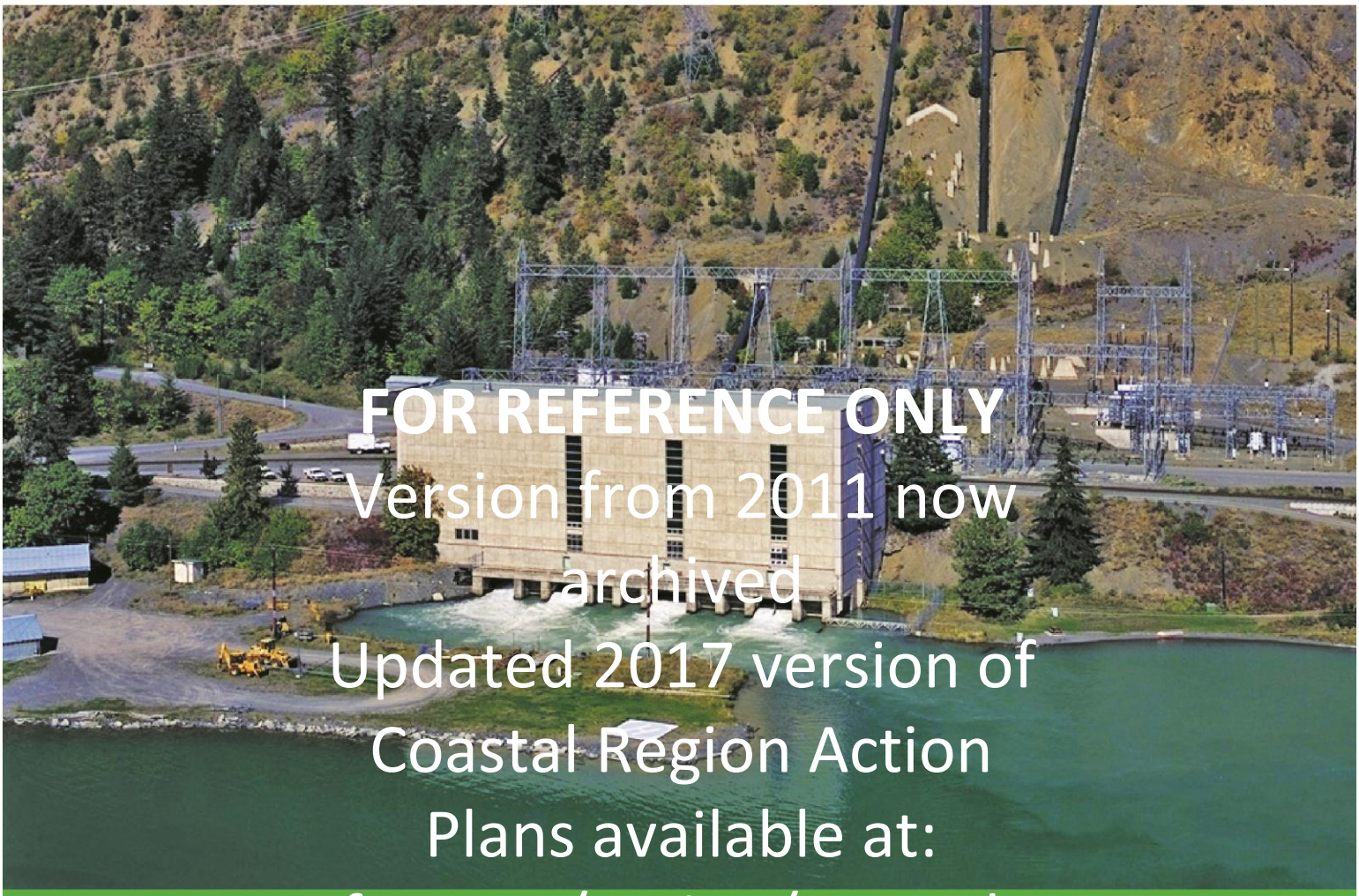

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FISH AND WILDLIFE COMPENSATION PROGRAM

BRIDGE/SETON RIVER WATERSHED

RIPARIAN AND WETLANDS ACTION PLAN

FINAL DRAFT

The FWCP is a partnership of:

BC hydro FOR GENERATIONS

BRITISH COLUMBIA

Canada

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Pêches et Océans Canada

OCTOBER 2011

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Bridge-Seton Rivers Watershed Riparian and Wetlands 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 Riparian and Wetlands Action Plan sets out priorities for the Fish and Wildlife Compensation Program to guide projects in the Bridge-Seton Rivers project area. It identifies actions to be undertaken in the Bridge watershed and the Seton watershed including Anderson Lake and the lower parts of Cayoosh Creek, which are collectively referred to here as the Bridge-Seton system. The plan builds on the FWCP's strategic objectives and the Bridge-Seton Rivers Watershed Plan (FWCP, 2011). Action plans have also been developed for species of interest 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[1] to allow First Nations, public stakeholders, and interested parties to comment and elaborate on the priorities.

