FWCP Fish & Wildlife COMPENSATION PROGRAM fwcp.ca

JORDAN RIVER WATERSHED ACTION PLAN

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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 existing 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 BC Hydro dam construction in this watershed. Clockwise from left and top right: Jordan River Diversion Dam, Elliot Dam, and Jordan River Generating Station. Credit: BC Hydro. Cover photo: Pink 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: JORDAN RIVER WATERSHED ACTION PLAN

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 Jordan River watershed. The focus of the next five-year period will be Priority Actions identified for fish and 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.

Priority actions eligible for FWCP funding fall into one or more of the following action types:

- **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.
- **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.
- **Land Securement** – These actions will contribute to the establishment of easements or covenants or the purchase of private land for conservation purposes.
- **Species-based Actions** – These actions will alleviate limiting factors for a species. Examples include restoration planning, captive breeding/rearing and reintroduction.
- **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 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 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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JORDAN RIVER 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 reflect FWCP's vision and mission. The Action Plans describe the strategies and ***Priority Actions*** *needed to support FWCP objectives. Please refer to the Action Plan Overview for more information on the on the process that was followed to develop Action Plans. The structure of this Action Plan is shown in Figure 1: Structure of FWCP Action Plan Overview and Action Plan components.*

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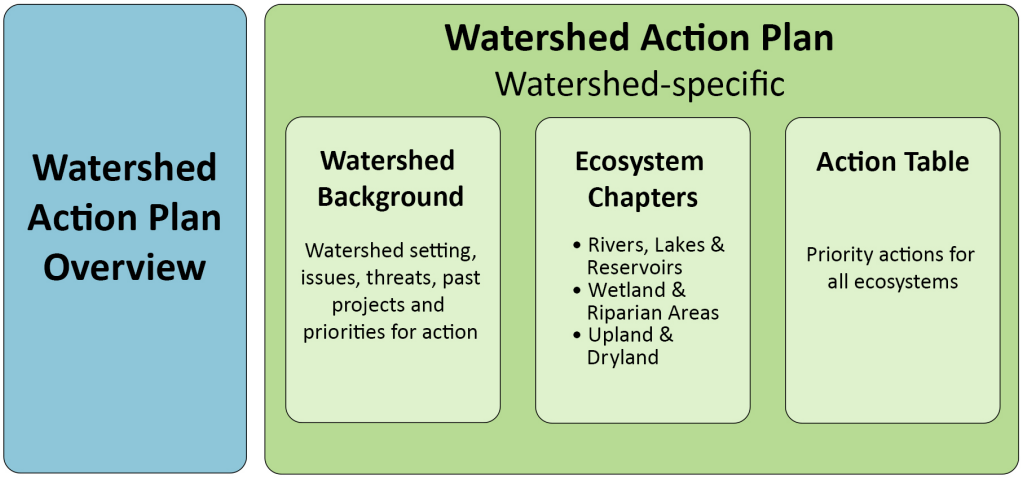

Figure 1: Structure of FWCP Action Plan Overview and Action Plan components.

Setting

The Jordan system is situated in the southern portion of Vancouver Island approximately 50 km northwest of Victoria. From its headwaters, the Jordan River flows southwest between the Sooke Hills and Seymour Mountain to the Pacific Ocean. Elevations within the Jordan River basin range from sea level to 1000 m. Precipitation is dominated by Pacific air masses meeting west-facing mountains and can lead to prolonged rain periods. Heavy precipitation occurs between October and April with an average of 500 mm in November. Inflows also occur due to snowmelt from May to July.

Hydropower facilities were first constructed in 1917 and currently consist of a series of dams and diversion reservoirs. The most upstream of which is Bear Creek Dam, whose reservoir is not actively managed and behaves as a natural lake with water flowing through a spillway notch in the dam. The Jordan Diversion Dam is approximately 2.5 km downstream of the Bear Creek Dam. It impounds a reservoir of 1800 ha with normal operating levels between 367 and 386 m. The Jordan drainage basin above Elliott Dam is approximately 144 km^2. Elliott Dam and Headpond are 1.6 km below the Jordan Dam. The Elliott Headpond has a small storage capacity and diverts water to the powerhouse through a 7.2 km tunnel where there is a single 170 MW capacity turbine. Most flow is diverted for power; however, 0.25 m^2/s is discharged into the natural channel of the Jordan River (BC Hydro, 2003). The amount of inflow received in the basin limits the generating ability of the system.

The watershed has a diverse group of users. Industry uses other than hydro-electric generation include forestry and mining. The watershed is used recreationally by hunters, fishers, hikers (the Kludahk Trail along the San Juan Ridge) and off-road motorized recreationists (Tanksy OHV Recreation Area). The watershed is of interest to the community of Jordan River, and the Pacheedaht, T'sou-ke, and Ditidaht First Nations.

