntzen Project Water Use Plan. Report of the Consultative Committee, June 2002.
- BC Hydro. 2005. Coquitlam-Buntzen Project Water Use Plan. Revised for acceptance by the Comptroller of Water Rights. Available at:
http://www.bchydro.com/etc/medialib/internet/documents/environment/pdf/wup_coquitlam_water_use_plan_pdf.Par.0001.File.wup_coquitlam_water_use_plan.pdf.
- BC Hydro. 2008. Fish passage decision framework for BC Hydro facilities.
- Bridge-Coastal Restoration Program. 2003. *Revised Strategic Plan*, Volume 2, Watershed Plans, Chapter 8: Coquitlam River and Buntzen Lake. Available at:
http://www.bchydro.com/bcrp/about/strategic_plan.html
- Bridge Coastal Restoration Program. 2009. Coquitlam River workshop summary, Coquitlam BC, February 17, 2009. Available at: http://www.bchydro.com/bcrp/about/strategic_plan.html
- MacDonald, A. 2009. Fish & Wildlife Compensation Program: Executive Summary. Report for BC Hydro, Vancouver, BC.

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APPENDIX A

List of potential opportunities for fish and wildlife

The following list of species, ecosystems and actions were identified by agencies, First Nations and communities as being the top priorities for activities under the FWCP program. Following initial input from agencies, a multi-stakeholder workshop was held in Coquitlam (17 February, 2009) to identify priorities. Two breakout groups, for fish and wildlife, identified priorities which were reviewed in plenary to allow all participants to comment on the findings.

HABITATS

Habitat	FWCP Rank	Comments
Wetlands/ Riparian Habitat	high	<p>Long-term conservation and restoration of the areas to more natural conditions is necessary.</p> <p>Areas of importance for restoration include Colony Farm and the Coquitlam River Wildlife Management Areas. As these areas are already productive, care must be taken to avoid any negative impacts of enhancement.</p> <p>The Lansdowne and Falcon wetlands present good potential for wetland habitat projects, as they are not accessible to fish. Inventory is needed before projects can be undertaken.</p> <p>Coquitlam reservoir habitat assessment and inventory is necessary.</p> <p>Projects must avoid creating bullfrog habitat.</p> <p>Signage would be beneficial at Colony Farm to inform the public that the area is a managed wetland.</p>
Ungulate Winter Range	priority not given	<p>Winter range enhancement above the dam is not possible, and there are few opportunities below the dam.</p> <p>Forest management practices should be consistent with the Metro Vancouver Watershed Management Plan (it is drinking water supply area).</p>

FISH

Species	FWCP Rank	Comments
Coho Salmon	high	<ul style="list-style-type: none"> Maintenance and upgrading of existing habitat areas is of very high priority. Feasibility studies are needed to determine the best opportunities for new sites and projects.