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.

[1] Lillooet (26 March 2009)

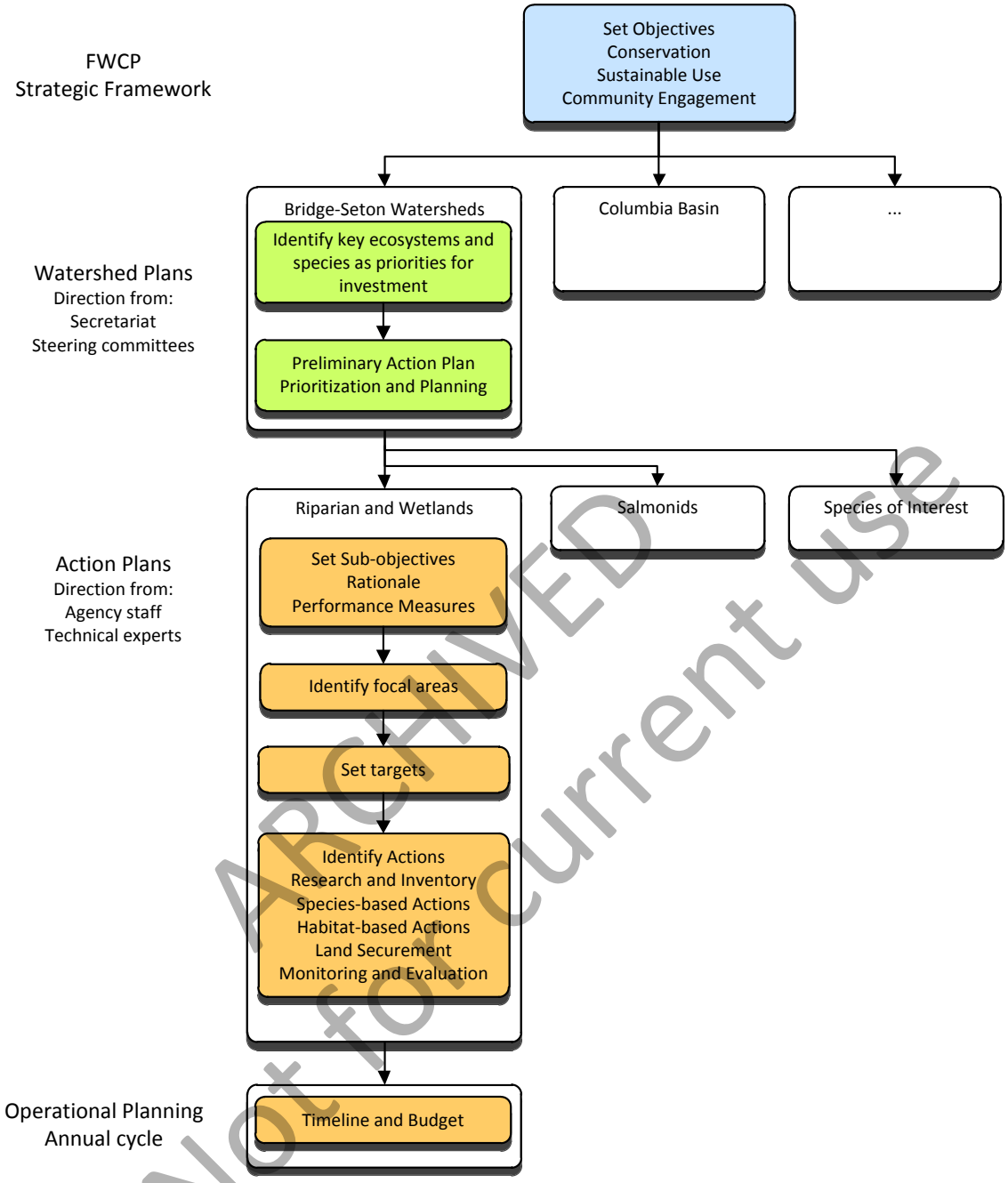

Figure 1: Relationship between the Riparian and Wetlands Action Plan and higher level planning and objectives.

2. OVERVIEW CONTEXT

The Bridge and Seton watersheds are located in the rain shadow of the southern Coast Mountains, about 200 km northeast of Vancouver. The two watersheds are adjacent and separated by the Bendor Range and Mission Ridge. Together, they drain an area of approximately 3,700 km^2. Elevations range from 236 m at the confluence with the Fraser River to rugged peaks of about 3,000 m, and steep-sided slopes and broad lower valleys predominate. The Bridge River flows into the Fraser River just north of the town of Lillooet, and the Seton River meets the Fraser immediately south of the town (Figure 2).