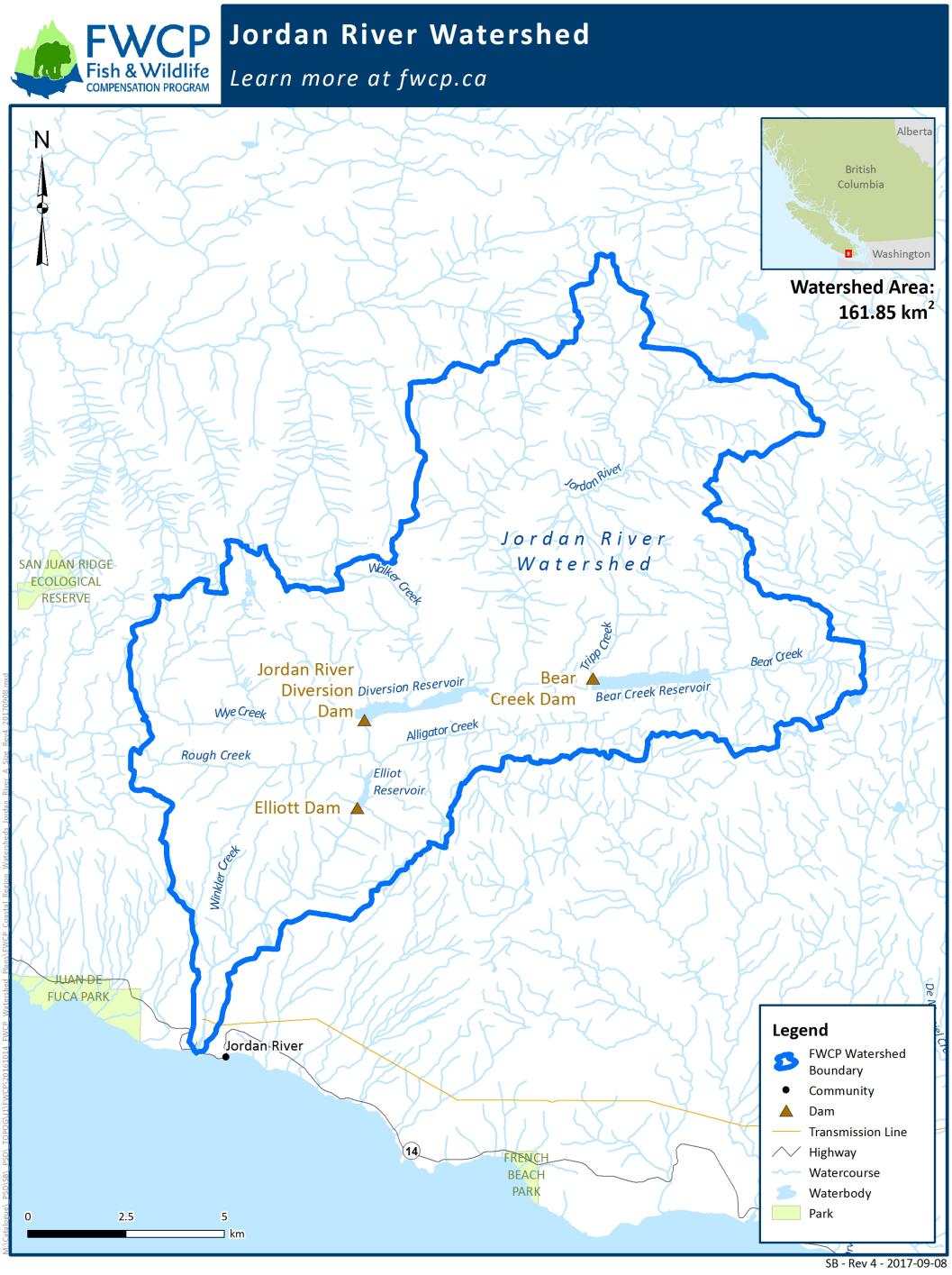

Figure 2: The FWCP Jordan River watershed boundary.

Land Ownership in the Jordan River Watershed

The eastern half of the watershed is private managed forest land currently owned by TimberWest Forest Corporation. The western half of the watershed is Crown land held in Tree Farm Licence (TFL) 61, operated by Pacheedaht Anderson Timber Holding Ltd. BC Hydro owns lands surrounding the facilities, reservoirs and along portions of the waterways. There are also numerous small, private properties scattered within the watershed. The watershed is within the Capital Regional District (CRD), and is therefore part of their regional planning initiatives (e.g., Regional Growth Strategy[1] and Regional Parks Strategic Plan[2]). 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.

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: Reservoir impoundment covers 193 ha of land, riparian areas and forest. Small reservoirs experiencing drawdown have reduced water quality by retaining anoxic bottom layers.

Habitat loss: Loss 57 ha of riparian habitat, 7 km of mainstem, 4 km of tributary, and 15 ha of channel habitat. Drawdowns at Diversion reservoir have reduced fish access to tributaries. The dam has reduced recruitment of large woody debris and gravel downstream.

Migration barriers: Elliott Dam and Diversion Dam blocked movement of resident fish within the upper system.

