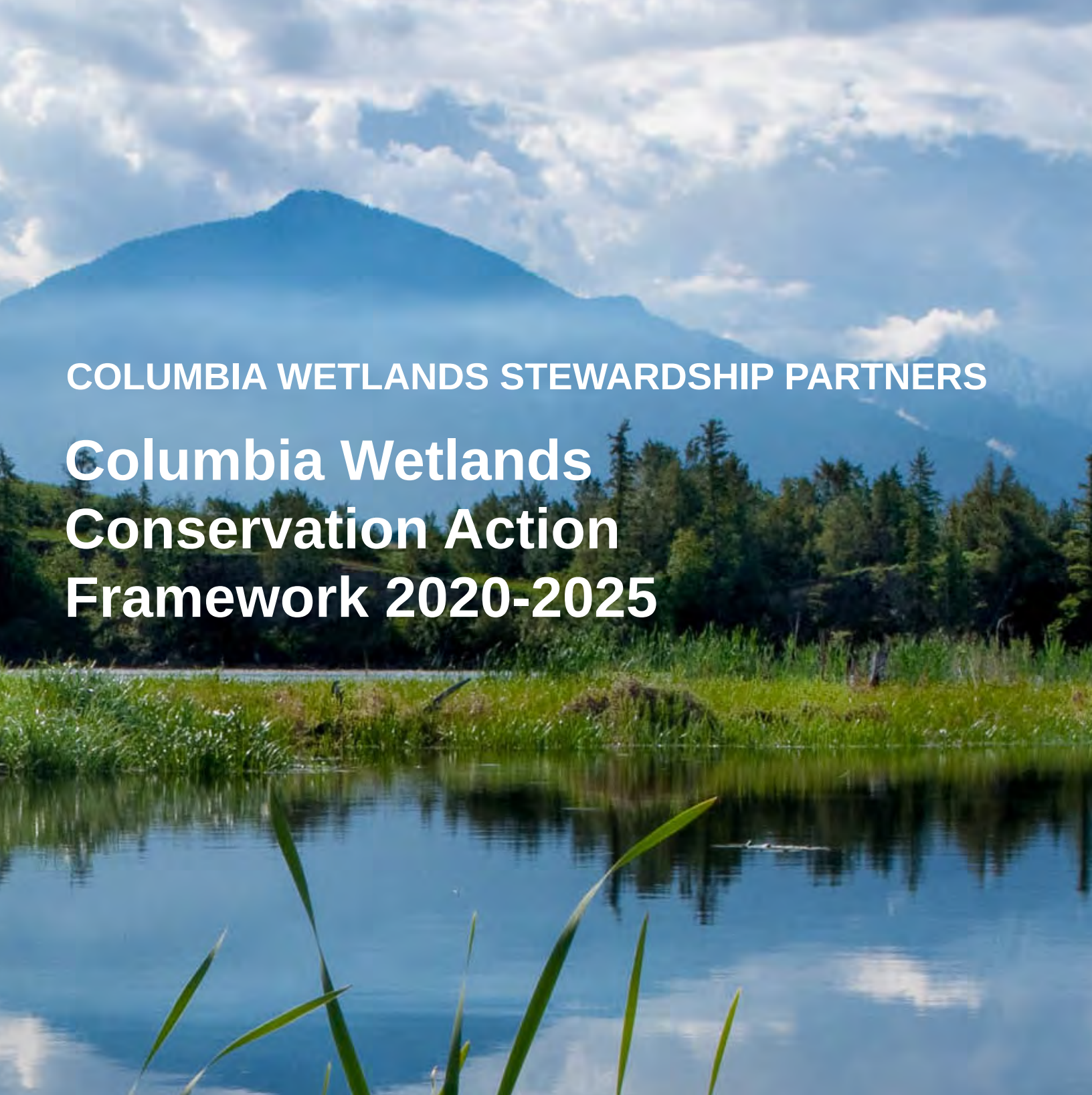




COLUMBIA WETLANDS STEWARDSHIP PARTNERS

Columbia Wetlands Conservation Action Framework 2020-2025

Strategy Document for Conserving and Managing the Columbia Wetlands of the Upper Columbia Valley

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This framework was developed in 2019 and intended as a living document to be reviewed annually by CWSP's Board of Directors. We gratefully acknowledge financial support from the Columbia Basin Trust, Habitat Conservation Trust Foundation, Columbia Valley Community Foundation, Sitka Foundation, Lush Foundation, and CWSP's ongoing partnerships with the Province of British Columbia, Regional District of East Kootenay, local communities, and members of the Akisqnuq First Nation and Shuswap Band.



EXECUTIVE SUMMARY

This Columbia Wetlands Conservation Action Framework for 2020-2025 provides a five-year strategy for the Columbia Wetlands Stewardship Partners (CWSP) to strengthen our leadership and effectiveness in conserving the exceptional ecological and cultural values of the Columbia Wetlands.

WE INTEND FOR THIS FRAMEWORK TO INSPIRE AND ENCOURAGE OUR PARTNERSHIP TO WORK COOPERATIVELY TOWARDS ACHIEVING COMMON GOALS AND ADDRESSING COMMON THREATS IN ORDER TO IMPROVE THE OVERALL ECOLOGICAL HEALTH OF THE WETLANDS.