The Bridge and Seton rivers are primarily affected by continental and modified maritime weather producing high snow pack in the winter and occasional short-duration rainfall between June and July. The hydrograph is dominated by snowmelt between May and August. Inflow is usually low from September to April, but autumn storm events result in occasional large inflows. The source of Bridge River is the Bridge Glacier covering 140 km^2 of the upper watershed.

The Bridge Seton watershed has a total human population of approximately 4,500, of which almost 3,000 are located near Lillooet. Other communities include Gold Bridge, near the La Joie Dam, and Yalakom on the lower Bridge River. It is within the traditional territory of the St'at'imc Nation and indigenous people from the majority of the population. The watersheds contain the Spruce Lake protected area.

The Bridge River project consists of La Joie Dam, which impounds Downton Reservoir, and Terzaghi Dam, which impounds Carpenter Reservoir. Water is diverted through tunnels and penstocks from Carpenter Reservoir to two powerhouses on the shore of Seton Lake Reservoir. Downton Reservoir has a total average inflow of 40 m^3/s. Additional inflow to Carpenter Reservoir is 51 m^3/s for a total diversion of about 91 m^3/s into Seton Lake; the licensed diversion from Bridge River is 147 m^3/s.

When Terzaghi Dam was completed in 1960 (and the Mission Dam before it in 1948), no continuous releases from Carpenter Reservoir were required, and any flows in the lower Bridge River derived exclusively from groundwater and inflow from tributaries. With the exception of occasional spills over the dam to manage unpredictable high inflows, a 4 km stretch of channel immediately below the dam was left essentially dry, and the other 15 km experienced a more than hundred-fold reduction in flow (Failing et al. 2004). In the late 1990s, Terzaghi Dam was modified to allow continuous flow release, and since August 2000 BC Hydro has implemented an average release of about 3 m^3/s. The magnitude of the release is still managed under an adaptive management program. The dam remains impassable for fish.

The Seton project consists of Seton Dam at the outlet of Seton Lake, where water is diverted by canal then penstock to a powerhouse on the banks of the Fraser River downstream of the natural Seton-Fraser confluence. The Cayoosh Dam (owned and operated by Walden North) diverts water from Cayoosh Creek via

tunnel to Seton Lake near its outlet. About 80% of the total discharge through the Seton powerhouse comes from the Bridge River diversion. The Seton Dam incorporates fish passage structures, which allow anadromous salmon to ascend beyond the outlet of Seton Lake.

Seton Lake has a total average inflow of about 117 m^3/s: 19 m^3/s comes naturally from within the Seton basin, 16 m^3/s from the Cayoosh Creek diversion, and 91 m^3/s from the Bridge River diversion. The seasonal flow regime of the Bridge River watershed dominates the operation of Seton Lake Reservoir.