New habitat: Diversion reservoir has created new habitat for resident trout. FWCP funds have created wetlands in the Diversion reservoir that have provided new habitat for wetlands-dependent species such as Red-Legged Frogs and waterfowl.

Altered flow regime and spills: Periodic spills scour gravel below dam and transport fine sediments to spawning habitat in lower mainstem.

Diversions: A high portion of the water is diverted out of the river at Elliott dam, reducing the volume of water in the river.

Entrainment: Magnitude of entrainment mortality and injury is unknown. It would affect only resident species (Cutthroat and Rainbow Trout), as there is no anadromous passage up to Elliott Dam.

Non-hydro Impacts

Most of the Jordan River Watershed has experienced industrial forestry on both crown and private land. The historical impacts of mining are also evident. An extensive road network is an additional impact of industrial development.

[1] https://www.crd.bc.ca/project/regional-growth-strategy
[2] https://www.crd.bc.ca/docs/default-source/parks-pdf/regional-parks-strategic-plan-2012-21.pdf?sfvrsn=0

Objectives for the Jordan River Watershed

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 (Chum, Pink, Coho), Steelhead, sea-run Cutthroat Trout; and, (b) Resident salmonids (Rainbow and Cutthroat Trout).	Maintain and, where feasible, increase the abundance and distribution of species of interest (e.g., federally listed species-at-risk and species identified through government, community, and First Nations engagement). See Action Table for specific species.	Maintain and, where feasible, increase the abundance and distribution of species of interest (e.g., 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: Jordan River Watershed

FWCP has been funding projects in the Jordan River Watershed since 1999 under the Bridge-Coastal Restoration Program (BCRP) and subsequently under the Fish & Wildlife Compensation Program[3] Coastal Region. A full list of the reports from projects undertaken to date is available online at fwcp.ca. Below is a brief summary of the work undertaken during the 2010/2011 to 2015/2016 FWCP project years, as well as pertinent earlier work.

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

Rivers, Lakes & Reservoirs
Four Rivers, Lakes & Reservoirs projects were undertaken in the Jordan River Watershed between 2010/2011 and 2015/2016. Of these, three were Research and Information Acquisition projects associated with reintroduction of Pink Salmon or to support habitat restoration for the benefit of multiple fish species. One of these projects (14.JOR.01) developed a restoration plan for the Jordan River that included a series of practical options for the creation, augmentation and enhancement of important habitats for salmonids in the anadromous reaches of the Jordan River. The implementation of this restoration plan began in 2016, including a Habitat-based project to build a side channel in Reach 1, which will add up to 1,170 m^2 of spawning and rearing habitat.

Wetland & Riparian Areas
An evaluation of the suitability and distribution of Red-legged Frog breeding habitat was conducted in the Jordan River Watershed in 2004 and 2005 and a wetland complex was built on the edge of the Jordan Diversion Reservoir in 2009. A two-year Monitoring and Evaluation project tracked vegetation and wildlife use of the wetland between 2010/2011 and 2015/2016. Monitoring work showed successful native plant colonization of the wetland and use by wildlife species, including species at risk and those that are defined as high priority in the watershed, such as Northern Red-legged Frog. Substantial remaining work is required to address priority Wetland & Riparian Areas species and habitats in the Jordan River Watershed, including the development of Habitat- and Species-based actions derived from initial Research and Information Acquisition projects.

Upland & Dryland
A two-year project was undertaken during the 2010/2011 to 2015/2016 FWCP project years that addressed Upland & Dryland species. The objectives of this project were to increase den availability for American Black Bears through the enhancement of natural structures and the creation of artificial structures, given declining levels of natural den site availability in the watershed. Although there has been no use of the structures for denning, some structures have been visited by bears so there is potential for future den use. Further monitoring is required to evaluate their effectiveness.

Interactions with Other Ongoing Processes

Water Use Plan (WUP) – BC Hydro undertook Water Use Planning on the Jordan River 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
JORDAN RIVER WATERSHED

ECOSYSTEM CHAPTER: RIVERS, LAKES & RESERVOIRS

Actions for Rivers, Lakes & Reservoirs

The Action Table in this document (see page 20) 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 Jordan River Watershed

The Jordan River originates in the Seymour Mountain Range in south central Vancouver Island and drains into Juan de Fuca Strait adjacent to the community of Jordan River. It has a drainage area of 162 km^2 and a mean annual discharge of approximately 13.7 m^3/s (Burt 2012). The current anadromous stream length is very short and includes a 920 m tidal section and 555 m non-tidal section. Historically, the non-tidal length anadromous length may have been up to 1.5 km, assuming fish passage past natural barriers was possible. The watershed has small remnant stocks of Chum, Pink, and Coho Salmon, Steelhead and sea-run Cutthroat Trout that were more abundant prior to industrial disturbance to the watershed. The upper watershed contains three reservoirs and various tributaries that support resident Cutthroat and Rainbow Trout.