The Upper Columbia River and adjacent Columbia Wetlands are one of the largest wetland complexes in British Columbia and one of the largest floodplain systems in North America. The wetlands encompass 26,000 hectares and are one of the few remaining intact portions of the Pacific Flyway for migrating birds. The natural levees make the Columbia Wetlands incredibly unique, separating several hundred sub-basins with differing amounts of marsh, open water, riparian shrubs and floodplain forest. It is a large landscape with overlapping values of high biodiversity, ecosystem services, and climate change adaptation and mitigation.

DUE TO THE BIOLOGICAL AND ECOLOGICAL IMPORTANCE OF THE COLUMBIA WETLANDS AND THE COMPLEX MIX OF LAND TENURES, THEIR MANAGEMENT IS MULTIFACETED INVOLVING MANY DIFFERENT JURISDICTIONS OF FEDERAL, PROVINCIAL, MUNICIPAL AND PRIVATE LANDS. FOR THESE REASONS, THE COLUMBIA WETLANDS STEWARDSHIP PARTNERS HAS DEVELOPED A STRATEGIC APPROACH FOR THE ENTIRE COLUMBIA WETLAND SYSTEM TO GUIDE FUTURE MANAGEMENT AND STEWARDSHIP OF THIS INTERNATIONAL TREASURE AND RAMSAR SITE.

This conservation framework ensures CWSP will continue to support government commitment to the Ramsar designation and to operate in accordance with the current Ramsar Strategic Plan. It also supports the province in developing and implementing the Columbia Wetlands Wildlife Management Area (CWWMA) management plan to benefit regionally and internationally significant fish and wildlife species and their habitats.

The conservation framework also identifies over 90 “conservation targets”, defined as species, habitat types, wildlife habitat features, special landscape elements, and ecological processes that are important for protective action. Conservation targets represent the biological diversity and unique habitats of the Columbia Wetlands ecosystem that are

required to sustain its ecological integrity and healthy functioning.

The framework also identifies 47 “threats” (negative impacts) which may significantly stress or impair conservation targets and directly impact species viability, habitat quality, or ecological functioning.

The impacts are activities or processes that are causing (or may cause) the destruction, degradation and/or impairment of one or more of the identified conservation targets of the Columbia Wetlands, and are grouped into six categories: 1) direct loss or impairment of habitats and species; 2) transportation and utilities; 3) invasive species; 4) recreational pressure and human use; 5) impact of climate (current and future); and 6) cumulative effects. Many, and likely all, of the conservation targets will face combined stresses. The cumulative effects of current (and emerging) physical and biological stressors can have a profound impact on the ecological functions of the Columbia Wetlands and its adjacent landscape.



Columbia Wetlands (Photo: Pat Morrow)

FIVE STRATEGIC DIRECTIONS WILL GUIDE CWSP OVER THE NEXT FIVE YEARS. THE DIRECTIONS ARE **PARTNERSHIP, AWARENESS, RESEARCH, STEWARDSHIP, AND MANAGEMENT – EACH DIRECTION IS SUPPORTED BY A LONG-TERM GOAL AND DESIRED OUTCOME TO HELP FOCUS ASPIRATIONS AND EFFORTS FOR ACHIEVEMENT.**

Priority actions reflect the key roles, responsibilities, or services CWSP will provide in order to conserve and steward this important wetland ecosystem. Some of the priority actions may require field research; some may involve strengthening and/or implementing local or provincial government policies; others may call on grassroots member activities; while others may require group consensus about ways in which to support current regional initiatives and management plans.

Over the next five years, CWSP will enhance implementation of this strategic action framework through participatory engagement and by advancing education and awareness, research, stewardship and management efforts.

We intend this strategic framework to be a living document which will be reviewed annually by CWSP’s Board of Directors.

I. INTRODUCTION

PURPOSE

The purpose of this Columbia Wetlands Conservation Action Framework for 2020-2025 is to provide a five-year strategy for the Columbia Wetlands Stewardship Partners (CWSP) whose mandate is to steward the Upper Columbia River and Columbia Wetlands as a single system irrespective of ownership or jurisdiction and to take a proactive stance in dealing with issues that could impact the health of the wetlands.

The Upper Columbia River and adjacent Columbia Wetlands are one of the largest wetland complexes in British Columbia. This 180 kilometre-long, biologically-rich system extends northward from Canal Flats to Donald within the Rocky Mountain Trench of the Canadian Rockies of southeastern British Columbia (Figures 1-4). Encompassing the northward-flowing Columbia River, this 26,000-hectare wetland system is also one of the few remaining pristine floodplain wetlands left in North America; and it contains the only undammed section of the entire 2,000 kilometre-long Columbia River. The Columbia Wetlands and River system includes water from Columbia Lake and Lake Windermere¹. Both lakes are integral components of the overall system and are incorporated by association into this framework. While developing conservation strategies for the lakes is beyond the scope of this document, CWSP recognizes that conservation efforts for the wetlands will take into consideration conservation efforts on the lakes and to coordinate where possible.

The Columbia Wetlands system is integral to the ecological health and functioning of the Columbia Valley and beyond. It is a large landscape with overlapping values of high biodiversity, wildlife migrations, ecosystem services, and climate change adaptation and mitigation.

FIRST, THE WETLANDS PROVIDE CRITICAL HABITAT FOR MANY SPECIES AT RISK FOR WHICH THE PROVINCIAL GOVERNMENT AND THE FEDERAL COMMITTEE ON THE STATUS OF ENDANGERED WILDLIFE IN CANADA (COSEWIC) HAVE DEVELOPED SPECIES AT RISK RECOVERY PLANS.