Species	FWCP Rank	Comments
		<ul style="list-style-type: none"> • Focus should be on small off-channel and tributary developments that increase rearing capacity (smolt marine survival is decreasing). • Multi-year follow-ups are necessary. • Dyke removal should be considered as a possible means of habitat restoration. Flood issues would need to be considered, and consultation and support from the Cities, Kwikwetlem First Nation and other stakeholders would be necessary (depending on the location chosen).
Pink Salmon	high/ med	<ul style="list-style-type: none"> • Hatchery augmentation is of high priority. It would provide labour to collect additional eggs, which would enable stocking every two years. • Feasibility assessments and spawner distribution assessments to identify sites and opportunities between the dam and Orr Creek are of medium priority. Projects to improve spawning could then be undertaken.
Sockeye Salmon	high	<ul style="list-style-type: none"> • Completion of feasibility assessments for fish passage and the re-anadromization of Kokanee are of high priority. • Annual monitoring for possible sockeye returns that have resulting from releases of kokanee in 2005 are of high priority. • A fishway project at Coquitlam Dam is of medium priority. Proper assessments of the benefits and costs of fish passage work are necessary. Work done at Alouette Dam should inform these assessments. • Improvement of the outmigration of smolts is of very high priority. Migration of smolts through the tunnel should also be addressed.
Cutthroat Trout	high	<ul style="list-style-type: none"> • The species is blue-listed. • Assessment of the tributaries is necessary to establish current use, limiting factors, restoration opportunities and access. Access to the tributaries should be improved through the removal of man-made obstructions or the creation of access around them. • Baseline data on the species is needed, as current data is limited.
Steelhead	high	<ul style="list-style-type: none"> • Feasibility studies are necessary to determine side channel sites and project opportunities. Small side channel and tributary development projects could then be undertaken. • Opportunities need to be identified for projects to create parr habitat by adding large woody debris and pools to the mainstem. • Hatchery augmentation should be considered as a means to increase smolt numbers. • A fishway at the dam should be considered as means to open up new habitat areas for steelhead restoration. • A stranding assessment could identify areas that would benefit from re-contouring efforts, such as perched side channels.

Species	FWCP Rank	Comments
Chinook Salmon	high/ med	<ul style="list-style-type: none"> Hatchery augmentation is of high priority. It would enable spawning timing to shift one month earlier. Early run adults could be captured and transported to the Chilliwack hatchery. Assessment of spawner density, distribution and feasibility of restoration works above Orr Creek is of medium priority. Projects to improve rearing by improving access to off-channel habitats in the floodplain of the lower river are of medium priority Restoration works above Orr Creek are of low priority. Existing works and already approved projects will provide sufficient habitat over the short term. Chinook have benefited from the additional Water Use Planning flows in the river. As these flows have recently increased, there may also be increased benefits.
Chum Salmon	low	<ul style="list-style-type: none"> As chum habitat is not limiting and populations appear to be increasing, chum restoration works are not a priority at this time. Ongoing monitoring of chum and other species is of high priority, but is currently a part of Water Use Planning strategies.
Fraser River White Sturgeon	high	
Eulachon	high	

MAMMALS

Species	FWCP Rank	Comments
Species at Risk in General (SAR)	high	<ul style="list-style-type: none"> Species at Risk in the SFN Watershed are listed in the following section.
All wildlife	high	<ul style="list-style-type: none"> Due to access closure of upper Coquitlam, inventory information for almost all species is lacking. Lack of knowledge of occurrence, distribution and abundance is a major impediment to management.
Pacific Water Shrew	high	<ul style="list-style-type: none"> Projects should link to recovery team activities and Best Management Practices. This species should be considered when conducting fish restoration projects. Habitat mapping and inventory are necessary, as the current lack of data presents management problems. Caution must be taken when sampling this species, as it can lead to fatalities. There is a Conservation Data Centre recorded occurrence in Mundy Park. There was also a sighting opposite the gravel mines. The CDC must be consulted before any projects directed at this species are

		undertaken.
Roosevelt Elk	high	<ul style="list-style-type: none"> • Forest enhancement activities must be consistent with the Metro Watershed Management Plan. • Riparian conservation and covenants are of high importance. • Monitoring of a new population in the upper Coquitlam watershed may be necessary.
Black-tailed Deer	high	<ul style="list-style-type: none"> • Winter range securement, enhancement and access management would be beneficial, but opportunities are limited.
Mountain Goat	high	<ul style="list-style-type: none"> • Winter range securement, enhancement and access management would be beneficial, but opportunities are limited. • A herd has been observed in upper Coquitlam. • A mineral lick site enhancement project would be beneficial.
Furbearers	low	<ul style="list-style-type: none"> • Inventory and landscape-level habitat management would be beneficial.
Wolverine	priority not given	<ul style="list-style-type: none"> • There was an occurrence of the species in the Upper Pitt watershed. The species travels a lot, so it is likely entering the Coquitlam watershed. • The wide range of the species may decrease the effectiveness of management actions.