Limiting Factors

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

- **Water quality**: Water quality is poor, largely attributable to past mining activities in the area. The anadromous portion of the river became contaminated with dissolved copper through mining activities that began in 1919, which has greatly limited the freshwater rearing capacity of salmonids in the lower watershed. In 2008, the water quality of the lower river was substantially improved through the implementation of minimum fish flow releases from Elliot Dam. In the upper watershed, reservoir productivity may be limited in the summer months due to anoxic conditions in deeper water and warm temperatures at the surface, which limits the depth of the preferred layer for resident fish.
- **Habitat area**: Flow diversion has affected the wetted area between Elliot Dam and the tailrace, which has decreased the availability of spawning and rearing habitat for salmonids. Since 2008, the minimum fish flow release has improved these flow limitations to habitat area, and is enabling a recovery of some populations. Forestry development has also reduced habitat area in the estuary, particularly as a result of the creation and operation of the dryland sort and log booming.
- **Habitat quality**: The presence of the reservoirs and dams has altered spawning and rearing habitat quality throughout the watershed because of dam interception of gravel and wood movement from the upper through to the lower river. Periodic extreme flow releases from Elliot Dam exacerbate these conditions by scouring the streambed down to bedrock and boulders. Turbine flow releases from the tailrace also cause scour, fish displacement and fish stranding in the lower river.
- **Access**: Altered flow regimes and habitats are factors that affect fish passage in some locations. Fish passage across natural barriers in the lower river between Elliot Dam and the tailrace is impeded under low flow conditions.
- **Nutrient limitations**: The Jordan River and reservoirs have a naturally low nutrient content, and therefore low productivity of fish and other aquatic organisms.

Knowledge Status

Habitat

The Jordan River was and continues to be impacted by industrial activity including forestry, mining, and hydroelectric development, which led to a decline of anadromous and resident salmonids in the river. The fish flow releases that were provided beginning in 2008 have increased the habitat area for salmonids in the lower river and diluted copper contamination in the stream section between the mine site and the tailrace. This has allowed for some initial population recovery, although spawning and rearing habitat quantity and quality remains an issue. For example, spawning habitat is in short supply. The majority of Pink and Chum Salmon spawning would have historically occurred in the lower river below the tailrace, although current spawning habitat is limited and degraded. Reduced channel complexity and fish passage are two limiting factors in the anadromous reach above the tailrace that supports mainly Steelhead, Rainbow Trout and Coho Salmon. The estuary habitat is also much reduced and highly degraded, which may limit early life survival of Coho, Chum, Steelhead and sea-run Cutthroat Trout. For a thorough habitat description of the lower river and potential actions to restore river productivity see Burt and Hill (2015).

Knowledge Gaps

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

- The restoration plan for the lower Jordan River (Burt and Hill 2015) establishes a series of restoration options to improve fish production. However, there remains some uncertainty associated with the cost vs. benefit of the actions in consideration of ongoing flow variability and other limiting factors in the system.
- There is uncertainty associated with potential actions to restore the Jordan River estuary and the role of the estuary in limiting salmonid production in the watershed.
- There is interest in improving fish passage past some natural barriers in the lower river, although there remains some uncertainty associated with the cost vs. benefit of increasing passage.
- The population status and limiting factors for resident fish populations in the upper watershed is not well known, nor is the understanding of opportunities for restoration.

Objectives and Measure

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 and targets 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**
   Efforts are underway to restore anadromous salmon (i.e., Chum, Pink, and Coho) spawning and rearing habitat in the Jordan River system to rebuild natural populations to historical levels. In addition, Steelhead and sea-run Cutthroat Trout are valued in the lower river.
   Measures– Measures will be species- and project-specific.

2. **Sustain and increase the population viability of resident salmonids.**
   Rainbow and Cutthroat Trout reside in the three reservoirs of the Jordan River (Elliott, Diversion, and Bear Creek Reservoirs). These reservoirs have been stocked with these species by MOE since 1985, producing a partially self-sustaining population of fish. MOE has a goal of a self-sustaining reservoir population instead of continual stocking. The Jordan Water Use Plan (BC Hydro, 2003) introduced operating constraints to decrease daily and seasonal water level fluctuations in Diversion Reservoir with the intent of establishing a more effective littoral zone for Rainbow Trout. This appears to have resulted in an increase in the population of Rainbow Trout in Diversion Reservoir (Lough et al. 2010). Thus, the focus of this sub-objective is on habitat improvements for Rainbow and Cutthroat Trout.
   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. As additional context, it should be noted that fisheries management agencies have an overall responsibility to manage the fisheries resource at a level of abundance and distribution to support First Nations' traditional uses and rights. These responsibilities are met through other ongoing processes and it is not the direct responsibility of FWCP to accommodate First Nations treaty rights and aboriginal interests. That being said, First Nations' interests in overall conservation and sustainable use benefits have been incorporated into the development of this plan.
Measures — There are no specific measures required at this time, aside from those associated with Objective 1 and 2. As part of their overall management responsibilities, DFO uses information such as abundance trends and escapement estimates to regulate angling and commercial harvest. MOE collects information on angler days, catch per unit effort, and number of fishing licences sold in the region, which informs decisions related to angling regulations.