In 2017, the BC Forest Service held a workshop called “Integrated Silviculture Strategy for the Invermere and Cranbrook Timber Supply Area (TSA)”. In the discussion paper for the Invermere TSA, species of flora and fauna were cited under the Species at Risk subsection. Specifically, 12 species that occur in the Columbia Wetlands are federally listed under the

¹ Both shallow lakes (maximum depth of 5 metres) contribute hydrologically to the Columbia River. Water flowing from Columbia Lake, is added to by Lake Windermere, and this combined source contributes greatly to the volume of water within the Columbia River and Wetlands.

Species at Risk Act (SARA): American badger (*Taxidea taxus*), common nighthawk (*Chordeiles minor*), Lewis's woodpecker (*Melanerpes lewis*), little brown myotis (*Myotis lucifugus*), northern leopard frog (*Lithobates pipiens*), northern myotis (*Myotis septentrionalis*)², northern rubber boa (*Charina bottae*), peregrine falcon (*Falco peregrines*), short-eared owl (*Asio flammeus*), Williamson's sapsucker (*Sphyrapicus thyroideus*), western toad (*Anaxyrus boreas*), and westslope cutthroat trout (*Oncorhynchus clarkii lewisi*).



Northern leopard frog reintroduction is an important species at-risk recovery effort in the Columbia Wetlands. (Photo: Larry Halverson)

There are 29 at-risk bird species that utilize habitat of the Columbia Wetlands. Bird species that occur in the Columbia Wetlands that are **federally listed under the Species at Risk Act (SARA) as either Threatened or of Special Concern** are: common nighthawk (*Chordeiles minor*), Lewis's woodpecker (*Melanerpes lewis*), peregrine falcon (*Falco peregrines*), short-eared owl (*Asio flammeus*), bank swallow (*Riparia riparia*), barn swallow (*Hirundo rustica*), western grebe (*Aechmophorus occidentalis*), horned grebe (*Podiceps auritus*), long-billed curlew (*Numenius americanus*), bobolink (*Dolichonyx oryzivorus*), rusty blackbird (*Euphagus carolinus*), evening grosbeak (*Coccothraustes vespertinus*), and olive-sided flycatcher (*Contopus cooperi*)³.

Additional **provincially listed at-risk birds** (red or blue-listed) found in the Columbia Wetlands during the Columbia Wetlands Waterbird Survey (2015-2019) and/or the Columbia Wetlands Marsh Bird Monitoring Project (2016-2019) are: eared grebe (*Podiceps nigricollis*), Tundra swan (*Cygnus columbianus*), great blue heron (*Ardea herodias herodias*), American bittern (*Botaurus lentiginosus*), rough-legged hawk (*Buteo lagopus*), surf scoter (*Melanitta perspicillata*), American white pelican (*Pelecanus erythrorhynchos*), California gull (*Larus californicus*), Caspian tern (*Hydroprogne caspia*), Swainson's hawk (*Buteo swainsoni*), broad-winged hawk (*Buteo platypterus*), black swift (*Cypseloides niger*), white-throated swift (*Aeronautes saxatalis*), American avocet (*Recurvirostra americana*), double-crested cormorant (*Phalacrocorax auritus*), and red-necked phalarope (*Phalaropus lobatus*).

SECOND, THE COLUMBIA WETLANDS PROVIDE IMPORTANT ECOLOGICAL FUNCTIONS AND SERVICES, WHICH ARE LIFE SUPPORT SYSTEMS PROVIDED FREE OF CHARGE FROM THE NATURAL ENVIRONMENT THAT ARE ESSENTIAL TO RURAL AND URBAN LIFE.

Ecosystem functioning underpins biological diversity, and the provision of ecosystem services are essential for environmental and human well-being. Services such as: water filtration, water storage for flood and drought control, groundwater recharge, processing and

² To date, the Kootenay Community Bat Project knows of no data to confirm that Northern Myotis occur in the Columbia Wetlands. (Isaac, L. personal communication on April 19, 2019).

³ Darvill, R. personal communication on November 26, 2019.

sequestering of carbon and other nutrients, and erosion control through shoreline stabilization, benefit the healthy functioning of the natural environment and local livelihoods such as agriculture, economic development and outdoor recreation.

THIRDLY, AND PERHAPS MOST SIGNIFICANT IN TERMS OF CONSERVATION PLANNING FOR THE FUTURE, THE COLUMBIA WETLANDS WILL LIKELY HELP BUFFER THE IMPACTS OF CLIMATE CHANGE BY PROVIDING MICROCLIMATES AND MOIST REFUGIA FOR NATIVE FISH, WILDLIFE AND PLANTS AS WARMER AND DRIER CONDITIONS INCREASE IN VALLEY BOTTOMS OVER THE COMING DECADES.

Maintaining current environmental conditions so native species can remain longer in their current range will enable them to adapt and shift their distribution more gradually to changing annual temperatures and precipitation associated with a hotter-drier climate regime. Due to its north-south orientation, the Columbia Wetlands could further help reduce the potential negative impacts of climate change on regional biological diversity and play an important role as a landscape connector, facilitating species' northward migration. In addition, protecting wetlands from human disturbance is perhaps the most significant low cost natural solution for mitigating climate change because intact wetlands retain their ability to sequester carbon, thereby preventing release of stored carbon.

