FWCP
Fish & Wildlife
COMPENSATION PROGRAM
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BRIDGE-SETON WATERSHED ACTION PLAN

FINAL November 14, 2017
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The Fish & Wildlife Compensation Program is a partnership between BC Hydro, the Province of B.C., Fisheries and Oceans Canada, First Nations and Public Stakeholders to conserve and enhance fish and wildlife impacted by BC Hydro dams.

BC Hydro Power smart
British Columbia
Fisheries and Oceans Canada

The Fish & Wildlife Compensation Program is conserving and enhancing fish and wildlife impacted by construction of BC Hydro dams in this watershed. Top row, from left: La Joie Dam, aerial view of La Joie Dam, and Terzaghi Dam. Bottom row, from left: Bridge River Powerhouse on Seton Lake Reservoir, the Seton Dam, and the Seton Canal to the Seton Powerhouse into the Fraser River (Credit BC Hydro). Cover photos: Western Screech Owl (Credit J. Hobbs), Sockeye Salmon (Credit iStock).

The Fish & Wildlife Compensation Program (FWCP) is a partnership between BC Hydro, the Province of BC, Fisheries and Oceans Canada, First Nations and Public Stakeholders to conserve and enhance fish and wildlife impacted by BC Hydro dams. The FWCP funds projects within its mandate to conserve and enhance fish and wildlife in 14 watersheds that make up its Coastal Region.

Learn more about the Fish & Wildlife Compensation Program, projects underway now, and how you can apply for a grant at fwcp.ca. Subscribe to our free email updates and annual newsletter at www.fwcp.ca/subscribe. Contact us anytime at fwcp@bchydro.com.

EXECUTIVE SUMMARY: BRIDGE-SETON WATERSHEDS

The Fish & Wildlife Compensation Program is a partnership between BC Hydro, the Province of B.C., Fisheries and Oceans Canada, First Nations and Public Stakeholders to conserve and enhance fish and wildlife impacted by BC Hydro dams.

This Action Plan builds on the Fish & Wildlife Compensation Program's (FWCP's) strategic objectives, and is an update to the previous *FWCP Watershed and Action Plans*. The Action Plan was developed with input from BC Hydro, Fisheries and Oceans Canada (DFO), Canadian Wildlife Service (CWS), Ministry of Environment (MOE), Ministry of Forests, Lands and Natural Resource Operations (FLNRO), participating First Nations, and local communities. It specifies actions that will conserve, restore and enhance fish and wildlife species and their habitats.

This Action Plan sets out Priority Actions for the FWCP that will guide funding decisions for FWCP projects in the Bridge-Seton Watersheds. The focus of the next five-year period will be Priority Actions identified for fish, wildlife, and habitats in three broad ecosystems categories**:**

1. Rivers, Lakes & Reservoirs;
2. Wetland & Riparian Areas; and
3. Upland & Dryland.

These ecosystem categories are described in the Ecosystem Chapters, and proposed Priority Actions are in the Action Table at the end of this document. The Priority Actions are intended to support FWCP's strategic objectives of conservation, sustainable use and community engagement. Actions fall into one or more of the following types:

1. **Research and Information Acquisition** – These actions will collect information necessary to evaluate, review and implement subsequent conservation, restoration and enhancement actions. Examples include inventory, limiting factor assessments and other activities to address data gaps and information needs to complete other actions.
2. **Habitat-based Actions** – These actions will conserve, restore, and enhance habitats. Examples include habitat creation, restoration, and enhancement, enhancing habitat connectivity, and invasive species management.
3. **Land Securement** – These actions will contribute to the establishment of easements or covenants or the purchase of private land for conservation purposes.
4. **Species-based Actions** – These actions will alleviate limiting factors for a species. Examples include restoration planning, captive breeding/rearing and reintroduction.
5. **Monitoring and Evaluation** – These actions will monitor and evaluate projects supported by FWCP to understand the effectiveness of habitat- or species-based actions.

This Action Plan, and specifically the Action Table, sets out FWCP priorities for investments in compensation activities within the watershed. However, actions may not translate into funded projects. FWCP funding limitations require priority setting across the Coastal Region's 14 watersheds. The process of selecting which actions will be implemented in any given year will occur during the annual grant intake and project selection cycle. See fwcp.ca for more.

About our Action Plan

This Action Plan provides important background information about the watershed, including hydro development projects by BC Hydro, and conservation and enhancement projects funded by the Fish & Wildlife Compensation Program (FWCP). This Action Plan outlines our Priority Actions for fish and wildlife eligible for an FWCP grant.

Anyone interested in applying for an FWCP grant should review our Priority Actions (see Action Table) and develop a grant application that aligns with a Priority Action(s).

Contact us to discuss our grants, Priority Actions and how we can help you develop your grant application. Subscribe and we will keep you posted about our grants and the projects we fund. Learn more at fwcp.ca

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BRIDGE-SETON WATERSHED BACKGROUND

Introduction

The FWCP Action Plans provide strategic direction for each region based on the unique priorities, compensation opportunities, and commitments in the region, and they reflect FWCP's vision and mission. The Action Plans describe the strategies and Priority Actions to support FWCP objectives. Please refer to the Action Plan Overview for more information on the process that was followed to develop Action Plans. The structure of this Action Plan is shown in Figure 1.

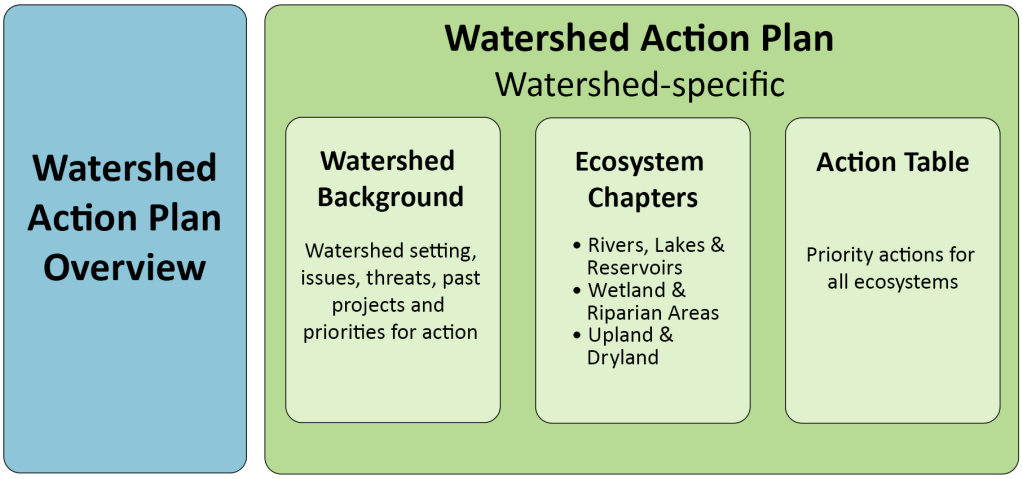

Figure 1: Structure of FWCP Action Plan Overview and Action Plan components.

Setting

The watersheds of the Bridge and Seton rivers are located in the rain shadow of the southern Coast Mountains, about 200 km northeast of Vancouver (Figure 2). The two watersheds are adjacent and separated by the Bendor Range and Mission Ridge. Together, they drain an area of approximately 3700 km^2. Elevations range from 236 m at the confluence with the Fraser River to rugged peaks of about 3000 m. The watersheds are characterized by steep-sided slopes and broad lower valleys. 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.

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 River project consists of La Joie Dam, which impounds the upstream portion of the Bridge River and forms the Downton Lake Reservoir. Releases from La Joie discharge into Middle Bridge River and flow into Carpenter Lake Reservoir. Terzaghi Dam impounds Carpenter Reservoir. Water is diverted through tunnels and penstocks from Carpenter Lake Reservoir to two powerhouses on the shore of Seton Lake.

When Terzaghi Dam was first completed in 1948 no continuous releases from Carpenter Lake 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). Releases from Terzaghi Dam are now provided to maintain riparian and aquatic habitat in Lower Bridge River prior to joining the Fraser River.

Seton Lake is impounded by Seton Dam. Seton Lake receives water from the natural course of Seton River, discharge from the Bridge River Generating Stations, and diversion from Cayoosh Creek. Water is diverted from Seton Lake at Seton Dam along a 3.7 km power canal to a small forebay which supports Seton Generating Station. Seton Generating Station discharges directly into the Fraser River. Non power releases of water from Seton Lake into Seton River are accommodated through release structures at Seton Dam. Seton River joins the Fraser River upstream of the Seton Generating Station and downstream of the confluence of Lower Bridge River. BC Hydro also diverts water from Cayoosh Creek made available at the tailrace of an independent power project, Walden North, into Seton Lake. Inflow from Cayoosh Creek in excess of the operating capacity at Walden North is returned back into Cayoosh Creek and joins Seton River approximately 500 m downstream of Seton Dam. The Seton Dam incorporates fish passage structures, which allow anadromous salmon to ascend beyond the outlet of Seton Lake. The seasonal flow regime of the Bridge River watershed dominates the operation of Seton Lake Reservoir. Please see the Bridge River Power Development Water Use Plan for more information.

Communities in the Bridge-Seton Watersheds have a population of approximately 4500, of which almost 3000 are located near Lillooet. Other communities include Gold Bridge, near the La Joie Dam, and Yalakom on the lower Bridge River. The watersheds are within the traditional territory of the St’át’imc Nation and are of interest to Lil'wat, N’Quatqua, Samahquam, Sekw'el'wás, Skatin, T'it'q'et, Tsalalh, Ts'kw'aylaxw, Xaxli'p, Xa'xtsa, and Xwisten Nations. Duffy Lake Park, Nlhaxten/Cerise Creek Conservancy, and Spruce Lake Protected Area are within the basins. Mineral exploration and development have also occurred in both watersheds, with active mines in the Bridge River watershed. There are extensive forest harvesting and related roads in the watersheds. Both motorized and non-motorized back-country recreation occur throughout the watersheds. Heli-skiing, snowmobiling, mountain biking, hiking, fishing, and hunting are all common recreation activities in the area.