ECOSYSTEM CHAPTER: WETLAND & RIPARIAN AREAS

Actions for Wetland & Riparian Areas

The Action Table in this document (see page 20) 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 Jordan River Watershed

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.

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 or 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, but inundation following dam construction was likely the most significant source of habitat loss (e.g., Hawkes 2007). The area of inundation has not increased since dam construction, but the productivity of adjacent habitats has continued to be affected, either directly or indirectly as a result of BC Hydro operations. Restoration work has been conducted and one wetland has been created.

Knowledge Gaps

Options for wetland and riparian habitat securement, restoration or construction have not been assessed in the Jordan River Watershed. While wetland restoration and creation projects have been undertaken, the effectiveness of these projects in meeting management objectives has yet to be determined.

Objectives and Measures

The following objectives have been developed to define the scope of the Wetland and Riparian Areas 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.

The following objectives have been developed to define the scope of the Wetland & Riparian Areas Ecosystem Chapter, which guides funding decisions related to conservation, restoration, enhancement and sustainable use. 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.
***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 Areas

The Action Table in this document (see page 20) 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 Jordan River Watershed

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 due to inundation and infrastructure development have occurred and they contribute to the cumulative effects of human-related activities in these habitats and the watershed. Upland/dryland habitats are diverse and can range from unvegetated areas to forests, and alpine ecosystems. Different habitats are associated with distinct species assemblages that react to direct or indirect stressors in their distinct habitat niches.

Within the Jordan River Watershed, elevations range from sea level to 1000 m. At lower elevations, the climatic conditions are typified by moist, mild winters and cool but relatively dry summers. Upper elevations experience cooler temperatures, greater snowfall, and a shorter growing season. Most of the watershed is forested, with lower elevations dominated by Western Hemlock, Amabilis Fir, Western Red-cedar, and Douglas-fir. Shrub layers include Red Huckleberry, Alaskan Blueberry, Salal and Dull Oregon-grape. Higher-elevation forests are dominated by Yellow-cedar and Mountain Hemlock (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, mining, and hydro-electric development have resulted in substantial losses and alterations to habitat and habitat connectivity.
- **Habitat connectivity**: Habitat loss and road development have resulted in lost connectivity between habitats, which alter wildlife movement.

Knowledge Status

Habitat

The Jordan River Watershed has experienced extensive industrial development since the late 1800s including forest harvesting, mining as well as flooding related to hydroelectricity infrastructure (e.g., Hawkes 2007). Industrial development continues today with the ongoing harvest of old growth and second-growth forests, a copper mine on the east side of the Jordan River, hydroelectric operations and recreation (where access is possible). This has altered the distribution of forest ages and species composition, and has resulted in an extensive road network and associated direct and indirect impacts. The extent of these landscape changes has not been specifically quantified.

Knowledge Gaps

Knowledge of species and ecosystems in the Jordan River Watershed is limited. There have not been extensive inventories specifically targeting the Jordan River Watershed.

Objectives and Measures

The following objectives have been developed to define the scope of the Upland and Dryland 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 productive and diverse upland and dryland ecosystems.
Actions under this objective are aimed at protecting/enhancing rare or ecologically significant species and 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., fishing, 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.

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Action #	**Ecosystem Chapter**	**Action Type**	**Priority Action Short Description**	**Priority**	**Target Species**	**Priority Action**	**Intended Outcome**	**Delivery Approach**	**Location**
1	All	Research & Information Acquisition	**JOR.ALL.RI.01.01 Develop a current habitat assessment map-P1**	**1**	Fish & Wildlife	Develop a **current habitat assessment map** for priority fish & wildlife species in the watershed. Habitats to be assessed & mapped include: • Wetlands • Riparian Areas • Stream Habitats • Estuary 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 wildlife species. The assessment should focus on practical conservation and restoration opportunities. 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.). Recommendations should be made through this work for future management actions and assessments. The Capital Regional District is compiling existing ecosystem mapping products in 2016/2017 that will cover about half of the watershed (i.e., most of the western portion of the watershed that is within the TFL and a bit along the eastern boundary). Mapping exists for the privately-owned TimberWest Forest Corp. but is not publicly available.	Improved strategic planning for restoration opportunities.	Directed	Throughout
2	All	Research & Information Acquisition	**JOR.ALL.RI.02.01 Conduct a limiting factors analysis-Jordan River estuary-P1**	**1**	Fish & Wildlife	**Conduct a limiting factors analysis** for priority fish and/or wildlife for the Jordan River watershed or sub-basins to support prioritization of future projects. This will include an assessment of population status, habitat	To determine cost-benefit of potential	Directed	Throughout