Due to the ecological importance of the wetlands and the complex mix of land tenures, their management is multifaceted involving many different jurisdictions of federal, provincial, municipal, and private lands.

The Columbia Wetlands are part of the traditional territory of the Ktunaxa Nation, Secwepemc Nation, and Shuswap Band. There are four land parcels that are managed as a National Wildlife Area. Provincial lands include Parks, Ecological Reserves, and Wildlife Management Areas of which the most geographically extensive is the Columbia Wetlands Wildlife Management Area. There are also private lands, including some properties secured for conservation purposes managed by organizations such as the Nature Conservancy Canada and the Nature Trust of BC. The Canadian Pacific Railway has a right-of-way that spans the length of the Columbia Wetlands.

GIVEN THE GEOGRAPHIC COMPLEXITY AND VARYING INTERESTS, MANDATES, AND CAPACITIES OF GOVERNMENT AGENCIES, LOCAL COMMUNITIES, LANDOWNERS, AND GROUPS INVOLVED IN SOME ASPECT OF CARING FOR THE COLUMBIA WETLANDS, DEVELOPING A COOPERATIVE STRATEGY FOR PRIORITIZING MANAGEMENT AND STEWARDSHIP ACTIONS IS CRITICAL TO THE LONG-TERM FUNCTIONING OF THIS EXCEPTIONAL ECOSYSTEM.



For these reasons, the Columbia Wetlands Stewardship Partners has developed a conservation strategy for the entire Columbia Wetland system to guide future management and stewardship of this international treasure.

Spring arrives at Wilmer wetlands, which is one of four wetland units managed by the Canadian Wildlife Service in the Columbia National Wetland Area (NWA). The other three units managed by the Canadian Wildlife Service are Spillimacheen, Brisco, and Harrogate. The primary purpose of NWAs is the protection and conservation of wildlife and their habitat. NWAs are protected and managed according to the Wildlife Area Regulations under the Canada Wildlife Act. (Photo: Pat Morrow).

We intend for this framework to serve our partners and stakeholders by aligning common interests, engaging diverse perspectives, and leveraging resources in order to implement activities that will stem the loss of biodiversity and preserve the overall health of the Columbia Wetlands.

Some of the priority actions may require field research; some may involve strengthening and/or implementing local or provincial government policies; others may call on grassroots member activities; while others may require group consensus about ways in which to support current regional initiatives and management plans. As we move forward on implementation, we will look for how our work is complementary to other local, regional, provincial, national and international initiatives (Appendix B).

Over the next five years, CWSP will guide implementation of this strategic action plan through participatory engagement, and by advancing education and awareness, research, management, and stewardship efforts.