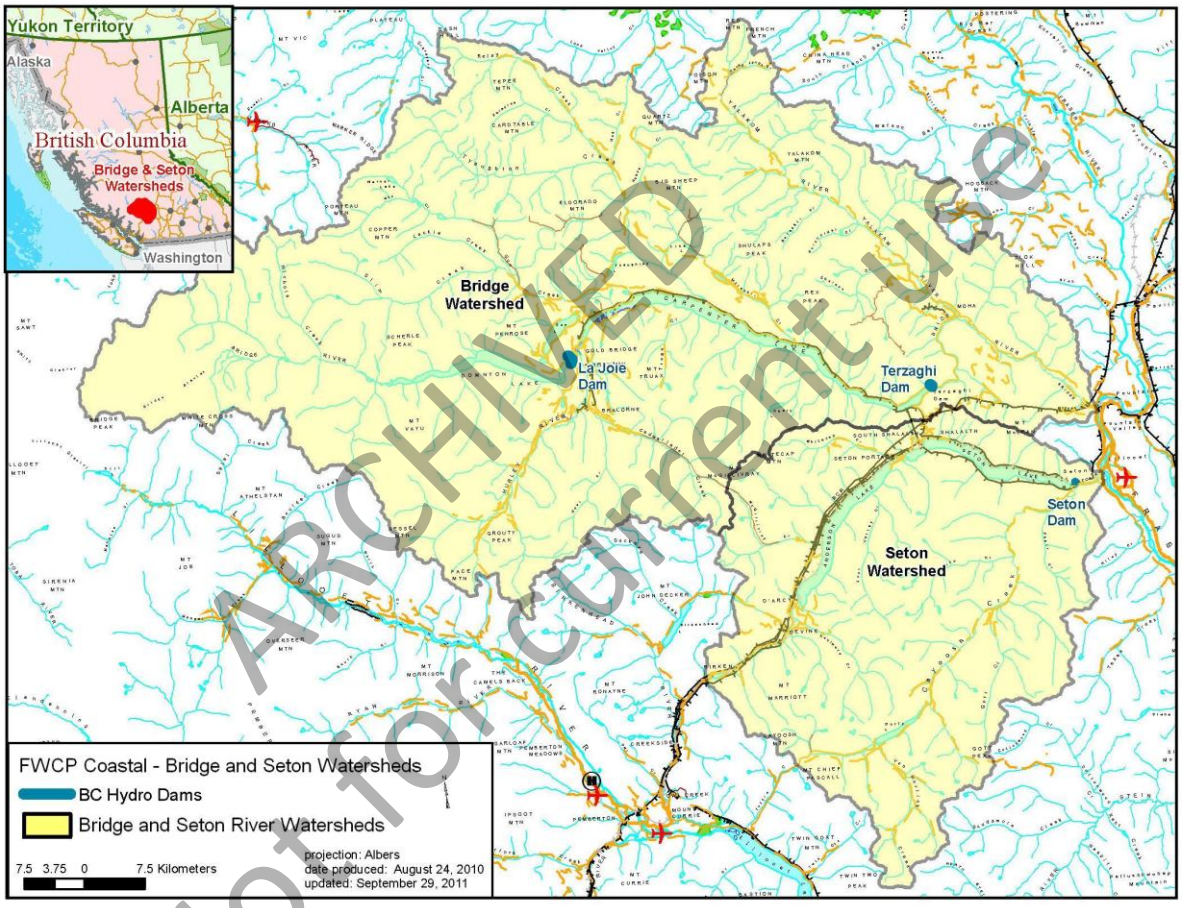

Figure 2. The Bridge Seton hydropower project.

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, Chapter10: Bridge River and Chapter 11: Seton River (December 2000);
- Bridge River Water Use Plan Consultative Committee Report (December, 2003); and
- Findings in the Community Workshop (Lillooet, March 26, 2009).

Hydro-related Impacts — Footprint impacts of structures, reservoirs and their operations, have occurred throughout the system and are described as follows, based on location.

Upstream of La Joie Dam (Downton Reservoir and upper Bridge River).

1. The impoundment flooded:
    - 2234 ha of land, significant loss of valley bottoms, riparian and side habitat for bighorn sheep, other ungulates and carnivores,
    - 65 km of mainstem, 441 ha of side channels, and 390 ha of adjacent riparian areas,
    - 25 km of tributary habitat and 75 ha of adjacent riparian area, and
    - 237 ha of wetlands - feeding/breeding habitat for ducks and furbearers, and feeding habitat for bears & ungulates.
2. Construction of La Joie Dam sluiced a large volume of sediment that degraded downstream habitat in the Middle Bridge River.
3. Access roads reduced instream and riparian habitat.
4. Large annual drawdown (as much as 49m) in Downton Reservoir affects access to tributaries and the establishment of aquatic and riparian vegetation.
5. Flooding of mainstem and tributaries created a barrier to wildlife particularly bears and ungulates.
6. The creation of open water for osprey and waterfowl, as well as the flooding of forest areas created snags and nesting cavities.

Upstream of Terzaghi Dam to La Joie Dam (Carpenter Reservoir and middle Bridge River).

7. The impoundment flooded
    - 4996 ha of land, loss of valley side habitat for bighorn sheep, other ungulates and carnivores,
    - 92 km of mainstem, 761 ha of channels, and 552 ha of adjacent riparian areas,

- 55 km of tributary habitat and 165 ha of adjacent riparian area, and
- 46 ha of wetlands - feeding/breeding habitat for ducks and furbearers, and feeding habitat for bears & ungulates.

8. Terzaghi Dam blocked fish passage for anadromous and resident migratory fish.
9. Loss of salmon resource above the dam as a food source for grizzly bears, scavengers, and piscivorous birds feeding on fry and smolts.
10. Barriers to migration of mammals, particularly bears and ungulates.
11. Large annual drawdown (as much as 44m) in Downton Reservoir affects access to tributaries and the establishment of aquatic and riparian vegetation.
12. Change in flow regime of the remaining river has unknown effects on wildlife.
13. The creation of open water for osprey and waterfowl, as well as the flooding of forest areas created snags and nesting cavities.

Bridge River downstream of Terzaghi Dam.