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2 cont.			**JOR.ALL.RI.02.02 Conduct a limiting factos analysis-Lower Jordan River up to first dam-P1**	**1**		status or habitat capacity and/or a cost-benefit analysis of habitat-based actions proposed by the FWCP, and should be considerate of the root causes of degraded habitats and limitations to productive potential. For fish, sub-basins for assessment include the Jordan River estuary (Priority 1), the Lower Jordan River up to the first dam (Priority 1), and the Upper Jordan River and reservoirs (Priority 2). Analyses should build upon previous projects and ongoing assessments, including the Water Use Plan studies in association with local agency, First Nation and BC Hydro staff. Any analyses conducted in the lower Jordan River for fish must build upon the lower Jordan River restoration plan (14.JOR.01). Work should be done in cooperation with 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.	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.		
			JOR.ALL.RI.02.03 Conduct a limiting factors analysis-Upper Jordan River&Reservoirs-P2	**2**					
			JOR.ALL.RI.02.04 Conduct a limiting factors analysis-Jordan River Watershed-P2	**2**					
3	All	Research & Information Acquisition	**JOR.ALL.RI.03.01 Develop a comprehensive resotration&protection plan-Jordan River Estuary-P1**	**1**	Fish & Wildlife	**Develop a comprehensive restoration and protection plan** for fish and/or wildlife in the Jordan River watershed 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, limiting factors analysis); • Knowledge gaps and recommended research and/or assessment	To determine high priority, cost-effective habitat and/or species-based actions that can be supported by the FWCP.	Directed	Throughout
			JOR.ALL.RI.03.02 Develop a comprehensive resotration&protection plan-Upper Jordan River&reservoirs-P2	**2**					

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3 cont.			**JOR.ALL.RI.03.03 Develop a comprehensive resotration&protection plan-Jordan River Watershed-P2**	**2**		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 Chum, Pink, Coho, and Steelhead. High priority wildlife include bats, amphibians, and riparian-associated mammals and birds. Note that all estuary, riparian and wetland projects should include inventory of rare plants and invertebrates to prevent the destruction of at-risk habitats while carrying out other projects. 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 Jordan River estuary (Priority 1), and the Upper Jordan River and reservoirs (Priority 2). Restoration plans are best developed as 'living documents' so that they can be updated over time. For fish, the Lower Jordan River (Priority 1) already has a restoration plan (14.JOR.01) and specifically the next step for this portion of river is a detailed feasibility plan/site plan. For wildlife plans, build upon the Integrated Wildlife Habitat Restoration Plan for the Jordan River Watershed, southern Vancouver Island, British Columbia (06.W.JOR.01; Hawkes 2007). This watershed is within the Canadian Wildlife Service's National Wetland Conservation Fund priority areas for Wetland Restoration and Enhancement. *Please note that the FWCP may develop templates for this work. Please check with FWCP to see if these templates are available.			
			JOR.ALL.RI.03.04 Develop detailed feasibility plan/site plan-Lower Jordan River-P1	**1**					
4	All	Habitat-based Actions	**JOR.ALL.HB.04.01 Implement high priority habitat-based actions-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 17)**, or by the restoration and protection plan **(Action 3)** or other	Implement high priority, cost-effective	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**
4 cont.		Species-based Actions	**JOR.ALL.SB.04.02 Implement high priority species-based actions-P1**	**1**		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.	habitat and/or species-based actions that can be supported by the FWCP.		
5	All	Land Securement	**JOR.ALL.LS.05.01 conduct an options assessment for land securement-P1**	**1**	Fish & Wildlife	Considering ecosystem, conservation and/or local management objectives, conduct an **options assessment for land securement** that establishes priority area to be protected through and land securement and identifies feasible mechanisms (e.g., fee-simple purchase, covenants, WHAs, etc.). Prioritization of sites could be undertaken in cooperation with conservation organizations or the Capital Regional District (The San Juan Ridge and Jordan Ridge are areas of interest for new CRD Regional Parks).	Prioritize locations and secure partnerships for land securement.	Open	Throughout
6	All	Land Securement	**JOR.ALL.LS.06.01 Land securement-P1**	**1**	Fish & Wildlife	**Land securement** in association with partner organizations to address fish and/or wildlife management objectives or to support habitat-based actions proposed by the FWCP. Land securement could address ecosystem function objectives across the watershed plan chapters of Rivers, Lakes & Reservoirs, Riparian/Wetland, and Upland/Dryland. Refer to options assessment findings, **Action 5** above, before conducting land securement activities.	Conserve, protect and restore ecosystem function and resilience through land securement.	Open	Throughout
7	All	Monitoring & Evaluation	**JOR.ALL.ME.07.01 Develop and implement an integrated monitoring plan-P1**	**1**	Fish & Wildlife	Develop and implement an **integrated monitoring plan** for fish and/or wildlife in the Jordan watershed 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	**JOR.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 restoration actions and support future planning and prioritization.	Open	Throughout