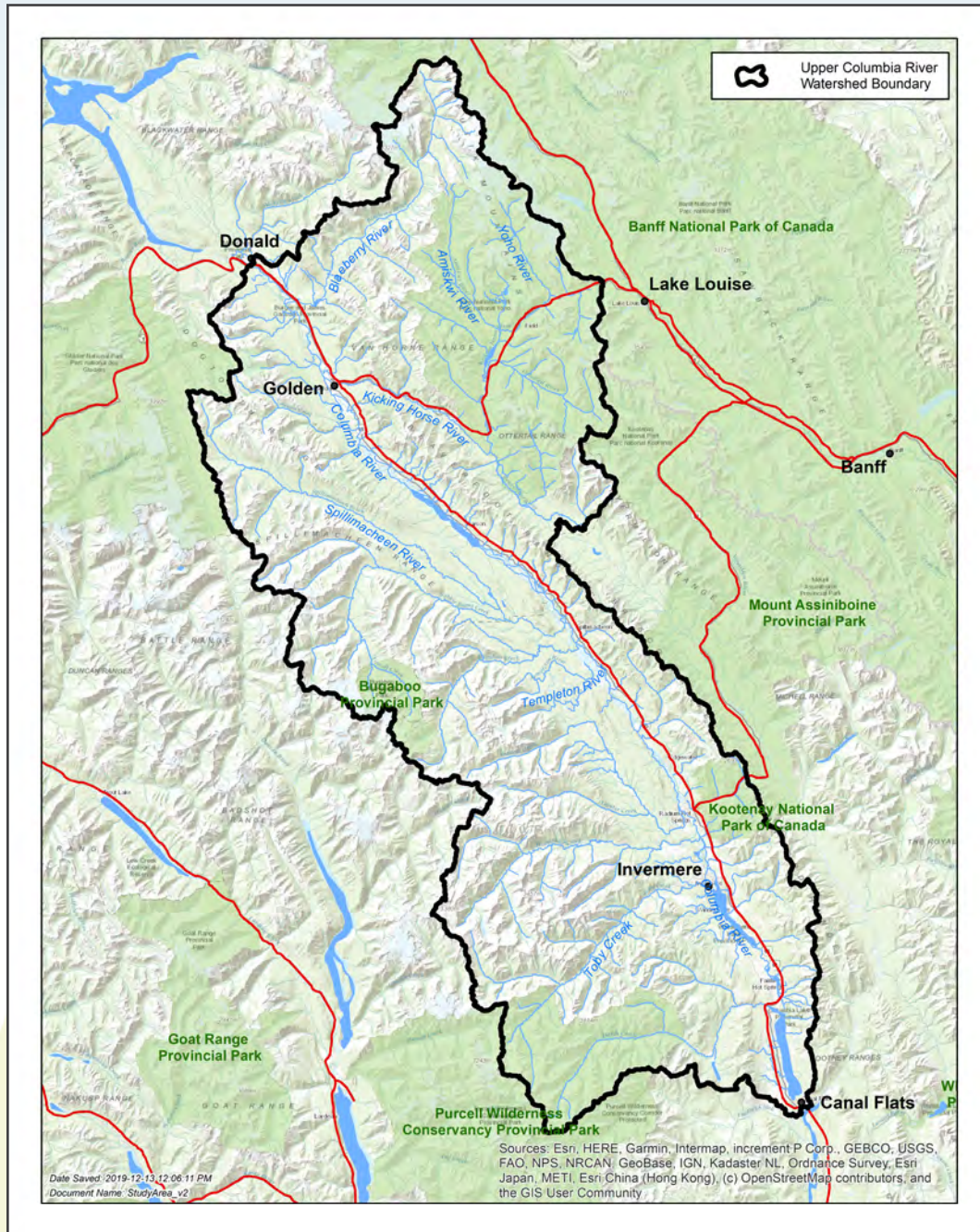


Figure 1. Landscape-level map of the watershed that contains the 180 kilometre-long Upper Columbia River and adjacent Columbia Wetlands located in the valley bottom of the Rocky Mountain Trench. The solid black line illustrates the Upper Columbia Watershed boundary.

The landscape view of the Columbia Wetlands provided in Figure 1 is divided into three sections in the following Figures 2-4 in order to provide a closer view of the river, lakes and wetlands, and adjoining creeks that feed them. From north to south the sections are: Donald to Spillimacheen, Spillimacheen to Invermere, and Invermere to Canal Flats.

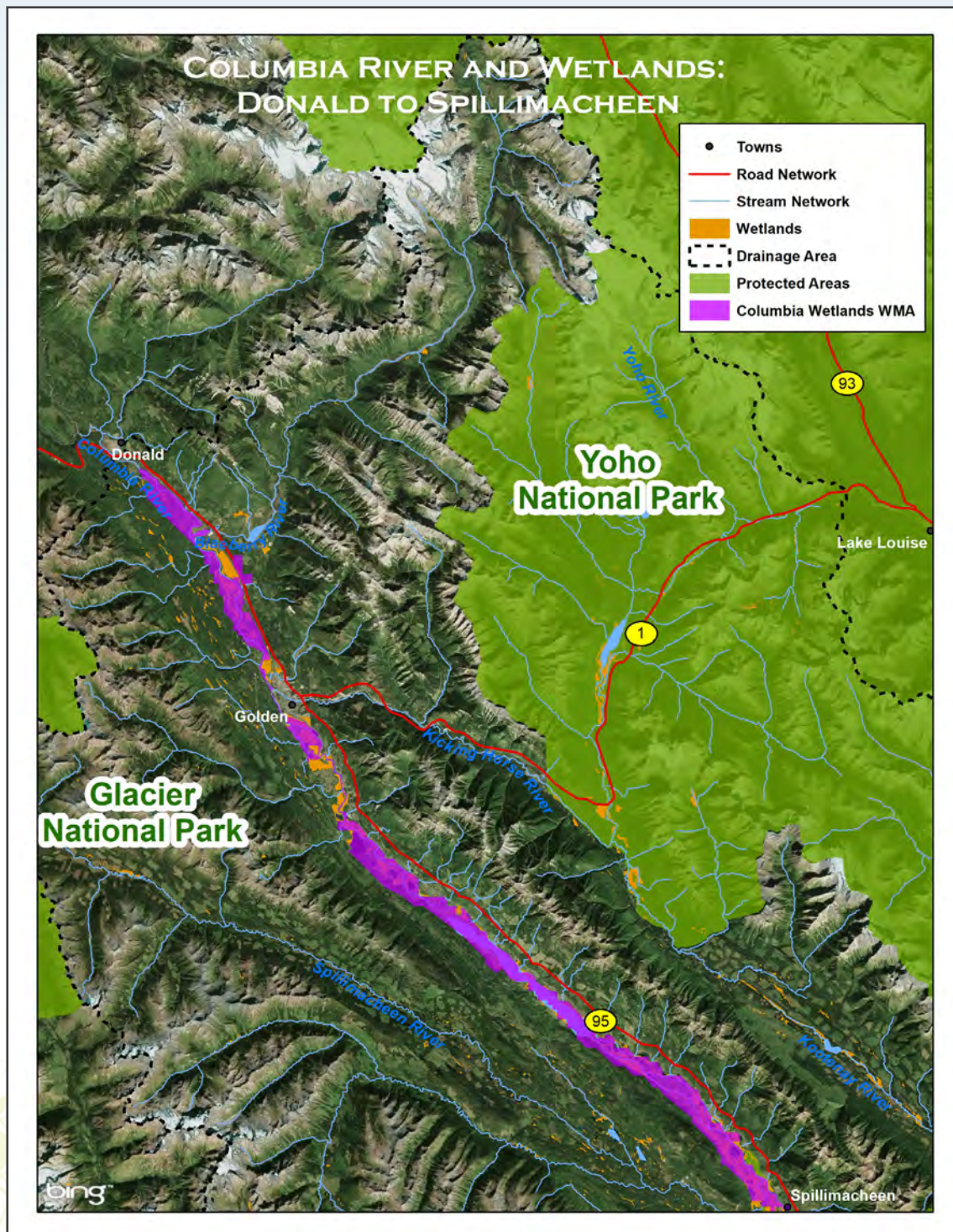


Figure 2. The section of the Columbia River and Wetlands from Donald south to Spillimacheen.