14. Reduced flows downstream of Terzaghi Dam reduced wetted area and access to off-channel habitats. Despite the reduced flows, inflows from tributaries and groundwater provided a relatively productive area. Since August 2000, BC Hydro has provided a fish flow release of about 3 m^3/s. The benefits of this release are currently under study.
15. Spills can strand and kill fish or displace them downstream
16. Terzaghi Dam has reduced gravel and LWD recruitment to the lower river.
17. Periodic spilling scours gravel and degrades downstream habitat, strands or displaces fish and may temporarily increase TGP.
18. Reduced flow has altered temperature in the river, potentially benefiting fish, particularly in the summer. Less cold water from the Bridge has likely increased water temperature below the Yalakom confluence. Conversely, in the winter the water from the Bridge system was warmer than Yalakom water and so the water temperature below the confluence is now colder.
19. Reduced flows in the 49.5 km of the lower Bridge River has unknown effects on aquatic wildlife such as American Dipper and Harelquin.

Upstream of Seton Dam (Seton Lake).

20. The impoundment flooded

- 2503 ha of lake and 52km of shoreline, loss of coniferous forest,
- 27 ha of land, and
- 0.5 km of mainstem, 3 ha of channels, and 3 ha of adjacent riparian areas.

21. Diversion from Bridge River and the Seton Dam raised the level of Seton Lake, resulting in inundation of 27 ha land around the lake.
22. Adult pink salmon are impinged on screens at power canal intake structure.
23. Adult salmon are attracted to discharges greater than 60 m^3/s through the radial gate and are delayed ascending the fish ladder.
24. The fish ladder does not accommodate large Chinook or sturgeon.
25. Dredging during construction caused a major loss of spawning habitat for pink salmon and other species.
26. Water chemistry, temperature, water clarity and nutrients have been altered significantly since the diversion of Bridge River water into the system.
27. Flooding of shoreline created snags and nesting sites.

Lower Seton River.

28. Larger spills since the Bridge River diversion has scoured gravel and reduced spawning and rearing habitat. Spills also cause the stranding of fish.
29. Cooler water from Bridge River may benefit upstream migration, however migrating fish are delayed at entrance to the spawning channels.
30. Present flow releases at Seton Dam restrict instream habitat and access to former off-channel habitat.
31. Seton Dam has reduced LWD recruitment to the river.
32. Reduced flows have unknown effect on aquatic wildlife.

Bridge to Seton Diversion

33. Anadromous salmon homing to the Bridge and Seton rivers are attracted to the tailrace at the Seton generating station on the Fraser River.
34. Potential temperature stress on Fraser upstream migrants trying to pass Bridge River Rapids due to loss of cool Bridge discharge.

Cayoosh Diversion

35. Partial mitigation is provided for Seton fish by diverting Cayoosh Creek water to Seton Lake.

36. Juvenile sockeye and pink salmon are impinged on trash racks and entrained into the Seton power canal.

37. Diversion of Cayoosh water from July to November assist sockeye to home to Seton River and not the tailrace discharge (positive effect).

38. Diversion diminishes available habitat area in the downstream channel.

39. Diversion has diminished gravel and LWD in downstream channel.

40. Reduced flows have unknown effect on aquatic wildlife.

Seton to Fraser Diversion

41. Juvenile sockeye and pink salmon are impinged on the penstock intake.

42. Seton adult spawners are attracted, delayed or injured at the tailrace before finding the Seton River. This is partially mitigated by controlling the % of Cayoosh Creek water diverted into Seton Lake.

43. Seton canal (4.6 km) is a hindrance to the movement of animals.

Non-Hydro Impacts — Other impacts in the Bridge-Seton watersheds include mining (particularly in the area of Gold Bridge around Ferguson Creek), forestry, and rail and road construction, in particular rail construction near Seton Lake likely filled limited shoal areas. Also, the slides in the Fraser River at Hell's Gate in 1913 and 1914 negatively affected anadromous fish passage into the Bridge-Seton watersheds. Fish passage at Hell's Gate was established in 1945 and extended in 1956; however, fish stocks took a long time to recover. The effects of the Hell's Gate slides are thought to have contributed to underestimating the productivity of Bridge-Seton fish stocks during evaluation of hydro-development in the watersheds. Urban development has not been a significant factor in the area.

2.2 LIMITING FACTORS

The limiting factors for wetland and riparian areas are predominantly related to extent of the available habitat, connectivity and distribution of the habitat, and its productivity.

Extent

The contribution of riparian and wetland habitats to broader ecological function is predominantly limited by the extent of the habitats on the land base. Habitats are lost through inundation and conversion to other land uses, and often detrimental fluctuations in water levels.

Distribution

Connectivity among riparian and wetland habitats, and between these habitats and other habitats and features, are important for dispersal of plants and animals and for seasonal movements of some species. Wetland and riparian habitats that are isolated will likely have decreased diversity to those which experience a healthy connectivity between areas. Distribution is therefore related not only to the extent of healthy riparian and wetland habitats, but also to adjacent land uses.