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9	All	Monitoring & Evaluation	**JOR.ALL.ME.09.01 Conduct condition assessments and/or maintenance on habitat enhancements-P2**	**2**	Fish & Wildlife	Conduct **condition assessments and/or maintenance on habitat enhancements** supported by the FWCP. This could include the recommendation 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	**JOR.RLR.RI.10.01 improve productivity in the Upper Jordan River and reservoirs-P2**	**2**	Resident Salmonids	Assess and prioritize opportunities to **improve productivity in the Upper Jordan River and reservoirs** to support the establishment of a self sustaining Rainbow and Cutthroat trout fishery, while maintaining productive amphibian breeding areas.	Develop plan to sustain and increase population viability of resident salmonids in the Upper Jordan River and reservoirs.	Open	Upper Jordan River and reservoirs
11	Rivers, Lakes & Reservoirs	Habitat-based Actions	**JOR.RLR.HB.11.01 Conduct channel complexing and other habitat enhancements in the lower Jordan River-P1**	**1**	Anadromous & Resident Salmonids	**Conduct channel complexing and other habitat enhancements in the lower Jordan River** upstream of the powerhouse for multi-species benefit. This includes improvements to spawning, rearing and holding habitat for primarily Coho Salmon, Steelhead and Chum Salmon.	Increase the quality and quantity of salmon spawning, holding and rearing habitat in the Lower Jordan River.	Open	Lower Jordan River upstream of the Powerhouse
12	Rivers, Lakes & Reservoirs	Habitat-based Actions	**JOR.RLR.HB.12.01 Creation of side-channel habitat in the lower Jordan River-P1**	**1**	Anadromous & Resident Salmonids	**Creation of side-channel habitat in the lower Jordan River** below the powerhouse. This action may need to be supported by a land securement and/or would need land owner collaboration.	Increase salmon spawning and rearing habitat capacity in the Lower Jordan River.	Open	Lower Jordan River

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13	Rivers, Lakes & Reservoirs	Habitat-based Actions	**JOR.RLR.HB.13.01 Improve spawning and adult holding habitat in the Lower Jordan River-P1**	**1**	Chum Salmon and Pink Salmon	**Improve spawning and adult holding habitat in the Lower Jordan River** below the tailrace. Would primarily benefit Chum and Pink Salmon productivity. Work should be preceded by an assessment of gravel stability at high flows. In 2016/17 a hydraulic model was developed for the Lower Jordan River in anticipation of future restoration opportunities.	Increase the quality and quantity of salmon spawning and holding habitat in the Lower Jordan River.	Open	Lower Jordan River
14	Rivers, Lakes & Reservoirs	Habitat-based Actions	**JOR.RLR.HB.14.01 Increase fish passage throughout the lower Jordan River-P2**	**2**	Anadromous & Resident Salmonids	**Increase fish passage throughout the lower Jordan River** within the current flow regime upstream of the powerhouse for multi-species benefit. Fish passage can be improved up to the falls that are above the confluence with Sinn Fein Creek but below Elliot Dam. Increased fish passage would primarily benefit Coho Salmon and Steelhead.	Increase access to salmon spawning, holding and rearing habitat in the Lower Jordan River.	Open	Lower Jordan River upstream of the Powerhouse
15	Rivers, Lakes & Reservoirs	Habitat-based Actions	**JOR.RLR.HB.15.01 Improve quality&quantity of juvenile salmon rearing habitat in the Jordan River estuary-P1**	**1**	Anadromous Salmonids	**Improve quality and quantity of juvenile salmon rearing habitat in the Jordan River estuary**. If a restoration plan has been completed under A**ction 3,** please reference that plan for more information.	Increase the quality and quantity of salmon rearing habitat in the Jordan River estuary.	Open	Jordan River estuary
16	Rivers, Lakes & Reservoirs	Habitat-based Actions	**JOR.RLR.HB.16.01 Conduct habitat enhancements in the Upper Jordan River and reservoirs-P2**	**2**	Resident Salmonids	**Conduct habitat enhancements in the Upper Jordan River and reservoirs.** If a restoration plan has been completed under A**ction 3,** please reference that plan for more information.	Increase the quality and quantity of resident salmon spawning, holding and rearing habitat in the Upper Jordan River.	Open	Upper Jordan River and reservoirs

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17	Wetland & Riparian	Research & Information Acquisition	**JOR.WAR.RI.17.01 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 the	Maintain or, where feasible, increase the abundance of species of interest.	Open	Throughout