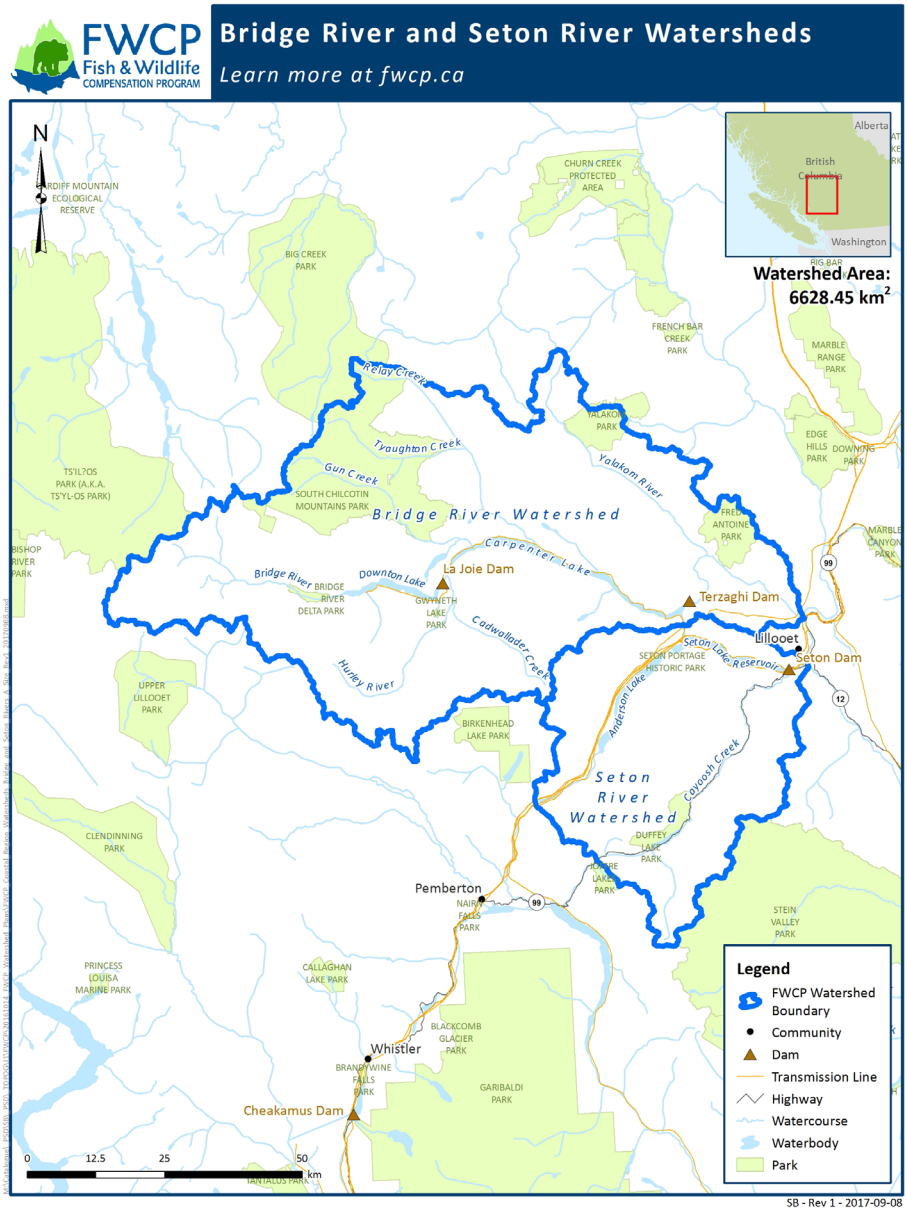

Figure 2: The FWCP's Bridge-Seton Watershed boundary.

Land Ownership in the Bridge – Seton Watersheds

There are numerous landowners in the Bridge -Seton Watersheds. Crown land is extensive but there are First Nation reserves in the lower Bridge River system and through the Seton River Watershed. Development in the corridor between Seton Lake Reservoir and the Fraser River (about 7 km long) is a mix of campgrounds, highway corridor, lumber mills, CN rail yards, a fenced canal, an artificial salmon spawning channel and hydro-electric infrastructure. Proponents need to ensure proposed activities and access requirements do not conflict with local land ownership and, where necessary, provide the status of project/land owner discussions in the proposal.

Footprint Impacts and Threats

Dam construction, hydropower development, and alterations in the hydrologic regime of the system have resulted in considerable changes to habitats and the fish and wildlife populations that rely on them.

Hydro-related Impacts

Inundation: The impoundment of Downton Reservoir flooded 2,234 ha of river and valley bottom, 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 areas, and 237 ha of wetlands. The impoundment of Carpenter Reservoir flooded 4,996 ha of river and valley bottom, 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. The impoundment of Seton Lake Reservoir raised the elevation of the original Seton Lake by about 2 m and flooded 27 ha of land, 0.5 km of mainstem, 3 ha of channels and 3 ha of adjacent riparian areas.

Habitat Loss: Inundation resulted in loss of valley bottom and valley side coniferous, deciduous, wetland and riparian habitats. Associated losses include the loss of marsh and wetland feeding/breeding habitat for birds, bats and furbearers, the loss of feeding habitat for bears and ungulates, and the loss of valley side habitat for bighorn sheep, other ungulates, and carnivores. Construction of La Joie Dam sluiced a large volume of sediment that degraded downstream habitat in the Middle Bridge River. Dredging during the construction of Seton Dam caused a major loss of spawning habitat for Pink Salmon and other species. Dams have stopped the recruitment of gravel and large woody debris downstream which have resulted in decreased spawning and rearing habitat. Periodic spilling scours gravel and degrades downstream habitat, strands or displaces fish in the Lower Seton River and Lower Bridge River. Access roads reduced instream and riparian habitat. Diversion of water from Cayoosh Creek into Seton Lake Reservoir reduces flows downstream of the diversion and may diminish available habitat area, gravel, and large woody debris in the downstream channel. Present flow releases at Seton Dam restrict instream habitat and access to former off-channel habitat. In Seton Lake Reservoir, water chemistry, temperature, water clarity and nutrients have been altered significantly since the diversion of Bridge River water into the system.

Migration Barriers: The Terzaghi Dam created a barrier to salmon migration. Loss of salmon above Terzaghi has had a negative effect on predators and scavengers upstream. Inundation of the main river and tributaries (Carpenter and Downton reservoirs) created a barrier to the movement of large mammals (bears and ungulates).

The Seton canal (4.6 km) is a barrier to terrestrial wildlife movement.

Upstream of Seton Dam, adult Pink Salmon are impinged at the power canal intake structure. Juvenile Sockeye, Coho and Chinook are entrained into the Seton power canal during spring outmigration.

New Habitat: Inundation created open water for waterfowl and osprey. The flooding of shoreline trees created snags for cavity nesting birds. There is more area for lake species. The fish species composition is basically unchanged; however, Kokanee are stocked in Carpenter Reservoir.

Fluctuating Reservoir: Large annual drawdown (as much as 49m) in Downton Reservoir affects access to tributaries and the establishment of aquatic and riparian vegetation. Backwatering and dewatering of tributaries leading to reservoirs increases the risk of egg mortality and restricts access for spawning.

Altered Flow Regime: Prior to 2000, the elimination of flows downstream of Terzaghi Dam reduced the wetted area to off-channel habitats available to juvenile salmon in the Lower Bridge River. Since August 2000, BC Hydro has been implementing flow trials to increase downstream flows and monitoring the effects on fish and wildlife in an adaptive

management program. Results from flow trials indicate that increased flows from Terzaghi Dam help to increased wetted areas and have boosted juvenile salmon productivity relative to pre-trial periods. However, increased flows have also increased late-summer water temperatures in the Lower Bridge River and appear to cause early-emergence of incubating Chinook, possibly reducing recruitment. In 2016 and 2017 modified operations in the Bridge River system resulted in higher than the average annual flows levels. BC Hydro Water Use Plan studies completed additional monitoring to capture the incremental impact of these higher spring-summer flows.

Downstream on the Fraser River, anadromous salmon migrating upstream may experience temperature stress due to loss of historically large volumes of cool Bridge River discharge as they pass Bridge River Rapids.

Diversions: Diversion of water from the Bridge and Cayoosh systems into the Seton system has altered flow regimes and temperature in all systems, as well providing increased sediment into Seton and altering its water chemistry.

Entrainment: Fish entrainment occurs from Downton and Carpenter reservoirs in the Bridge River Watershed. A working group through BC Hydro's Fish Entrainment Strategy (BC Hydro 2006) has determined mitigation to offset entrainment impacts. Studying or mitigating fish entrainment falls to BC Hydro's Fish Entrainment Strategy and is not within the FWCP's scope.

Terrestrial Footprint: Terrestrial impacts have resulted from the footprint of infrastructure associated with the project, including dams, penstocks, powerhouses, roads, and rights-of-way.

Non-hydro Impacts

Other impacts in the Bridge-Seton Watersheds include mining (particularly in the area of Gold Bridge around Ferguson Creek), forestry, rail lines, highways and other roads. Construction of a rail line 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, but significant areas are farmed and/or grazed, particularly in the drier, eastern portion of the watershed.

Objectives for the Bridge-Seton Watersheds

Clear management objectives are needed to guide information gathering and effective prioritizing of management actions. Each Ecosystem Chapter has three objectives, which are high-level statements of desired future conditions (outcomes), consistent with FWCP strategic objectives, partner mandates and policies. Each Ecosystem Chapter also has more detailed sub-objectives, which provide more specific direction on desired future conditions. Actions in the Action Table align with the objectives and sub-objectives, summarized in Table 1.

Table 1: Summary of objectives and sub-objectives in each Ecosystem Chapter.

Objectives	Sub-objectives		
	Rivers, Lakes & Reservoirs	Wetland & Riparian Areas	Upland & Dryland
Ensure a productive and diverse ecosystem	Conserve and restore habitat capacity and diversity for fish and other aquatic organisms.	Protect, enhance and create new wetland and riparian habitat.	Protect and enhance rare and ecologically significant upland/dryland habitat.
Maintain or improve the status of species of interest	Sustain and increase the population viability of: (a) Anadromous salmon (Coho,	Maintain and, where feasible, increase the abundance of species of interest (e.g.,	Maintain and, where feasible, increase the abundance of species of interest (e.g.,

Objectives	Sub-objectives		
	Rivers, Lakes & Reservoirs	**Wetland & Riparian Areas**	**Upland & Dryland**
	Chinook, and Sockeye) and Steelhead; and, (b) Resident salmonids (Kokanee, Rainbow Trout and Bull Trout).	federally listed species-at-risk and species identified through government, community, and First Nations engagement). See Action Table for specific species.	federally listed species-at-risk and species identified through government, community, and First Nations engagement). See Action Table for specific species.
Maintain or improve opportunities for sustainable use	Maintain or improve opportunities for sustainable use, including for food, social, ceremonial, recreational, or commercial purposes.		