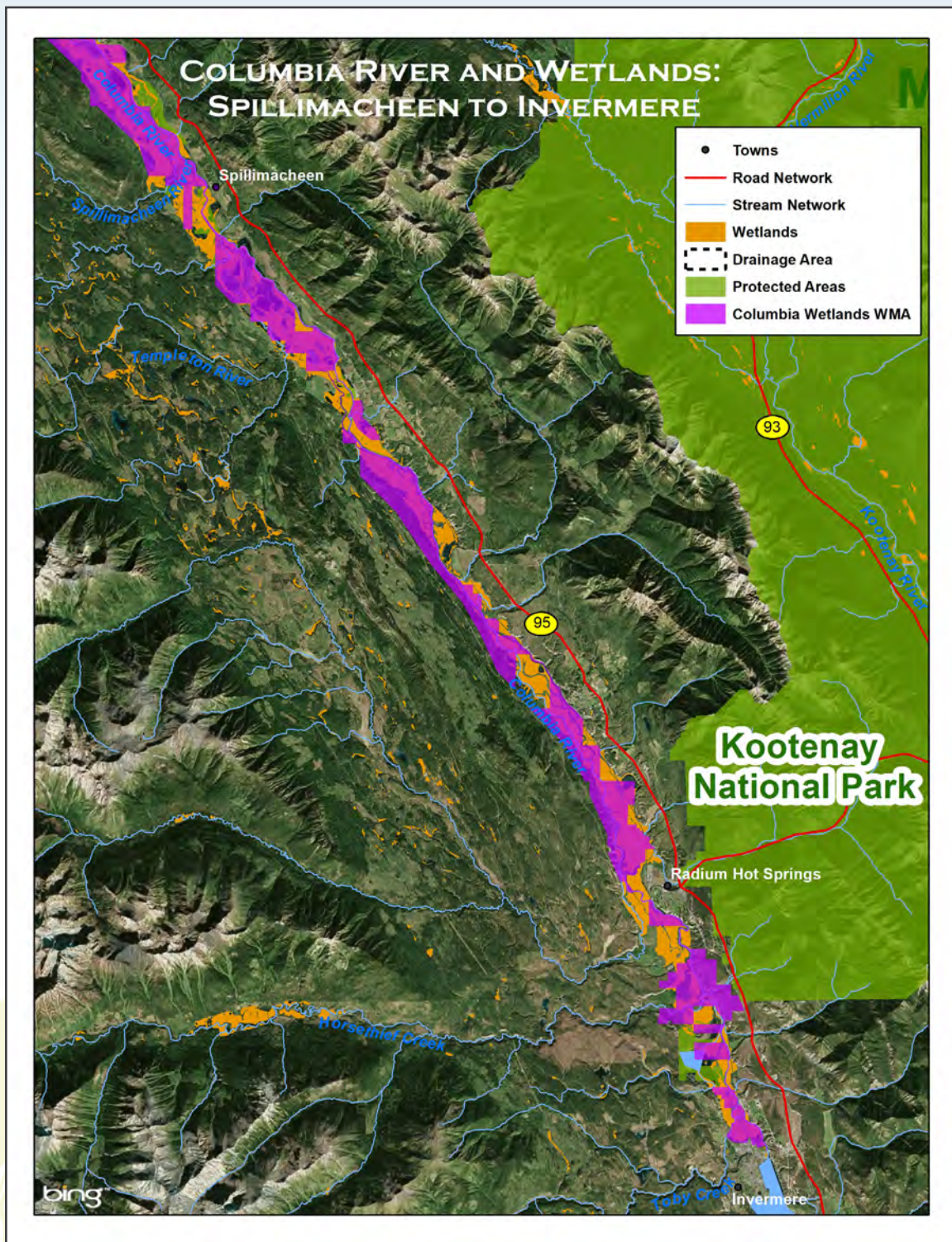


Figure 3. The section of the Columbia River and Wetlands from Spillimacheen south to Invermere.