Productivity

Even where riparian and wetland habitats are adequately represented and connected, there are several factors that can affect their productivity:

- Hydrologic conditions such as water level variability and flow rates are among the most important variables driving riparian and wetland habitat development, structure, functioning and persistence (National Research Council 2001). Hydrologic conditions also influence the extent and distribution of habitats. For example reduced peak flows in a river, due to regulation, result in succession to upland habitat types. Also, Extreme fluctuations both in timing and extend, such as in a drawdown zone of reservoirs, can reduce the ability of plant communities to be established and thus the establishment of wetlands.
- Stressors such as invasive species or disruptive human access can affect community structure and function.
- Loss of specific habitat features can affect life requisites of specific species, e.g., dense nesting cover for waterfowl, suitable tree cavities for nesting owls or waterfowl, loafing sites to turtles.
- Poorly understood factors limit the productivity of created wetlands. These are generally thought to be related to unnatural hydrologic regimes, soil conditions, and/or cattle grazing (e.g., Atkinson et al. 2010).

2.3 TRENDS AND KNOWLEDGE STATUS

HABITAT TRENDS

Basin-wide trends in the abundance, distribution and productivity of riparian and wetland habitats have not been compiled (other than direct BC Hydro footprint impacts conducted in 2000). The area of inundation has not increased since dam construction, but the productivity of adjacent habitats may be affected by increased activity and traffic.

The major significant marsh and grassland occurs in the north-west end of Carpenter reservoir. As it is seldom completely inundated, it supports a valley

bottom covered with short grasses, horse tails and flood tolerant shrubs (Hall, 2007). The greening of the dry reservoir bottom in early spring allows for foraging for mammals and birds.

The lower Bridge River flows through a large alluvial cobble-boulder matrix with a few areas that support standing pools and wetland habitat. Black cottonwoods, mountain alder, Sitka willow and aspen are common riparian species. No significant riparian or wetland development has been undertaken by FWCP partners or other organisations in the region. However, experimental flow releases from Terzaghi dam of $3m^2/s$ have resulted in significant growth of juvenile black cottonwoods and resulted in the establishment of saplings (Hall, 2007).

Riparian and wetland habitat losses can be monitored via remote sensing, air photo interpretation or ground reconnaissance. Assessing deterioration in habitat productivity is more difficult.

KNOWLEDGE GAPS

Some habitat mapping has been completed for species specific activities, including owls and amphibians. In most cases there is limited knowledge regarding the abundance, location and productivity of either riparian areas or wetlands in the Bridge-Seton River Area.

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 riparian and wetland species and habitats. Complementary actions may also be identified in the separate Species of Interest Action Plan.

There are three general categories of riparian and wetland habitats defined for setting objectives:

Category 1 Natural riparian or wetland habitat:	Largely intact ecosystems with natural disturbances sufficient to maintain subclimax communities and processes characteristics of wetlands and riparian ecosystems.
Category 2 Disclimax or degraded wetland or riparian habitat, or creation of habitat	Formerly natural wetland or riparian ecosystems that have lost most or all of their natural disturbance regime and are no longer functioning effectively as wetland or riparian habitat. These areas are candidates for restoration or creation or wetlands.
Category 3 Restored or created riparian or wetland habitat:	Ecosystems resulting from water impoundments, diversions or other artificial disturbances that require active management to maintain productivity and function.

The categories contrast different levels of ecosystem function that require different management approaches. Note that there are no category 3 wetlands in the Bridge-Seton Watershed system at this time.

3.2 OBJECTIVES, MEASURES AND TARGETS

There are two riparian and wetlands management objectives for the Bridge-Seton River system as a whole.

Objective 1. **Ensure productive and diverse wetland and riparian ecosystems.**

Rationale — This objective addresses overall ecosystem integrity and directs compensation activities to develop productive, useable habitats. Riparian and wetland areas have been heavily impacted by the creation of dams, and continue to be severely degraded in the remaining areas. They may be 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 the most diverse and biologically rich terrestrial ecosystems in BC and are considered as highly valuable from an ecological standpoint. They are often critical in terms of maintaining function and structure for natural system, including helping to support trophic level functioning, genetic diversity, as well as providing key ecological services such as erosion control, flood control and assimilation of nutrients.

To date, FWCP has not significantly funded restoration of riparian areas or wetlands in the Bridge-Seton watershed. However, these areas have a high restoration potential and would benefit from restoration activities.

This objective is supported by three sub-objectives:

Sub-objective 1: Secure remaining Category 1 riparian and wetland habitat.

Rationale —Wetland and riparian areas can be heavily impacted by conversion to other lands uses, such as agriculture development or forestry, amongst others. Securing remaining habitat to prevent loss is very important. Habitat is considered secure if it is protected from conversion to other land use, for example by purchasing the land or negotiating a covenant agreement.