FWCP Projects Implemented: Bridge-Seton Watersheds

FWCP has been funding projects in the Bridge-Seton Watersheds since 1999 under the Bridge-Coastal Restoration Program (BCRP) and subsequently under the Fish & Wildlife Compensation Program[1] Coastal Region. A full list of the reports from projects undertaken to date is available online at www.fwcp.ca. Below is a brief summary of the work undertaken under each Ecosystem Chapter during the 2010/2011 to 2015/2016 FWCP project years.

Rivers, Lakes & Reservoirs

Twelve Rivers, Lakes & Reservoirs projects were undertaken in the Bridge-Seton Watersheds during the 2010/2011 to 2015/2016 FWCP project years with $1,015,649 of FWCP funding. Six projects were associated with Research and Information Acquisition and Monitoring and Evaluation actions to assess juvenile and adult salmon populations in Gates Creek, an important salmon-bearing tributary of the Seton-Anderson watershed. One of these was the final year of the Rehabilitation of Gates Creek Sockeye Spawning Channel project, which replaced the spawning channel gravels in 2008 and 2009 to improve egg-to-fry survival of Sockeye, and then enhanced structures for monitoring juveniles and adults in 2010. In 2011, another project evaluated juvenile Coho distribution and habitat use in Gates Creek. These projects were followed by the four-year Gates Creek Salmon Project, which monitored juvenile Sockeye and Coho out-migration for both Gates Creek and the Gates Creek spawning channel. This work has identified the importance of Gates Creek for the production of Sockeye fry, and that the best management practice should ensure use of the creek habitat by Sockeye spawners and optimize loading of the spawning channel.

Five projects were a part of the *Sekw'el'was* Seton River Corridor Conservation and Restoration Project, which first involved a feasibility study, and then a six-year implementation (four phases complete up to 2015/2016). The project includes fisheries and wildlife components and has a goal to create a functioning fish and wildlife corridor from Seton Lake to the Fraser River, while supporting community engagement and training. The fisheries component included maintenance of the Seton spawning channels and assessments of adult spawner abundance and juvenile growth in the Seton River and spawning channels. All work will support the development of the Seton River Corridor Fish and Wildlife Management Plan. The final FWCP-supported project was a land securement action that settled mining rights on Horseshoe Bend, Bridge River.

[1] The Program changed its name in 2011 from the BCRP to the FWCP.

Wetland & Riparian Areas

Seventeen Wetland & Riparian Areas projects were undertaken during the 2010/2011 to 2015/2016 FWCP project years with $921,605 of FWCP funding. Among these, thirteen projects addressed both Riparian/Wetland and Upland/Dryland objectives through Research and Information Acquisition and Habitat Based Actions. Of these, two multi-year projects (a total of ten individual projects) in the Seton area targeted many species at risk and of regional concern (including amphibians and Western Screech-owl) through wildlife inventory surveys and monitoring, habitat mapping, and direct restoration and enhancement activities, including revegetation, installation of wildlife habitat structures, and invasive plant control. Another project targeting both Riparian/Wetland and Upland/Dryland habitat used fungal inoculation to increase the supply of wildlife trees, and proposals were funded for ecosystem services and a natural area conservation plan. Four projects focused only on Riparian/Wetland species and habitats. These included a two-year project that targeted Western Screech-owl through inventory, encouragement of stewardship, and proposals for Wildlife Habitat Areas, a project focused on control of aquatic invasive plants, and one Land Securement project. Although progress has been made on many identified Riparian/Wetland Actions in this watershed, relatively small areas have generally been targeted and additional work could be conducted at additional locations or broader scales. This includes mapping of riparian/wetland habitat and identification of threats, mitigation, restoration, and securement opportunities.

Upland & Dryland

Thirty-nine Upland/Dryland projects were undertaken during the 2010/2011 to 2015/2016 FWCP project years with $2,028,793 of FWCP funding. Among these, thirteen projects addressed both Riparian/Wetland and Upland/Dryland objectives. These included two multi-year projects (ten individual projects) that targeted species at risk and of regional concern in the Seton area through monitoring, habitat mapping, and restoration activities. Focal species were Mule Deer, American Black Bear, bats, small mammals, reptiles, and breeding birds. A project that used fungal inoculation to increase the supply of wildlife trees, and projects that proposed ecosystem services and a natural area conservation plan, also targeted both Riparian/Wetland and Upland/Dryland objectives. The remaining twenty-five projects were focused only on Upland/Dryland species and habitats targeted many high or medium priority species in the watershed. These included two three-year project that conducted inventory and installation of artificial den boxes for Fisher (high priority), a four year project (2011-2014) that investigated habitat use, migration ecology, and survival of Mule Deer (high priority), five projects (two two-year and one single year project) that addressed information acquisition needs for Grizzly Bear (high priority) through habitat mapping and investigation of diet, time-budgets, movement, and habitat selection, three projects (2013-2016) that targeted Whitebark Pine (an important forage species for Grizzly Bear) through restoration and monitoring, one project (2012) that targeted Mountain Goat (medium or high priority) through investigation of mineral lick sites, and one project (first year of a multi-year project) focused on Spotted Owl (high priority) through inventory and proposals to conduct releases of captive-born owls and monitoring. Five projects conducted inventory for Wolverine (two projects: 2014, 2016, with one more year proposed), bats (two projects: 2010, 2014), and Peregrine and Prairie falcons (one project: 2010).

Interactions with Other Ongoing Processes

Water Use Plan (WUP) – BC Hydro undertook Water Use Planning in the Bridge-Seton Watersheds to find a better balance of power and non-power interests (such as fish, wildlife and recreation) when operating the system. The resulting WUP Order directed incremental operational changes and monitoring studies to determine the effectiveness of the operational changes. FWCP partners support and coordinate with the WUP ordered monitoring studies, however FWCP does not fund the monitoring associated with operations.

Fish Passage Decision Framework – Any studies to assess the feasibility of restoring fish passage at existing BC Hydro facilities must adhere to the Fish Passage Decision Framework (BC Hydro 2016) to be funded by the FWCP.

Fish Entrainment Strategy – Fish entrainment issues are addressed through BC Hydro's Fish Entrainment Strategy (BC Hydro 2006). Grant applications to study or mitigate entrainment issues are not eligible for FWCP funding.

ECOSYSTEM CHAPTERS
BRIDGE-SETON WATERSHEDS

ECOSYSTEM CHAPTER: RIVERS, LAKES & RESERVOIRS

Actions for Rivers, Lakes & Reservoirs

The Action Table in this document (see page 24) identifies our Priority Actions to conserve and enhance fish & wildlife in this watershed. Priority Actions are organized by Action type: Research and Information Acquisition, Habitat-based Actions, Species-based Actions, Land Securement and Monitoring and Evaluation. Actions are assigned a priority ranking from 1 (highest priority) to 3 (lowest priority).

Aquatic Habitat in the Bridge-Seton Watersheds

There is little quantitative historical information on salmonid distribution and abundance in the Bridge River, and they are mostly inferred from historical photos and descriptions, current fish presence, and oral history. Anadromous salmon and Steelhead likely accessed the Bridge River as far as La Joie and Zoltique Falls, near the current site of La Joie Dam. The lower Bridge was dominated by high velocity canyon habitat and much of the spawning and rearing occurred in the middle Bridge and its tributaries. There were substantial runs of species with strong swimming ability, like Chinook, Coho, Steelhead and to a lesser extent Sockeye Salmon. Following construction of Terzaghi Dam and the cessation of flows, the lower Bridge River became more hospitable as rearing and spawning habitat resulting in Pink Salmon use of this area. Resident salmonids recorded in the Bridge system include Bull Trout, Rainbow Trout and Mountain Whitefish, as are non-salmonids like lamprey, sculpin and sucker.

Anadromous runs of Sockeye, Pink, Chinook and Coho salmon and Steelhead had access to the Seton system. Both Seton and Anderson lakes are sockeye nursery lakes and historically the system as a whole supported substantial runs of returning Sockeye Salmon. The runs were affected by massive harvest in the lower Fraser, which peaked in the 1890s. Seton and Anderson lakes historically supported abundant Kokanee, known as 'gwenis' by local First Nations. These fish spawned on the shore or shoal areas of the lakes. Spawning habitats for all salmonids occur in the Gates, Portage and lower Seton rivers, and a variety of tributaries. Gates Creek is one of the most important salmon bearing streams of the Seton-Anderson watershed and supports a key population of Sockeye Salmon and smaller populations of Coho and Pink Salmon. In 1968, a Sockeye specific spawning channel was constructed by the International Pacific Salmon Fisheries Commission in Gates Creek, 800 m upstream of Anderson Lake to enhance Sockeye escapement.

Bridge River and Seton River fish stocks were substantially affected by two large slides in 1913 and 1914 at Hells Gate in the Fraser Canyon, which created a barrier to upstream fish migration. Fishways built in 1945 and extended in 1956 helped improve fish passage to the watersheds, but stocks took many years to rebuild. The effects of the Hells Gate slides are thought to have contributed to underestimating the productivity of Bridge-Seton fish stocks during evaluation of hydro-development in the watersheds.

Limiting Factors

Limiting factors vary among species and need to be further assessed. They are expected to include:

- **Habitat area**: Former spawning, rearing and overwintering areas are permanently lost or seasonally reduced by dam footprint, reservoir drawdown and flooding, diversions, or dam and generating station operations; or from non-hydro sources. Disturbance and loss of riparian habitats in the lower Seton River and Cayoosh Creek is thought to play a role in limiting some species.
- **Habitat quality**: Physical habitat below dams is altered by reduced recruitment of gravel and large woody debris. Reduced gravel recruitment in the lower Bridge River is a concern, especially for Chinook Salmon.