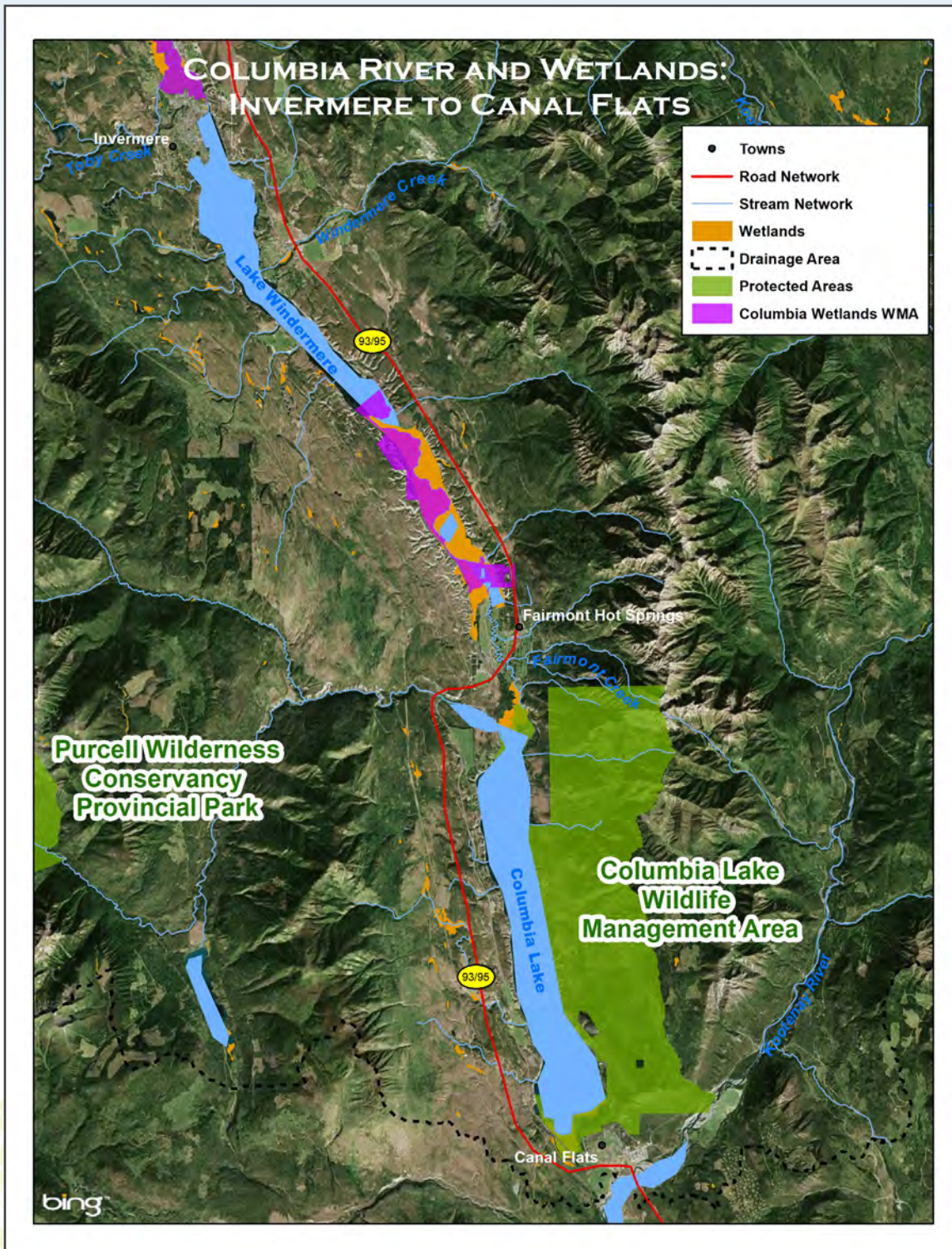


Figure 4. The section of the Columbia River and Wetlands including Lake Windermere and Columbia Lake from Invermere south to Canal Flats.

WHO WE ARE

The Columbia Wetlands Stewardship Partners⁴ was formed in 2006 to develop and promote effective stewardship and management practices for the Columbia Wetlands. We are a non-profit organization registered under the British Columbia Societies Act and a registered charity under Revenue Canada. Our partnership is dedicated to engaging the general public and working with all levels of government (municipal, provincial, federal and First Nations) to implement a shared stewardship model for the management of the upper Columbia River and adjacent Columbia Wetlands as a connected landscape.

Since CWSP's inception, the partners have invested a great deal of time and energy in ensuring that everyone in the Columbia Valley with an interest in this landscape is involved. Our partnership is made up of over 30 member groups, communities and agencies concerned with maintaining the ecological health of the Columbia Wetlands. CWSP includes various levels of federal and provincial government concerned with the wetlands, non-governmental organizations with an interest in the Upper Columbia River and associated wetlands, local First Nations, and business representatives from the tourism and forest sectors. In addition, local representatives from the communities along the wetlands include councilors and mayors from the municipalities of Canal Flats, Invermere, Radium and Golden, and representatives from the Central Kootenay and East Kootenay Regional Districts.

AS A STEWARDSHIP PARTNERSHIP, WE ENVISION:

THE UPPER COLUMBIA RIVER AND THE ADJACENT COLUMBIA WETLANDS WILL CONTINUE TO FUNCTION AS A HEALTHY FLOODPLAIN ECOSYSTEM WITH A COMPLEX BIOLOGICAL COMMUNITY GOVERNED BY NATURAL FLUVIAL AND ECOLOGICAL PROCESSES. HUMAN COMMUNITIES WILL CONTINUE TO BENEFIT SOCIALLY, ENVIRONMENTALLY AND ECONOMICALLY FROM THIS NATURALLY FUNCTIONING ECOSYSTEM AND, IN TURN, THE WETLANDS WILL CONTRIBUTE TO THE HEALTH AND VITALITY OF THE COMMUNITIES IN THE UPPER COLUMBIA RIVER BASIN. RESIDENTS IN THESE COMMUNITIES WILL BE ENGAGED AND MOTIVATED TO ADOPT A STEWARDSHIP ETHIC AND WILL WORK COLLECTIVELY, DEMONSTRATING THE BENEFITS OF A SHARED STEWARDSHIP MODEL FOR THIS IMPORTANT RESOURCE.