As opportunities in the Bridge-Seton system may be limited, consideration could also be given to secure off-site category 1 wetlands that would help compensate losses in the Bridge-Seton system. In dollar terms and effort there may be more effective opportunities off-site to provide compensation for habitat losses.

***Measure* —** Hectares (or percentage) of Category 1 riparian and wetland habitat secured or conserved over a 5 year period.

***Targets* —** Specific targets will be developed as part of the action plan implementation as current areas are not known.

Sub-objective 2: Reduce threats to Category 1 riparian and wetland habitat.

***Rationale* —** Wetlands and riparian areas are subject to a variety of threats both internally and externally. Many naturally functioning riparian and wetland habitats (Category 1) can benefit from management actions that reduce specific threats (e.g., treatment for invasive species, access control, forestry in adjacent areas etc.).

***Measure* —** Hectares (or percentage) of Category 1 riparian and wetland habitat improved annually.

***Targets* —** Specific targets will be developed as part of the action plan implementation as current areas are not known.

Sub-objective 3: Restore degraded or create new riparian and wetland habitat (Category 2).

***Rationale* —** While conservation of existing high quality habitat is always preferable, category 1 habitat may be limited or the opportunities for conservation are difficult. Restoration opportunities may be more available in areas where changes in water regime have altered successional pathways in pre-existing riparian and wetland ecosystems. Typically the regime in managed watersheds becomes more stable. Riparian and wetland ecosystems require the disturbances caused by fluctuating water levels to maintain their productivity. When these disturbances are reduced or eliminated, riparian and wetland ecosystems

transition to other ecosystem types. Projects can be designed to restore the original ecological function of these areas, or to create new riparian or wetland habitats that differ from what was present historically, but still represent an improvement in function.

Measures — Hectares of riparian and wetland habitat that are restored of created over 5 year period.

Targets — Specific targets will be developed as part of the action plan implementation as current areas are not known.

Objective 2. Maintain or improve opportunities for sustainable use.

Rationale — Many wetland and riparian species are the focus of sustainable use activities by First Nations and non-first nations people. For example some riparian and wetland dependant 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 PLAN

4.1 OVERVIEW

The Action Plan has several individual actions 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.