- **Access**: Dams block access to formerly useable habitat, and altered flow regimes affect passage conditions in some locations. Fish passage at Seton Dam is restricted for some species.
- **Diversions**: The Bridge diversion has reduced annual flow downstream of Terzaghi Dam, and increased volumes in the receiving waterbodies. Altered flows have affected wetted area, seasonal temperatures and stream and lake productivity.
- **Entrainment**: Fish entrainment occurs from Downton and Carpenter reservoirs in the Bridge River Watershed. There are no known conservation concerns related to entrainment from Seton Lake Reservoir.

Knowledge Status

Habitat

A detailed account of habitat impacts from hydropower development is provided in BCRP (2000) and is summarized on page 9. In addition to present and historic hydropower impacts there are diverse impacts in the watershed from forestry, mining and rail development.

Changes in operations agreed to by BC Hydro as a part the Water Use Plan (BC Hydro 2003) have improved habitat conditions in the watersheds (Hall 2007). FWCP (and BCRP) habitat compensation projects have been conducted in the watershed since 1999 and have had a positive influence on habitat throughout many locations in the Bridge-Seton system. The low level outlet gates at Terzaghi Dam were modified to allow flow releases to the lower Bridge River. Continuous flow trials began in 2000, with BC Hydro implementing an annual average of 3 m^3/s. This first trial continued until March 2011 and was followed by a second trial, starting in April 2011 with of annual average releases of 6 m^3/s. In 2016 and 2017 modified operations in the Bridge River system resulted in higher than the average annual flows levels. BC Hydro Water Use Plan studies completed additional monitoring to capture the incremental impact of these higher spring-summer flows. Prior to the flow release, FWCP partners and St'at'imc collaborated to rebuild habitat for Coho, Chinook, Steelhead, Bull Trout and Rainbow Trout in the upper 2.2 km of the river. These efforts re-watered 48,000 m^2 of stream channel, created 20,000 m^2 of in-channel habitat of which 16,000 m^2 is spawning habitat, created 5,000 m^2 of off-channel habitat, and included 7,000 m^2 of riparian planting. Spawning salmon were observed in the channel soon after the initial flow release.

Habitat in the Seton River system has been enhanced over the last decade. Work conducted by the FWCP includes complexing of 26,500 m^2 of Seton spawning channels, and opening them up to all fish species, whereas previously the channels had been used primarily for odd-year Pink Salmon. FWCP has also recently supported the *Sekw'el'was* Seton River Corridor Conservation and Restoration Project, which is supporting development of the Seton River Corridor Fish and Wildlife Management Plan. The project includes both fisheries and wildlife components and has a goal to create a functioning fish and wildlife corridor from Seton Lake to the Fraser River. Additional habitat works include Seton River foreshore restoration, Gates Creek spawning channel gravel replacements, and purchase of Gates Creek properties for conservation and enhancement.

Gates Creek has been negatively affected by linear developments including transmission corridors, roads and railways and logging activity. Spawning channel weirs and rural development in the lower reach have altered stream morphology and this is believed to have impacted both Bull Trout and Rainbow Trout production. However, MOE has stated that Darcy Creek and other smaller tributaries have some restoration opportunities. Gates Creek has areas of important groundwater influence.

Knowledge Gaps

The following knowledge gaps have been highlighted by agencies, First Nations, and stakeholders:

- To help set priorities for restoration, the program needs a better understanding of limiting factors that can be addressed by restoration initiatives
- Understanding the effects of previous restoration efforts and a need to develop detailed restoration plans to achieve long-term salmon conservation objectives
- Key spawning locations of Kokanee in Seton Lake and feasibility of restoration opportunities for Kokanee
- Current habitat use, distribution and restoration opportunities for Bull Trout
- Success of previous habitat-based actions undertaken by FWCP and partners

Objectives and Measures

The following objectives have been developed to define the scope of the Rivers, Lakes & Reservoirs Ecosystem Chapter. While the objectives are expected to remain stable over time, the projects funded may evolve as management priorities shift, or new information becomes available.

Objective 1: Ensure a productive and diverse aquatic ecosystem.
This objective addresses overall ecosystem integrity and productivity and directs compensation activities to develop productive, useable aquatic habitats. Where cost-effective opportunities exist, compensation works will be aimed at aiding multiple aquatic species to conserve and restore habitat capacity and diversity for fish and other aquatic organisms.
Measures — Measures will be ecosystem- and project-specific.

Objective 2: Maintain or improve the status of species of interest
This objective is supported by two sub-objectives:

1. **Sustain and increase the population viability of anadromous salmon and steelhead**
   Measures – Measures will be species- and project-specific.

2. **Sustain and increase the population viability of resident salmonids.**
   Measures – Measures will be species- and project-specific.

Objective 3: Maintain or improve opportunities for sustainable use.
This objective reflects the important sustainable use benefits that can be derived from healthy fish populations. Many salmonid species are the focus of First Nations, commercial and recreational fisheries. Consequently, any actions aimed at achieving the above objective also support this sustainable use objective.
Measures — There are no specific measures required at this time, aside from those associated with Objective 1 and 2.

ECOSYSTEM CHAPTER: WETLAND & RIPARIAN AREAS

Actions for Wetland and Riparian Areas

The Action Table in this document (see page 24) identifies our Priority Actions to conserve and enhance fish & wildlife in this watershed. Priority Actions are organized by Action type: Research and Information Acquisition, Habitat-based Actions, Species-based Actions, Land Securement and Monitoring and Evaluation. Actions are assigned a priority ranking from 1 (highest priority) to 3 (lowest priority).

Wetland and Riparian Areas in the Bridge-Seton Watersheds

Wetland and riparian areas are the most diverse and biologically rich terrestrial ecosystems in BC and are considered highly valuable from an ecological standpoint. Riparian areas are the areas bordering on streams, lakes, and wetlands that link water to land. The blend of streambed, water, trees, shrubs and grasses directly influences and provides habitat for fish and wildlife. The abundance, distribution and condition of wetland and riparian habitats may be limiting factors for many species, especially amphibians, which depend upon them either for the majority of their lifecycles or for key periods such as breeding. Riparian and wetland habitats are often critical in terms of maintaining function and structure for natural systems, including helping to support trophic level functioning and genetic diversity, as well as providing key ecological services such as erosion control, flood control, assimilation of nutrients and water purification. Furthermore, many wetland and riparian species are the focus of sustainable use activities by First Nations and non-First Nations people. Riparian and wetland areas are commonly inundated by impoundments or adversely affected by changes in hydrological regimes that result from water management for power generation. Loss and alteration can significantly affect the services provided by these ecosystems.

The FWCP uses three general categories of riparian and wetland areas for setting objectives (Table 2). These categories define a general level of ecosystem functioning and require different management actions to maintain and improve their condition.

Table 2: Categories of riparian and wetland habitats used by the FWCP.

Category	Description
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.
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.

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. Limiting factors need to be further assessed and are expected to include:

- **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.
- **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 compared 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). Wetlands and riparian ecosystems require dynamic water regimes to maintain their productivity, but managed systems can result in unnatural cycles of stability and de-watering that can impair function or result in succession to different habitat types (e.g., forest, mudflats).
    - 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, basking sites to turtles.
    - Poorly understood factors limit the productivity of created wetlands. These are generally thought to be related to unnatural hydrologic regimes and soil conditions (e.g., Atkinson et al. 2010).

Knowledge Status

Habitat

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. A detailed study of the Seton River corridor was completed in 2016 (Splitrock Environmental Sekw'el'was LP 2016).

Significant marsh and grasslands occur at 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 by 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 cottonwood, mountain alder, Sitka willow and aspen are common riparian species. Flow releases from Terzaghi dam of 3 and 6 m^2/s have resulted in significant growth of juvenile black cottonwoods and have resulted in the establishment of cottonwood saplings (Hall 2007).Spill releases from Terzaghi dam in 2016 and 2017 may have had impacts on the cottonwoods.

Habitat mapping, restoration planning, riparian restoration and subsequent monitoring has occurred in the Seton River Corridor. Riparian restoration has included controlling invasive species (including aquatic species), habitat complexing, revegetation, corridor creation, and installations of nest boxes for Western Screech-owls.

Knowledge Gaps

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

Objectives and Measures

The following objectives have been developed to define the scope of the Wetland & Riparian Areas Ecosystem Chapter. While the objectives are expected to remain stable over time, the projects funded may evolve as management priorities shift, or as new information becomes available.

Objective 1: Ensure productive and diverse wetland and riparian ecosystems.
This objective addresses overall ecosystem integrity and directs compensation activities to maintain ecosystem productivity by protecting, enhancing or creating new wetland and riparian habitat.

This objective is supported by three sub-objectives:

1. **Secure remaining Category 1 riparian and wetland habitat.**
   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.
   Measures — Measures will be ecosystem- and project-specific.

2. **Reduce threats to Category 1 riparian and wetland habitat.**
   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.).
   Measures — Measures will be ecosystem- and project-specific.

3. **Restore degraded or create new riparian and wetland habitat (Category 2).**
   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 — Measures will be ecosystem- and project-specific.

Objective 2: Maintain or improve the status of species of interest.
Actions under this objective focus on addressing limiting factors that are not otherwise addressed by general improvements to ecosystem function under Objective 1. The intent is to maintain, or where feasible, increase the abundance of species of interest (e.g., federally listed species-at-risk or species identified through government, industry, public and First Nations engagement).
Measures — Measures will be species- and project-specific.

Objective 3: Maintain or improve opportunities for sustainable use.
Many wetland and riparian species are the focus of sustainable use activities by First Nations and non-First Nations people (e.g., duck hunting, medicinal plants, wildlife viewing). Actions addressing Objectives 1 and 2 will often support this sustainable use objective.
Measures — Measures will be species- and project-specific.

ECOSYSTEM CHAPTER: UPLAND & DRYLAND

Actions for Upland and Dryland

The Action Table in this document (see page 24) identifies our Priority Actions to conserve and enhance fish & wildlife in this watershed. Priority Actions are organized by Action type: Research and Information Acquisition, Habitat-based Actions, Species-based Actions, Land Securement and Monitoring and Evaluation. Actions are assigned a priority ranking from 1 (highest priority) to 3 (lowest priority).