BIRDS

Species	FWCP Rank	Comments
Western Screech-Owl	high	<ul style="list-style-type: none"> • Species is classified as a Species at Risk, with habitat restoration and securement potential. • Species is a riparian-dependent secondary cavity nester, requiring minimum diameter trees. • Inventory is necessary. There is an annual nocturnal owl survey conducted by Metro Vancouver on the east side of the watershed, which could be expanded to collect better data on western screech owls.
Spotted Owl	high	<ul style="list-style-type: none"> • Inventory and landscape-level management are necessary. • The species has high restoration potential. The possibility exists for a release of captive-bred owls into the watershed. • Barred owl predation has a significant negative impact on the species.
Short-eared Owl and Barn Owl	high	<ul style="list-style-type: none"> • Inventory and landscape-level management are necessary.
Band-tailed Pigeon	med	<ul style="list-style-type: none"> • The securement of critical mineral lick sites is necessary.
Northern Goshawk	med	<ul style="list-style-type: none"> • Breeding habitat conservation and landscape-level management are

		necessary.
Great Blue Heron	high	<ul style="list-style-type: none"> Classified as a Species at Risk with riparian nesting and foraging habitat restoration potential. The available habitat is restricted, so a long-term plan is necessary to grow new habitat. There is a very significant heron colony in the Coquitlam River Management Area (~80 nests). Further encroachment by the Mary Hill bypass (depending on plans for the gateway) will put the Coquitlam River Management area at risk. It is necessary to protect the Colony Farm open fields, as heron depend on them for foraging. Hérons may eat painted turtles, so it is necessary to situate habitat restoration projects accordingly.
Bald Eagle	med	<ul style="list-style-type: none"> Nesting and roosting habitat conservation are necessary.
Riverine Birds (Mergansers, American dipper, Harlequin duck)	med	<ul style="list-style-type: none"> Water quality, stream productivity, fisheries relationships and riparian conservation are important. Research is needed on genetics, the dispersal of birds between river systems, and the connectivity of populations over larger scales.
Marbled Murrelet	med	<ul style="list-style-type: none"> Landscape-level nesting habitat management is necessary, as old-growth characteristics are required.
Swallows and Bats	priority not given	<ul style="list-style-type: none"> A decrease in the abundance of these species from Burnaby Mountain down to Burnette highway has been noticed. It is possible that this is a result of mosquito control in cities.

AMPHIBIANS, REPTILES AND TURTLES

Species	FWCP Rank	Comments
Red-legged Frog and Coastal-tailed Frog	high	<ul style="list-style-type: none"> Priorities include the conservation of streams, wetlands, riparian habitats and covenants on private land. Water quality initiatives, inventory and research are necessary. The red-legged frog serves a good indicator species, and they are particularly dependant on wetlands. The coastal-tailed frogs prefer fast-moving streams as habitat.
Painted Turtle	priority not given	<ul style="list-style-type: none"> A sighting of the species in the watershed needs to be confirmed, and if necessary, more information gathered. There are large turtles at Colony Farm; their species needs to be confirmed.

Wildlife Species at Risk that Occur or Could Occur in the Coquitlam River watershed

	COSEWIC	CF Rank
Mammals		
Pacific Water Shrew	Endangered	5,6,1
Birds		
Northern Goshawk (laingi subspecies)	Threatened	1,6,1
Marbled Murrelet	Threatened	1,6,1
Western Screech Owl (kennicottii subspecies)	Special Concern	3,1,2
Great Blue Heron (fannini subspecies)	Special Concern	3,6,1
Barn Owl	Special Concern	6,2,3
Short-Eared Owl	Special Concern	6,2,3
Spotted Owl (caurina subspecies)	Endangered	5,6,2
Amphibians and Reptiles		
Red-Legged Frog	Special Concern	3,1,2