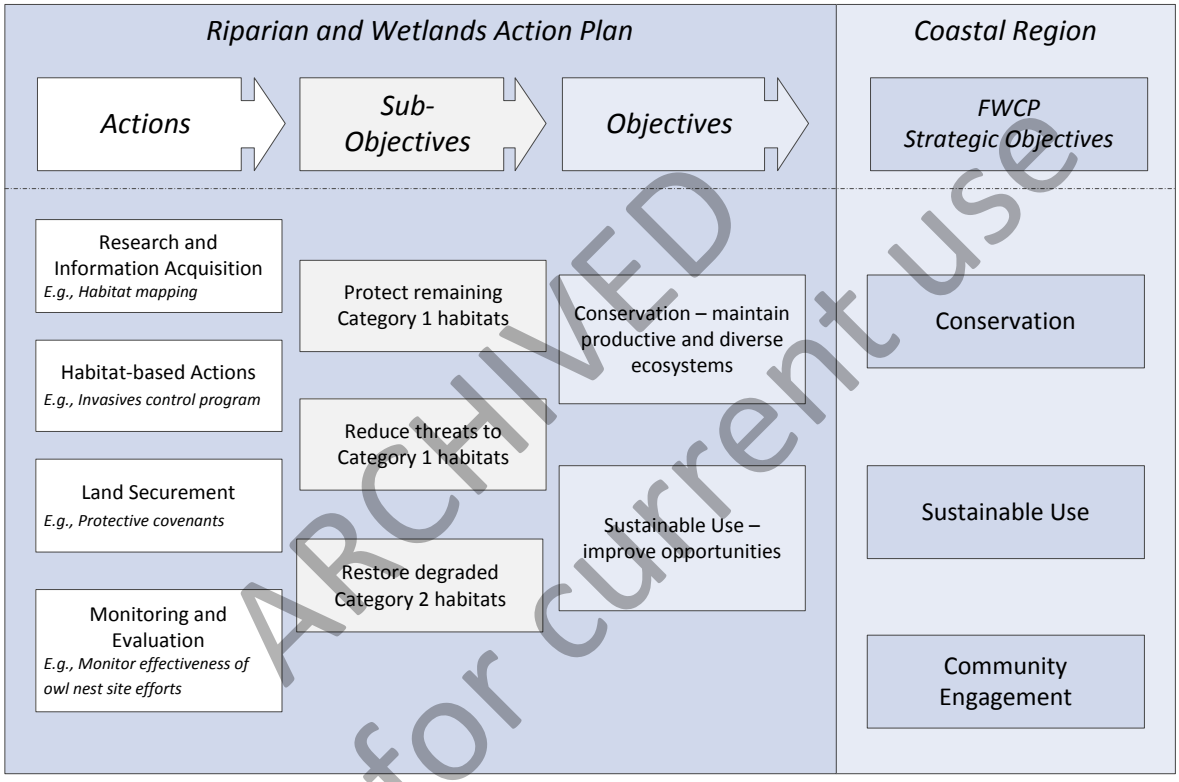

Figure 3: Relationship between actions, sub-objectives and objectives in this Riparian and Wetlands Action Plan and the FWCP strategic objectives.

4.2 COMPONENTS

This section presents the main actions identified for riparian and wetland areas in the Bridge-Seton rivers system along with the supporting rationale for why the action is required and what it will achieve (Table 2 below). Currently, there has not been a significant attempt to gather all existing data, and there is a dearth of information regarding the extent and distribution of the categories of wetlands and riparian areas, as well as the specific species which may utilise them in the Bridge-Seton River watersheds. Consequently, the initial focus of this action plan is solely on collation of existing knowledge, research and information acquisition. At such time as enough information is collected, the action plan should be revisited and

updated with opportunities for habitat-based actions, land securement and monitoring and evaluation. Also provided are priority ratings to guide investment planning efforts. Actions are assigned priorities from 1-3. Note that low priority actions are not included in the table.

Table 1: Actions for wetlands and riparian areas in the Bridge-Seton River Watershed

#	Action	Rationale	Priority
	Research and information acquisition		
1	Conduct mapping to determine abundance, distribution, and category of riparian and wetland habitat,	Riparian and wetland habitat is poorly mapped throughout the basin and developing a habitat map is necessary to establish targets for securement and compensation.	1
2	Identify opportunities to secure category 1 areas in the Bridge-Seton Rivers system.	Once Category 1 areas have been identified, coherent plans need to be made to secure them. Legal status of different lands must be known to determine appropriate actions for protection.	2
3	Identify opportunities to secure off-site category 1 areas.	There may be more cost effective opportunities off-site. This was identified as relatively important in the workshop as wetland and riparian areas are limited in the Bridge-Seton area.	2
4	Determine threats and potential mitigation strategies to improve category 1 areas	There may be potential threats reducing category 1 area productivity	3
5	Identify opportunities for restoration or creation of category 2 areas.	The Bridge-Seton system has been highly regulated and there is likely potential for restoration of degraded areas. One area may be the North-west end of Carpenter lake which is inundated for short periods but benching could provide wetland areas.	2

#	Action	Rationale	Priority
	Habitat-based actions		
6	Implement riparian and wetland restoration projects that are identified as high priorities through inventory, mapping or assessment.	Primary target is Category 2 areas.	2
	Land securement		
	Monitoring and adaptive management		

5. REFERENCES

Atkinson, R. B., J. E. Perry, G. B. Noe, W. L. Daniels, and J. Cairns, Jr. 2010. Primary productivity in 20-year old created wetlands in southwestern Virginia. Wetlands 30:200-210.

BC Hydro. 2003. Consultative Committee Report and draft Water Use Plan submitted to the Comptroller of Water Rights in December 2003. Executive Summary available at: http://www.bchydro.com/etc/medialib/internet/documents/environment/pdf/wup_bridge_river_executive_summary_pdf.Par.0001.File.wup_bridge_river_executive_summary.pdf.

Bridge-Coastal Restoration Program. 2000 Strategic Plan, Volume 2, Watershed Plans, Chapter10: Bridge River and Chapter 11: Seton River. Available at: http://www.bchydro.com/bcrp/about/strategic_plan.html

Bridge Coastal Restoration Program. 2009. Bridge-Seton workshop summary, Lillooet, March 26, 2009. Available at: http://www.bchydro.com/bcrp/about/strategic_plan.html

Failing, L., G. Horn, and P.S.Higgins. 2004 Using expert judgement and stakeholder values to evaluate adaptive management options. Ecology and Society 9(1):13.

Fish and Wildlife Compensation Program. 2011. Bridge-Seton Rivers Watershed Plan. Available at: http://www.bchydro.com/about/our_commitment/compensation_programs.html

Hall, A. 2007. Responnse of riparian cottonwoods to experimental flows along the lower Bridge River, British Columiba. Master of Science, University of Lethbridge, 2004.

MacDonald, A. 2009. Fish & Wildlife Compensation Program: Executive Summary. Report for BC Hydro, Vancouver, BC.

National Research Council. 2001. Compensating for wetland losses under the Clean Water Act. Academic Press, Washington, DC.