Upland and Dryland in the Bridge-Seton Watersheds

Upland and dryland habitats are those that occur above areas of permanent inundation or periodic flooding. They are usually the habitats least affected by hydroelectric generating infrastructure or operation; however, footprint impacts have occurred and they contribute to the cumulative effects of human-related activities in these habitats. Upland/dryland habitats are diverse and can range from unvegetated areas to grasslands, forests and alpine ecosystems. Different habitats are associated with distinct species assemblages that react to direct or indirect stressors in their distinct habitat niches.

The Bridge-Seton Watersheds are large and ecologically diverse, with a climate dominated by coastal influences in the west but transitioning to a drier, more continental climate in the east. Low elevations are dominated by the western-most occurrence of Interior Douglas-fir (IDF) and Ponderosa Pine (PP) biogeoclimatic zones. Higher elevations transition from Montane Spruce (MS) to Engelmann Spruce Subalpine Fir (ESSF), and finally into high elevation alpine ecosystems with permanent snowfields and glaciers (Green and Klinka 1994).

Limiting Factors

Limiting factors vary among species and need to be further assessed. They are generally associated with:

- **Habitat loss and alteration:** The cumulative effects of forestry and hydro-electric development have resulted in substantial losses and alterations to habitat.
- **Habitat connectivity**: Hydro-electric development (e.g., creation of a fenced canal) and road and railway development have resulted in lost connectivity between habitats, which alters wildlife movements.

Knowledge Status

Habitat

Hydro-electric development and forest harvesting in the Bridge-Seton watersheds have substantially altered upland and dryland habitats. Habitat and vegetation mapping has been completed for some areas, extensive habitat restoration efforts have been undertaken (including planting of Whitebark Pine) and some habitat enhancements for wildlife (i.e., Fisher den boxes, reptile hibernacula) have taken place.

Knowledge Gaps

Past investments in the Bridge-Seton Watersheds have led to gains in knowledge of presence, distribution and habitat availability for various wildlife species in upland and dryland habitats. Projects have focused on Grizzly Bears, Wolverine, Fishers, Mule Deer, Mountain Goats, bats, Harlequin Ducks, Flammulated Owls, Spotted Owls and reptiles as well as for Whitebark Pine. Knowledge gaps to be addressed include: monitoring previous mitigation efforts, inventory of additional species of interest, as well as addressing knowledge gaps identified in management plans and recovery strategies of Species At Risk known to be present in the watershed.

Objectives and Measures

The following objectives have been developed to define the scope of the Upland & Dryland Ecosystem Chapter. While the objectives are expected to remain stable over time, the projects funded may evolve as management priorities shift, or as new information becomes available.

Objective 1: Ensure productive and diverse upland and dryland ecosystems.
Actions under this objective are aimed at protecting/enhancing rare or ecologically significant features.
Measures — Measures will be ecosystem- and project-specific.

Objective 2: Maintain or improve the status of species of interest.
Actions under this objective focus on addressing limiting factors that are not otherwise addressed by general improvements to ecosystem function under Objective 1. The intent is to maintain, or where feasible, increase the abundance of species of interest (e.g., federally listed species-at-risk or species identified through government and First Nations engagement).
Measures — Measures will be species- and project-specific.

Objective 3: Maintain or improve opportunities for sustainable use.
Upland and dryland habitats and associated species are also a focus of sustainable use activities by First Nations and non-First Nations people (e.g., hunting, medicinal plant collection, wildlife viewing). Actions addressing Objectives 1 and 2 will often support this sustainable use objective.
Measures — Measures will be species- and project-specific.

ACTION TABLE

This Action Table identifies the FWCP's Priority Actions to conserve and enhance fish and wildlife impacted by BC Hydro dams in this watershed. Actions identified as OPEN (see Delivery Approach column) are eligible for a grant. When completing your online grant application, you will be required to identify a Priority Action(s) that best aligns with your project idea. A high-quality grant application will clearly demonstrate alignment with Priority Action(s) in an Action Table.

BRIDGE-SETON WATERSHED ACTION TABLE									Version: 21July2020
Action #	**Ecosystem Chapter**	**Action Type**	**Priority Action Short Description**	**Priority**	**Target Species**	**Priority Action**	**Intended Outcome**	**Delivery Approach**	**Location**
1	All	Research & Information Acquisition	**BRG.ALL.RI.01.01 Continue to update habitat assessment map for priority fish & wildlife species-P1**	**1**	Fish & Wildlife	Continue to **update habitat assessment map** for priority fish & wildlife species in the Bridge/Seton watershed. Habitats to be assessed & mapped include: • Wetlands • Riparian Areas • Stream Habitats • Connectivity Corridors • Forested Ecosystems (e.g., seral stage distribution) • Over-wintering habitat for species that utilize talus or rock features (e.g., bats, snakes) • Culturally Important Areas Mapping is to include as much on-the-ground information as possible relevant to the subject fish & wildlife species. The assessment should focus on practical conservation and restoration opportunities. For fish, this work should inform development of habitat restoration and protection plans for priority species and habitats. Consideration should be given to potential impacts from available climate change predictions relevant to the specific habitats (i.e., potential changes to vegetation communities, precipitation, wetland hydro-periods, snowpack, wildfire risk, wildlife movements, etc.). A lack of connectivity corridors has also been raised as an issue by stakeholders. Recommendations should be made through this work for future management actions and assessments.	Improved strategic planning for conservation and restoration opportunities.	Directed	Throughout

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Action #	**Ecosystem Chapter**	**Action Type**	**Priority Action Short Description**	**Priority**	**Target Species**	**Priority Action**	**Intended Outcome**	**Delivery Approach**	**Location**
2	All	Research & Information Acquisition	**BRG.ALL.RI.02.01 Conduct a limiting factors analysis... - Upper Bridge Riv & Downton Res. upstream of La Joie Dam-P3,**	**3**	Fish & Wildlife	Conduct a **limiting factors analysis** for priority fish and/or wildlife in the Bridge/Seton watersheds or sub-basins to support prioritization of future projects. This will include an assessment of population status, habitat status or habitat capacity and/or a cost-benefit analysis of any habitat-based actions proposed by the program, and should be considerate of the root causes of degraded habitats and limitations to productive potential. For fish, sub-basins for assessment include the Upper Bridge River and Downton Reservoir upstream of La Joie Dam (Priority 3), the Middle Bridge River and Carpenter Reservoir upstream of Terzaghi Dam (Priority 2), the Lower Bridge River and Yalakom River (Priority 1), Anderson Lake and tributaries including Gates Creek (Priority 1), the Seton Reservoir and Seton Portage upstream of Seton Dam but below Anderson Lake (Priority 1), the Lower Seton River downstream of Seton Dam (Priority 1), and Cayoosh Creek (Priority 2). Analyses should build upon previous and ongoing assessments, including the Water Use Plan studies and any existing restoration plans, in association with local agency, First Nation and BC Hydro staff, private landowners and other land managers. *Please note that the FWCP may develop templates for this work. Please check with FWCP to see if these templates are available.	To determine cost-benefit of potential FWCP actions and support prioritization of future projects. Leads to the creation of robust habitat or species-based restoration plans for the watershed or sub-basins.	Directed	Throughout
			BRG.ALL.RI.02.02 Conduct a limiting factors analysis... - Middle Bridge Riv &Carpenter Res. upstream of Terzaghi Dam-P2	**2**					
			BRG.ALL.RI.02.03 Conduct a limiting factors analysis... - Lower Bridge River & Yalakom River-P1	**1**					
			BRG.ALL.RI.02.04 Conduct a limiting factors analysis... - Anderson Lake &tributaries incl. Gates Creek-P1	**1**					
			BRG.ALL.RI.02.05 Conduct a limiting factors analysis... - Seton Res.&Seton Portage upstream of Seton Dam but below Anderson Lk–P1	**1**					

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Action #	**Ecosystem Chapter**	**Action Type**	**Priority Action Short Description**	**Priority**	**Target Species**	**Priority Action**	**Intended Outcome**	**Delivery Approach**	**Location**
2 cont.			**BRG.ALL.RI.02.06 Conduct a limiting factors analysis... - Lower Seton River downstream of Seton Dam-P1**	**1**					
			BRG.ALL.RI.02.07 Conduct a limiting factors analysis... - Cayoosh Creek-P2	**2**					
			BRG.ALL.RI.02.08 Conduct a limiting factors analysis... - Bridge/Seton Watershed-P3	**3**					
3	All	Research & Information Acquisition	**BRG.ALL.RI.03.01 Develop a comprehensive restoration&protection plan-Upper Bridge Riv & Downton Res. upstream of La Joie Dam-P3**	**3**	Fish & Wildlife	**Develop a comprehensive restoration and protection plan** for fish and/or wildlife species in the Bridge-Seton watersheds or sub-basins in relation to limiting factors analyses and assessment of population status/habitat capacity. Restoration refers to habitat or species-based actions that restore habitat capacity or population viability, while protection includes habitat-based actions or land securement that protect important habitat from further degradation. Plans must include: • Baseline description of the watershed (hydrology, climate, topography); • Priorities of local First Nations for conservation and restoration; • Previous assessment and restoration works; • Distribution, timing, biological and critical habitat requirements and status of species in the watershed; • Clear goals and objectives based on a desired future condition; • Summary of habitat indicators and limiting factors (based on analyses of habitat pressure indicators, habitat state indicators,	To determine high priority, cost-effective habitat and/or species-based actions that can be supported by the FWCP.	Directed	Throughout
			BRG.ALL.RI.03.02 Develop a comprehensive restoration&protection plan-Middle Bridge Riv &Carpenter Res. upstream of Terzaghi Dam-P2	**2**					