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17 cont.	Upland & Dryland	Research & Information Acquisition	**JOR.UAD.RI.17.02 Inventory for species of interest that are likely in the watershed-P2**	**2**		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 (i.e., Ermine, Pacific Marten, American Mink and North American River Otter). Conduct risk assessment and evaluate population sustainability through a monitoring program. Note that genetic analyses may be needed to determine Ermine subspecies *(anguinae)* validity. If necessary, implement enhancement strategies to maintain sustainable populations. If part of a multi-year study, provide information about future objectives and actions. • Western Water Shrew (*brooksi* subspecies). Inventory through environmental DNA or other innovative methods (e.g., hair collection). Environmental DNA methodology can also be used concurrently to survey for at-risk amphibian species. • Western Screech-Owl. If present, refer to the Recovery plan for the Western Screech-Owl, *kennicottii* subspecies in British Columbia (Ministry of Environment 2013) for priority species- and habitat-related conservation actions within the Jordan River watershed. • Painted Turtle (Pacific Coast Population). If present, refer to the Recovery plan for the Painted Turtle – Pacific Coast Population (Chrysemys picta pop. 1), in British Columbia (Western Painted Turtle Recovery Team 2016) for priority species- and habitat-related conservation actions within the Jordan River watershed. • Amphibians (species of interest: Ensatina, Wandering Salamander, Western Toad and Long-toed Salamander). If present, refer to the Management Plan for the Wandering Salamander (Aneides vagrans) in British Columbia (BC Ministry of Environment 2017) and the Management Plan for the Western Toad (Anaxyrus boreas) in British Columbia (Provincial Western Toad Working Group 2014) for conservation actions. Build on inventories conducted in 2004 and rimplement restoration recommendations.			
18	Wetland & Riparian	Habitat-based Actions	**JOR.WAR.HB.18.01 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	Stable or increasing population of at-risk species. Habitat	Open	Throughout

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18 cont.	Upland & Dryland	Habitat-based Actions	**JOR.UAD.HB.18.02 Implement priority species- and habitat-related conservation actions…P1**	**1**		the watershed. • Management Plan for Roosevelt Elk in British Columbia (Ministry of Forests, Lands and Natural Resource Operations 2015). • Management Plan for the Northern Red-legged Frog (Rana aurora) in Canada [Proposed] (Environment Canada 2016).	enhancement opportunities.		
19	Upland & Dryland	Habitat-based Actions	**JOR.UAD.HB.19.01 Determine presence, identify/protect bat Maternity roosts & winter hibernacula-P1**	**1**	Bats	1) **Determine presence** of bat species, especially those species potentially vulnerable to White Nose Syndrome; 2) Through acoustic monitoring or other methods (e.g., radio-tracking, DNA), **identify bat maternity roosts and winter hibernacula**; and 3) **Pursue protection of bat hibernacula and maternity roosts** (e.g., critical habitat, WHAs or wildlife habitat feature designations) that are identified.	Maintain or, where feasible, increase the abundance of species of interest. Identification of which species are present in the watershed. This work should lead to identification and protection of maternity roosts and hibernacula.	Open	Throughout
20	Upland & Dryland	Habitat-based Actions	**JOR.UAD.HB.20.01 Restoration/enhancement of American Marten denning-P2**	**2**	Pacific Marten	Evaluate options and implement **restoration/enhancement for Pacific Marten denning (or other) habitats** in disturbed watersheds.	Protect and/or restore rare and ecologically significant upland/dryland habitat.	Open	Throughout

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21	Upland & Dryland	Habitat-based Actions	**JOR.UAD.HB.21.01 Assess and implement opportunities for restoration of priority ungulate habitats-P2**	**2**	Elk & Deer	Work collaboratively with the Province, private landowners, other land managers and First Nations to a**ssess and implement opportunities for restoration of priority ungulate habitats**.	Sustain and increase the food, social, ceremonial, recreational and/or commercial use of fish and wildlife resources.	Open	Throughout
22	All	Habitat-based Actions	**JOR.ALL.HB.22.01 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 5 and falls under the Pacific Birds Habitat Joint Venture. See the lists of priority species under the North American Wetlands Conservation Act at: http://www.pacificbirds.org/nawca-priority-species/. Proposed projects should refer to the priority lists and recommended conservation actions/guidance in the implementation plans (http://www.pacificbirds.org/science-and-planning/state-or-regional-plans/).	Varied types of species and habitat conservation, protection and enhancement opportunities.	Open	Throughout
23	Wetland & Riparian	Habitat-based Actions	**JOR.WAR.HB.23.01 Implement wetland and riparian restoration projects-P1**	**1**	Wildlife	**Implement wetland and riparian restoration projects** that are identified as high priorities through inventory, mapping or assessment. 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
24	Wetland & Riparian	Monitoring & Evaluation	**JOR.WAR.ME.24.01 Monitor the efficacy of the FWCP-funded wetlands created in 2009-P1**	**1**	Amphibians	**Monitor the efficacy of the FWCP-funded wetlands created in 2009.** Focal species include, but are not limited to, Red-Legged Frogs, Western Toads and Long-toed Salamanders. Build upon past monitoring efforts (11.W.JOR.01 and 12.W.JOR.01).	Increased knowledge about whether enhancement and mitigation activities are effective and thus whether they should be undertaken.	Open	Diversion Reservoir

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25	All	Research & Information Acquisition	**JOR.ALL.RI.25.01 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.** Species of interest: White Glacier Lily, Nodding Semaphoregrass, Menzies' Burnet and Vancouver Island Beggarticks.	Habitat enhancement or protection opportunities.	Open	Throughout

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