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Action #	**Ecosystem Chapter**	**Action Type**	**Priority Action Short Description**	**Priority**	**Target Species**	**Priority Action**	**Intended Outcome**	**Delivery Approach**	**Location**
3 cont.			**BRG.ALL.RI.03.03 Develop a comprehensive restoration&protection plan-Lower Bridge River & Yalakom River-P1**	**1**		limiting factors analysis); • Knowledge gaps and recommended research and/or assessment priorities; • Restoration priorities with rationale/discussion; • Selected indicators and performance standards for effectiveness monitoring program; and, • Monitoring protocol and schedule. Plans may be multi-species and habitat-based or they may be focused on individual high priority species in the watershed. High priority fish species include Chinook, Coho and Sockeye Salmon, Kokanee, Steelhead, Bull Trout and WHite Sturgeon. High priority wildlife include bats, amphibians, and riparian-associated mammals and birds, as well as Category 1 wetland and riparian areas. Plans should be developed in association with local agency, First Nation and BC Hydro staff, landowners and other land managers. Sub-basins for fish plans include the Upper Bridge River and Downton Reservoir upstream of La Joie Dam (Priority 3), the Middle Bridge River and Carpenter Reservoir upstream of Terzaghi Dam (Priority 2), the Lower Bridge River and Yalakom River (Priority 1), Anderson Lake and tributaries including Gates Creek (Priority 1), the Seton Reservoir and Seton Portage upstream of Seton Dam but below Anderson Lake (Priority 1), and Cayoosh Creek (Priority 2). Restoration plans are best developed as 'living documents' so that they can be updated over time. A number of Priority Actions have been developed already and are described in this Action Table, but further development of restoration actions would be beneficial.			
			BRG.ALL.RI.03.04 Develop a comprehensive restoration&protection plan-Anderson Lake &tributaries incl. Gates Creek-P1	**1**					
			BRG.ALL.RI.03.05 Develop a comprehensive restoration&protection plan-Seton Res.&Seton Portage upstream of Seton Dam but below Anderson Lk–P1	**1**					
			BRG.ALL.RI.03.06 Develop a comprehensive restoration and protection plan-Cayoosh Creek-P2	**2**					

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Action #	**Ecosystem Chapter**	**Action Type**	**Priority Action Short Description**	**Priority**	**Target Species**	**Priority Action**	**Intended Outcome**	**Delivery Approach**	**Location**
3 cont.			**BRG.ALL.RI.03.07 Develop a comprehensive restoration and protection plan-Bridge/Seton Watershed-P3**	**3**		The Lower Seton River (Priority 1) has a restoration plan for fish and wildlife that is underway via the Seton River Corridor Conservation and Restoration Project (16.W.SON.01). For fish, work in the Lower Bridge and Yalakom rivers should build upon the Bridge River Fish Habitat Restoration Project (03.Br.01) and the Water Use Plan Monitoring. Work in Gates Creek for fish should build upon the Gates Creek Juvenile and Adult Salmonid Assessment (16.SON.01) and the Gates Creek Level 2 Fish Habitat Survey (COA-F18-F-2438). *Please note that the FWCP may develop templates for this work. Please check with FWCP to see if these templates are available.			
4	All	Habitat-based Actions	**BRG.ALL.HB.04.01 Implement high priority habitat-based actions for fish and/or wildlife-P1**	**1**	Fish & Wildlife	**Implement high priority habitat and/or species-based actions for fish and/or wildlife** as recommended by mapping activities **(Action 1)**, inventory **(Action 22)**, or by the restoration and protection plan **(Action 3**), or other similar plans already developed in the watershed. Note that a number of priority habitat and/or species-based actions have been developed already and are described in this Action Table, but further development of restoration actions would be beneficial.	Implement high priority, cost-effective habitat and/or species-based actions that can be supported by the FWCP.	Open	Throughout
		Species-based Actions	**BRG.ALL.SB.04.02 Implement high priority species-based actions for fish and/or wildlife-P1**	**1**	Fish & Wildlife				
5	All	Land Securement	**BRG.ALL.LS.05.01 Conduct an options assessment for land securement-P2**	**2**	Fish & Wildlife	Considering ecosystem, conservation, and/or local management objectives, **conduct an options assessment for land securement** that establishes priority areas to be protected through land securement and identifies feasible mechanisms (e.g., fee-simple purchase, covenants, WHAs, etc.). Any work should build upon the Natural Area Conservation Plan (NACP) "Fraser West" developed by the Nature Conservancy of Canada.	Prioritize locations and secure partnerships for land securement.	Open	Throughout

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Action #	**Ecosystem Chapter**	**Action Type**	**Priority Action Short Description**	**Priority**	**Target Species**	**Priority Action**	**Intended Outcome**	**Delivery Approach**	**Location**
6	All	Land Securement	**BRG.ALL.LS.06.01 Land securement-P1**	**1**	Fish & Wildlife	**Land securement** in association with partner organizations to address fish and wildlife management objectives or to support habitat-based actions proposed by the FWCP. Proposals should refer to the Natural Area Conservation Plan (NACP) "Fraser West" developed by the Nature Conservancy of Canada for direction regarding priority biodiversity conservation targets. Land securement could address ecosystem function objectives across the watershed plan chapters of Rivers, Lakes & Reservoirs, Riparian/Wetland, and Upland/Dryland. Priority habitats include alpine, dry forest, grasslands, Grizzly Bear core habitat and movement corridors, mesic forests, water bodies (rivers, streams, creeks and lakes), wetlands, and Whitebark Pine. Private lands have been prioritized in the NACP based on biodiversity conservation target considerations and landscape considerations such as private land size, valley bottom/flatness, proximity to conservation land, presence of species at risk and dry BEC zone weighting.	Conserve, protect and restore ecosystem function and resilience through land securement.	Open	Throughout
7	All	Monitoring & Evaluation	**BRG.ALL.ME.07.01 Develop and implement an integrated monitoring plan for fish and/or wildlif-P1**	**1**	Fish & Wildlife	**Develop and implement an integrated monitoring plan for fish and/or wildlife** in the Bridge-Seton watersheds or sub-basins in relation to existing agency monitoring programs, limiting factors analyses (**Action 2**), restoration plans **(Action 3)** and/or habitat or species-based actions supported by the FWCP. Monitoring should inform limiting factors analyses and/or habitat restoration and should be compatible with existing programs.	Support prioritization of monitoring associated with actions to sustain and restore habitat capacity and population viability of fish & wildlife.	Open	Throughout
8	All	Monitoring & Evaluation	**BRG.ALL.ME.08.01 Assess success of habitat-based actions supported by FWCP-P1**	**1**	Fish & Wildlife	**Assess success of habitat-based actions supported by the FWCP**. Success could be assessed through monitoring of biological and/or physical habitat responses. Success could be assessed on a graduated schedule such as every 1, 3, 5 and 10 years or based on high flow events or other natural or human-caused disturbances.	Assess success of habitat-based actions and support future planning and prioritization.	Open	Throughout

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Action #	**Ecosystem Chapter**	**Action Type**	**Priority Action Short Description**	**Priority**	**Target Species**	**Priority Action**	**Intended Outcome**	**Delivery Approach**	**Location**
9	All	Monitoring & Evaluation	**BRG.ALL.ME.09.01 Conduct condition assessments and/or maintenance on habitat enhancements-P1**	**1**	Fish & Wildlife	**Conduct condition assessments and/or maintenance on habitat enhancements supported by the FWCP**. This could include the development of an inspection and maintenance schedule if required. If part of a multi-year study, provide information about future objectives and actions.	Maintain functioning of habitat enhancements supported by the FWCP.	Open	Throughout
10	Rivers, Lakes & Reservoirs	Research & Information Acquisition	**BRG.RLR.RI.10.01 Conduct an assessment of...spawning platforms for Chinook Salmon downstream of Terzaghi Dam-P1**	**1**	Anadromous & Resident Salmonids	**Conduct an assessment of condition and functioning of spawning platforms for Chinook Salmon downstream of Terzaghi Dam**. Work must be complimentary to Water Use Plan monitoring and the high flow monitoring by Embark Engineering and Coldstream Ecology Ltd/Bridge River Indian Band downstream of Terzaghi Dam.	Develop options to sustain or increase spawning habitat in the Lower Bridge.	Open	Lower Bridge
11	Rivers, Lakes & Reservoirs	Research & Information Acquisition	**BRG.RLR.RI.11.01 Assess the use of Seton spawning channels by all species-P1**	**1**	Anadromous & Resident Salmonids	**Assess the use of Seton spawning channels by all species.** Work should build upon that conducted in recent years through the Seton River Corridor Conservation and Restoration Project and could include an assessment of Lower Seton spawning channel and Cayoosh Creek use during high flows in the mainstem. Any assessment/inventory should meet the criteria outlined in **Action 22**.	Support prioritization of habitat-based actions in Seton spawning channels.	Open	Lower Seton and Cayoosh Creek
12	Rivers, Lakes & Reservoirs	Research & Information Acquisition	**BRG.RLR.RI.12.01 Assess current habitat use, distribution and restoration opportunities for Bull Trout-P1**	**1**	Bull Trout	**Assess current habitat use, distribution and restoration opportunities for Bull Trout** (e.g., in the Yalakom and Portage rivers, and Spyder and Whitecap creeks.). Any assessment/inventory should meet the criteria outlined in **Action 22**.	Support prioritization of further actions related to Bull Trout.	Open	Seton-Portage and other
13	Rivers, Lakes & Reservoirs	Research & Information Acquisition	**BRG.RLR.RI.13.01 Assess the feasibility for creation of off-channel or side channel habitat-P1**	**1**	Anadromous & Resident Salmonids	**Assess the feasibility for creation of off-channel or side channel habitat** in the Lower Bridge River, Portage Creek, Gates Creek, and Upper Seton River to benefit multiple species.	Develop options to increase spawning and rearing habitat.	Open	Lower Bridge

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Action #	**Ecosystem Chapter**	**Action Type**	**Priority Action Short Description**	**Priority**	**Target Species**	**Priority Action**	**Intended Outcome**	**Delivery Approach**	**Location**
14	Rivers, Lakes & Reservoirs	Research & Information Acquisition	**BRG.RLR.RI.14.01 Assess opportunities to enhance spawning gravel availability-P2**	**2**	Anadromous & Resident Salmonids	**Assess opportunities to enhance spawning gravel availability** for Steelhead, Chinook, Coho and other species in the Seton mainstem.	Develop options to increase spawning habitat in the Lower Seton.	Open	Lower Seton
15	Rivers, Lakes & Reservoirs	Research & Information Acquisition	**BRG.RLR.RI.15.01 Conduct inventory & feasibility asssessment for restoration of Kokanee lake spawning habitats-P1**	**1**	Kokanee Salmon	**Conduct inventory and feasibility asssessment for restoration of Kokanee (gwenis) lake spawning habitats** in Seton Lake and Anderson Lake. Work should inform cost-benefit assessment of potential habitat-based actions for Kokanee. Any assessment/inventory should meet the criteria outlined in action 22.	Support prioritization of further actions related to Kokanee.	Open	Seton Lake and Anderson Lake
16	Rivers, Lakes & Reservoirs	Habitat-based Actions	**BRG.RLR.RI.16.01 Access feasibility of restoration at Apple Springs on the Lower Bridge River-P2**	**2**	Anadromous & Resident Salmonids	Assess feasibility of **restoration at Apple Springs on the Lower Bridge River**.	Support options to increase spawning and rearing habitat quality in the Lower Bridge River.	Open	Lower Bridge
17	Rivers, Lakes & Reservoirs	Habitat-based Actions	**BRG.RLR.HB.17.01 Implement habitat restoration...protective measures-Upper Bridge Riv & Downton Res.upstream of La Joie Dam-P3,**	**3**	Anadromous & Resident Salmonids	**Implement habitat restoration, enhancement and/or protective measures** within sub-basins of the Bridge-Seton watershed (refer to priorities of sub-basins above) to improve salmonid spawning, incubation or rearing habitat, including riparian restoration. If a restoration plan has been completed under **Action 3**, please reference that plan for more information.	Sustain and restore habitat capacity and population viability of anadromous and resident salmonids.	Open	Throughout
			BRG.RLR.HB.17.02 Implement habitat restoration...protective measures-Middle Bridge Riv	**2**					

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			&Carpenter Res.upstream of Terzaghi Dam-P2						
17 cont.			**BRG.RLR.HB.17.03 Implement habitat restoration...protective measures-Lower Bridge River & Yalakom River-P1**	**1**					
			BRG.RLR.HB.17.04 Implement habitat restoration...protective measures-Anderson Lake &tributaries incl. Gates Creek-P1	**1**					
			BRG.RLR.HB.17.05 Implement habitat restoration...protective measures-Seton Res.&Seton Portage upstream of Seton Dam but below Anderson Lk–P1	**1**					
			BRG.RLR.HB.17.06 Implement habitat restoration...protective measures-Lower Seton Riv.downstream of Seton Dam-P1	**1**					
			BRG.RLR.HB.17.07 Implement habitat restoration, enhancement	**2**					

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			and/or protective measures-Cayoosh Creek-P2						
17 cont.			**BRG.RLR.HB.17.08 Implement habitat restoration, enhancement….protective measures-Bridge/Seton Watershed-P3**	**3**					
18	Rivers, Lakes & Reservoirs	Habitat-based Actions	**BRG.RLR.HB.18.01 Develop off-channel and side channel sites to provide spawning and rearing habitat-P1**	**1**	Anadromous & Resident Salmonids	**Develop off-channel and side channel sites to provide spawning and rearing habitat for Chinook Salmon, Coho Salmon, Steelhead and other salmonids.** Possible locations include the Lower Bridge River, Lower Seton, Gates Creek, Portage Creek, Cayoosh Creek and Upper Seton Lake. Preference is for off-channel habitats that have a groundwater influence.	Sustain and restore spawning and rearing habitat capacity for anadromous and resident salmonids.	Open	Throughout
19	Rivers, Lakes & Reservoirs	Habitat-based Actions	**BRG.RLR.HB.19.01 Conduct gravel placement and maintenance to improve spawning habitat-P3**	**3**	Anadromous & Resident Salmonids	**Conduct gravel placement and maintenance to improve spawning habitat.** Potential locations include the lower Bridge River (particularly upstream of Yalakom confluence), Upper and Lower Seton and Cayoosh Creek. Gravel placement activities should be preceded by an assessment of gravel stability. Before undertaking proposals under this action, check with FWCP for feasibility.	Sustain and restore spawning habitat capacity for anadromous and resident salmonids.	Open	Throughout
20	Rivers, Lakes & Reservoirs	Habitat-based Actions	**BRG.RLR.HB.20.01 Improve fish passage on the Yalakom to increase access to habitat for Chinook Salmon-P2**	**2**	Chinook Salmon	**Improve fish passage on the Yalakom to increase access to habitat for Chinook Salmon.** This could include removal of a partial barrier on the Yalakom, 15km upstream of its confluence with the Bridge River. Fish passage works should be preceded by a cost-benefit analysis that includes an assessment of impacts on Bull Trout. Improved fish passage needs to be endorsed by regulators.	Increase access to habitat for Chinook Salmon.	Open	Lower Bridge

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21	Rivers, Lakes & Reservoirs	Habitat-based Actions	**BRG.RLR.HB.21.01 Conduct habitat enhancement of the salmon spawning channels in Lower Seton-P1**	**1**	Anadromous & Resident Salmonids	**Conduct habitat enhancement of the salmon spawning channels in Lower Seton** including additional complexing, riparian planting, maintenance of siphons, and other actions. Work should build upon that conducted in recent years and could benefit Coho Salmon, Chinook Salmon and Steelhead/Rainbow Trout. This work should be informed by that conducted in **Action #10.**	Sustain and restore spawning and rearing habitat capacity for anadromous and resident salmonids.	Open	Lower Seton
22	All	Research & Information Acquisition	**BRG.ALL.RI.22.01 Inventory for species of interest that are likely in the watershed-P2**	**2**	Wildlife	**Inventory for species of interest that are likely in the watershed. Inventory actions must meet the following criteria:** • The data collected will clearly inform a specific natural resource management decision or conservation action; this includes a clear understanding of: - The data or knowledge gap that is currently limiting a decision-maker or party(ies) from making a conservation decision or undertaking a conservation action; - How the inventory has been specifically designed to fill the above-noted data/knowledge gap; and - The decision-makers' commitment to using the data or information to support a specific decision. • The data collection is well informed by a clear and specific management objective (land use plan, recovery plan etc.) that also informs the management decision or conservation action; this includes clarity of: - How the inventory work has been designed to specifically assess	Habitat enhancement opportunities. Maintain or, where feasible, increase the abundance of species of interest.	Open	Throughout

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22 cont.						the status or condition of the objective; and, - How the data will be used to inform/improve/clarify the management objective. Species of interest reflect engagement from FWCP partners and include, but are not limited to: • Mesocarnivores. Conduct risk assessment and evaluate population sustainability through monitoring program as part of multi-carnivore surveys in the watershed. Species of interest: Pacific Marten, American Mink, Lynx, Bobcat. Expand fisher monitoring surveys to identify extent of fisher population outside of Tyaughton and Yalakom drainages (areas identified by 16.W.BRG.03 Wolverine Inventory and Conservation in the southern Coast Mountains: Cadwallader, Hurley, Macparlan, upper Bridge). If necessary, implement enhancement strategies to maintain sustainable populations. • Evaluate distribution and abundance of porcupines in the Bridge-Seton watershed and examine potential causes for apparent declines over past 25 years. • Evaluate how beavers have been impacted by impoundment and how that effects the the overall health and benefits that the ecosystems provide.			

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23	All	Habitat-based Actions	**BRG.ALL.HB.23.01 Implement priority species- and habitat-related conservation actions...-P1**	**1**	Wildlife Species at Risk	**Implement priority species- and habitat-related conservation actions in the following (or most recent) Recovery Strategies and Management Plans for species at risk that are known to be in the watershed.** Conservation actions must be well informed by a clear and specific management objective and must be well informed by previous inventory in the watershed. • Management plan for the Spotted Bat (Euderma maculatum) in Canada (Environment Canada 2015) . Build upon data gathered on Spotted Bats in 14.W.BRG.01 Bridge-Seton watersheds: grassland bat management project. • Management plan for the Mountain Goat (Oreamnos americanus) in British Columbia (B.C. Ministry of Environment 2010). One project (12.W.BRG.04 Identification of Mineral Lick Locations and Use by Mountain Goats) identified three potential mineral lick sites for Mountain Goat in the Cayoosh Range of the Coast Mountains near Lillooet and confirmed heavy use at two of these. • Management plan for the Flammulated Owl (Otus flammeolus) in Canada (Environment Canada 2013). Build upon 06.W.BRG.01 Inventory and Habitat Enhancement of Western Screech and Flammulated Owls in the Bridge Coastal Study Area. • Recovery strategy for the Northern Spotted Owl (Strix	Habitat enhancement opportunities. Maintain or, where feasible, increase the abundance of species of interest.	Open	Throughout

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23 cont.						occidentalis caurina) in British Columbia (Environment Canada 2006). Build upon previous projects (e.g., 04.W.Br.03 Northern Spotted Owl Inventory and Monitoring, 05.W.Br.04 Inventory & Monitoring of the N. Spotted Owl, Screech-Owl, & Flammulated Owl, 16.W.BRG.13 & COA-F17-W-1314: 5 Year Restoration of the Lillooet Sub-Population of Spotted Owl in British Columbia). • Recovery Plan for the Western Screech-Owl, macfarlanei subspecies (Megascops kennicottii macfarlanei) in British Columbia (B.C. Ministry of Environment 2016). Build upon 12.W.SON.03 Western Screech Owl Conservation and Management for the Bridge-Seton Area (follow up on proposed conservation measures). • Recovery Strategy for the Common Nighthawk (Chordeiles minor) in Canada (Environment Canada 2016). • Management plan for the Coastal Tailed Frog (Ascaphus truei) in British Columbia (B.C. Ministry of Environment 2015). Build upon work completed in 09.W.BRG.01 Coastal Tailed Frog Inventory and Habitat Assessment in the Bridge-Seton Area and COA-F17-W-1286 Tailed Frog eDNA Assessment in the Bridge/Seton Watersheds. Support work to establish Wildlife Habitat Areas. • Management plan for the Western Toad (Anaxyrus boreas) in British Columbia (Provincial Western Toad Working Group 2014). Explore opportunities to reduce juvenile roadkill in Gun Creek Campground area. • Recovery plan for Dun Skipper (Euphyes vestris) in British Columbia (B.C. Ministry of Environment 2013). • Management plan for the Monarch (Danaus plexippus) in Canada (Environment and Climate Change Canada 2016).			

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24	Upland & Dryland	Research & Information Acquisition	**BRG.UAD.RI.24.01 Assess impacts on Grizzly Bear populations and movement-P2**	**2**	Grizzly Bear	**Assess impacts on Grizzly Bear populations and movement.** Examples include the effect of fire on forage supply (particularly the 2009 fire and subsequent fires) and non-motorized recreation impacts. Build upon many previous inventory and research projects on Grizzly Bears in the region. See www.fwcp.ca for reports. Particular attention should be paid to the Southern Chilcotin and the Stein-Nahatlatch.	Maintain or, where feasible, increase the abundance of species of interest.	Open	Throughout
25	Upland & Dryland	Research & Information Acquisition	**BRG.UAD.RI.25.01 Assess impacts on Fishers in the Bridge River drainage-P2**	**2**	Fisher	**Assess impacts on Fishers in the Bridge River drainage** with a focus on impacts of reservoir inundation and forest harvest on the supply of critical habitats. Data from this study will form the foundation of targetted mitigation actions. Build upon many previous inventory and research projects on fishers in the region. See www.fwcp.ca for reports.	Maintain or, where feasible, increase the abundance of species of interest.	Open	Bridge River watershed
26	Upland & Dryland	Research & Information Acquisition	**BRG.UAD.RI.26.01 Identify migration corridors... of Bighorn Sheep residing within the Relay-Tyaughton Watershed-P2**	**2**	Bighorn Sheep	**Identify migration corridors and seasonal movement patterns of Bighorn Sheep residing within the Relay-Tyaughton Watersheds.** See recommendations made by the radio-tracking study conducted in the William's Lake Forest District regarding access and disturbance management.	Identify core areas of use and enhancement opportunities while acquiring information to maintain movement corridors.	Open	Throughout
27	Upland & Dryland	Research & Information Acquisition	**BRG.UAD.RI.27.01 Identify high-risk domestic sheep and Bighorn Sheep interaction areas…-P2**	**2**	Bighorn Sheep	**Identify high-risk domestic sheep and Bighorn Sheep interaction areas and p**romote education material to both sheep owners and the general public regarding ways to minimize Bighorn Sheep and domestic sheep interactions.	Reduce high risk of Movi transmission and mitigate population decline	Open	Throughout

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28	Upland & Dryland	2-Habitat-based Actions	**BRG.UAD.HB.28.01 Through acoustic monitoring...identify /protect bat maternity roosts & winter hibernacula-P1**	**1**	Bats	Fourteen bat species have been found present in the Bridge-Seton watershed (14.W.BRG.01). Still to be completed are 1) Through acoustic monitoring or other methods (e.g., radio-tracking, DNA), **identify maternity roosts and winter hibernacula, and 2)** Pursue **protection of hibernacula and maternity roosts** (e.g., critical habitat, WHAs or wildlife habitat feature designations). Build upon data gathered on Spotted Bats in 14.W.BRG.01 Bridge-Seton watersheds: grassland bat management project.	Maintain or, where feasible, increase the abundance of species of interest.	open	Throughout
29	All	Habitat-based Actions	**BRG.ALL.HB.29.01 Conserve or enhance important habitats or mitigate habitat threats for priority bird species-P2**	**2**	High priority birds	**Conserve or enhance important habitats or mitigate habitat threats for priority bird species in the watershed**. This watershed is within Bird Conservation Region 9 and falls under the Canadian Intermountain Joint Venture. See the lists of priority species for wetlands, lakes and rivers, riparian habitat and grasslands and shrub-steppe at http://cijv.ca/where-we-work/. Proposed projects should refer to the priority lists and recommended conservation actions/guidance in the implementation plans (http://cijv.ca/resources/; to be posted April 2017). Build upon previous FWCP-funded projects (05.W.Br.03 Variation in Harlequin Duck Distribution and Productivity). Some Breeding Songbird Monitoring has taken place (11.W.SON.01).	Varied types of species and habitat conservation, protection and enhancement opportunities.	Open	Throughout
30	Upland & Dryland	Habitat-based Actions	**BRG.UAD.HB.30.01 Implement appropriate & feasible conservation items identified for wolverines...-P1**	**1**	Wolverine	**Implement appropriate and feasible conservation items identified for wolverines from past FWCP projects** (16.W.BRG.03 Wolverine Inventory and Conservation in the southern Coast Mountains) to ensure sustainability of this population.	Maintain or, where feasible, increase the abundance of species of interest.	Open	Throughout
31	Upland & Dryland	Habitat-based Actions	**BRG.UAD.HB.31.01 conserve and enhance important Fisher habitats within the Bridge watershed-P2**	**2**	Fisher	**Work with BC Hydro and other land managers to conserve and enhance important Fisher habitats within the Bridge watershed by building on information learned from Fisher projects.** Identify important rearing habitats for establishment of conservation measures such as Wildlife Habitat Areas.	Protect and/or restore rare and ecologically significant upland/dryland habitat.	Open	Throughout

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32	Wetland & Riparian	Habitat-based Actions	**BRG.WAR.HB.32.01 ...habitat enhancement of important dispersal corridors for River Otters -P2**	**2**	River Otter	Identify and implement options for **habitat enhancement of important dispersal corridors** for River Otters	Maintain or, where feasible, increase the abundance of species of interest.	Open	Terzaghi Dam and Seton River area
33	Upland & Dryland	Habitat-based Actions	**BRG.UAD.HB.33.01 Implement habitat enhancement activities …Mule Deer-P2**	**2**	Mule Deer	**Implement habitat enhancement activities** (e.g. prescribed burns) in Bridge -Seton watersheds that build upon knowledge and recommendations gathered in 07.W.BRG.01 Identification of Rocky Mountain Mule deer (*Odocoileus hemionus hemionus*) migration routes and seasonal ranges within the St'at'imc Nation Territory and BC Hydro Footprint and a four year project that investigated habitat use, migration ecology, and survival of Mule Deer (14.W.BRG.02: Mule Deer Buck Migrations and Habitat Use in the Bridge River, British Columbia).	Sustain and increase the food, social, ceremonial, recreational and/or commercial use of fish and wildlife resources.	Open	Throughout
34	Upland & Dryland	Habitat-based Actions	**BRG.UAD.HB.34.01 Restore and enhance the supply of cavities in trees for large cavity users-P2**	**2**	Multi-species	Restore and enhance the supply of cavities in trees for large cavity users (e.g., Black Bears (as dens), Fishers, Pacific Marten, Flying Squirrels, Western Screech-Owls). **Identify factors that control formation of large cavities in trees** to better manage this population-limiting resource for priority wildlife species in the watershed. Increase education about the importance of wildlife trees to reduce their removal as "danger trees".	Protect and/or restore rare and ecologically significant upland/dryland habitat.	Open	Throughout
35	Wetland & Riparian	Habitat-based Actions	**BRG.WAR.HB.35.01 Implement wetland&riparian restoration projects…through inventory, mapping or assesments-P1**	**1**	Wildlife	**Implement wetland and riparian restoration projects that are identified as high priorities through inventory, mapping or assessment in the Bridge-Seton watershed.** If a restoration plan has been completed under action 3, please reference that plan for more information. This can include managing invasive plants as needed.	Protect, restore and/or create new wetland and riparian habitat.	Open	Throughout

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36	Upland & Dryland	Species-based Actions	**BRG.UAD.SB.36.01 Assess & implement opportunities to restore the Stein-Nehatlatch Grizzly Bear Population-P2**	**2**	Grizzly Bear	**Assess and implement opportunities to restore the Stein-Nehatlatch Grizzly Bear Population.**	Maintain or, where feasible, increase the abundance of species of interest.	Open	Cayoosh ranges
37	All	Research & Information Acquisition	**BRG.ALL.RI.37.01 Inventory & restoration for at-risk...and/or culturally important plant species-P3**	**3**	At-risk Plants	**Inventory and restoration for at-risk (e.g., SARA-listed, red- and blue-listed) and/or culturally important plant species and ecological communities.** Potential species of interest: Kruckeberg's Holly Fern, Whitebark Pine, Whitish Rush, Tiny Suncress, Smooth Draba.	Habitat restoration opportunities. Maintain or, where feasible, increase the abundance of species of interest. Prevention of destruction of at-risk habitats while carrying out other projects.	Open	Throughout
38	Upland & Dryland	Species-based Actions	**BRG.UAD.SB.38.01 Build upon previously-funded Whitebark Pine work-P1**	**1**	Whitebark Pine	**Build upon previously-funded Whitebark Pine work** in Bridge-Seton watershed (COA-F17-W-1292 Whitebark Pine Restoration in the St'at'imc Territory).	Protect and/or restore rare and ecologically significant upland/dryland habitat.	Open	High elevations

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: Bridge River Water Use Plan. Executive Summary available at: https://www.bchydro.com/content/dam/hydro/medialib/internet/documents/environment/pdf/wup_bridge_river_executive_summary_pdf.pdf

BC Hydro. 2011. Bridge River Power Development Water Use Plan. Revised for Acceptance by the Comptroller of Water Rights. Available at: https://www.bchydro.com/content/dam/hydro/medialib/internet/documents/planning_regulatory/wup/lower_mainland/2011q2/bridge_river_wup_rev.pdf

BC Hydro. 2006. BC Hydro Fish Entrainment Strategy. Prepared for BC Hydro Generation Operations, Burnaby, BC.

BC Hydro. 2016. Fish passage decision framework for BC Hydro facilities.

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.

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

Green, R.N., and K. Klinka. 1994. A Field Guide for Site Identification and Interpretation for the Vancouver Forest Region. Report Land management handbook #28. British Columbia Ministry of Forests, Burnaby, BC.

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

Splitrock Environmental Sekw'el'was LP. 2016. Seton River corridor conservation and restoration project. Prepared for: Sekw'el'was and T'it'q'et Communities and BC Hydro Fish and Wildlife Compensation Program.

PREVIOUS STRATEGIC PLANNING DOCUMENTS

Bridge-Coastal Restoration Program. 2000 Strategic Plan, Volume 2, Watershed Action Plans, Chapter 10: Bridge River.

Bridge-Coastal Restoration Program. 2000 Strategic Plan, Volume 2, Watershed Action Plans, Chapter 11: Seton River.

Fish & Wildlife Compensation Program. 2011 Bridge-Seton Watersheds – Watershed Plan. Final Draft.

Fish & Wildlife Compensation Program. 2011 Bridge-Seton Watersheds – Riparian and Wetlands Action Plan. Final Draft.

Fish & Wildlife Compensation Program. 2011 Bridge-Seton Watersheds – Salmonid Action Plan. Final Draft.

Fish & Wildlife Compensation Program. 2011 Bridge-Seton Watersheds – Species of Interest Action Plan. Final Draft.

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