Over the years, our partnership has worked together to assist in the stewardship and management of this complex and often fragile Columbia Wetlands ecosystem. We have:

- Assisted in the cleanup of several old dump sites adjacent to and in the wetlands;
- Worked with various agencies to develop better public access at several sites along the Columbia River;
- Supported governments in decision-making on various issues affecting the river and wetlands, such as boating regulations for the river and wetlands with a 20hp (15kw) operating restriction for vessels operating in the main channels;
- Supported Wildsight's inventory of aquatic and terrestrial invasive plants in the ecosystem and developed strategies for dealing with them, and for educating users about how invasive species are brought into the system on boats, trailers and waders;
- Received multi-year financial support from the Regional District of East Kootenay (through the Columbia Valley Local Conservation Fund) with the goal of re-introducing/re-establishing the endangered Northern Leopard Frog to the wetlands;
- Supported Wildsight Golden to coordinate waterbird counts through the Columbia Wetlands Waterbird Survey (2015-2019), which utilized over 200 citizen-scientists; and
- Joined First Nations in the annual Columbia Salmon Festival to celebrate the role of salmon, past and present, and their potential return to the upper Columbia River system.

In 2016, CWSP began developing a strategic approach to conservation planning that would unite our various initiatives and projects. Since that time, several projects have been completed to support development of this strategic framework. To date, CWSP has:

1. Compiled a database of reports and reviewed nearly 100 management plans related to the Columbia Wetlands, including various land and water management, strategy, and action plans such as wildlife management area plans; park plans; invasive plant and pest management plans; official community plans; land use plans; and species management and recovery plans (Appendix C).
2. Identified the ecological values provided by the Columbia Wetlands ecosystem and summarized threats to its health (Tables 1 and 2).
3. Synthesized conservation goals and objectives in existing conservation and management policies and plans that apply to the Columbia Valley; identified gaps within the plans to addressing threats to the wetlands; and determined the status of plan implementation (Living Lakes Canada 2018; Appendices C and D).

Thus this strategic framework relies on the recommendations provided in previous reports and strategy sessions hosted by CWSP over the last three years. We envision this approach will foster greater internal and external collaboration, and will allow the CWSP Board of Directors and partners to better focus our efforts by identifying how issues and potential activities relate to the strategic goals discussed below. The benefits of a common road map will provide the partnership with a framework for annually tracking and reviewing our collective progress on key activities that support our mission and goals.

WHAT IS A WETLAND?

Wetlands are among the most biologically diverse and productive of all ecosystems. They serve as home to a wide range of plant and animal life, and provide an important role in the Columbia Valley's landscape and community well-being.

A wetland is a distinct ecosystem that, as the name indicates, is characterized by wet land that is inundated by water, either permanently or seasonally. Wetland ecosystems are formed where the land is saturated or flooded with water long enough that the excess water leads to conditions characterized by poorly drained soils, dominance of water-loving plants, and various kinds of biological activity which are adapted to a wet environment⁵.

The development of wetlands is a complex and dynamic interaction of climate, hydrology, chemistry, geomorphology and biology. Wetlands are not generally stable ecosystems; rather, they are constantly evolving over time (hundreds or thousands of years) as soils develop and water regimes change, resulting in ecological conditions that often contain aspects of different wetland types.

Wetlands in Canada are classified based on the Canadian System of Wetland Classification, using five classes that are differentiated by their developmental characteristics and the environment in which they exist. These five wetland classes are: bog, fen, marsh, swamp, and shallow open water. The Columbia Wetlands are a mixture of wetland classes, but are dominated primarily by marshes and shallow open water, which includes shallow Lake Windermere and Columbia Lake.

Wetlands play a number of indispensable roles, sometimes referred to as "functions" or "ecosystem services". Among their key benefits are water purification, water storage and flood control, groundwater recharge, processing and sequestering of carbon and other nutrients, stabilization of shorelines, and support of diverse plants and animals. Given present concerns about the impacts of a changing climate to our environmental and community well-being, there is growing evidence that naturally functioning wetlands are essential to mitigating the devastating effects of flooding, drought and fire caused by climate change.

WHAT MAKES THE COLUMBIA WETLANDS SO SPECIAL?

The Columbia Wetlands are one of the largest contiguous systems of floodplain wetlands in North America. The marshes and shallow open water wetlands and lakes are flooded seasonally by the Columbia River, receiving abundant sediment and nutrients that contribute to the extraordinary richness of the wetland complex. The seasonal snowmelt, summer glacial

5 Canadian System of Wetland Classification, National Wetlands Working Group 1997.

melt, and summer rains raise the water table 2.0-3.5 meters in spring and early summer; and raise the water level of Columbia Lake and Lake Windermere by as much as 1.0 meter. This water spreads out over the marshes and shallow open areas and lakes creating a diverse range of habitats with differences in soil, temperature, water clarity, vegetation and animals. The abundant sediment flowing down from the adjacent mountains makes the water turbid. The sediment is carried by the flowing water and settles out on natural levees adjacent to the main river.

The natural levees make the Columbia Wetlands incredibly unique, separating several hundred sub-basins with differing amounts of marsh, open water, riparian shrubs and floodplain forest. This is why the Columbia Wetlands are a wetland complex with many different types of wetlands sometimes joined together, sometimes separated. Without the natural variability in annual flooding – some years with high floods, some with low floods – there would not be the diverse wetland complexes we have today. There are few floodplain wetlands like those found the Columbia Wetlands remaining in developed regions of the world. Most of the wetlands have been drained for agriculture, housing developments, roads and railroads. Most of the rivers have been channelized with artificial dikes (levees or berms) confining the river to reduce the flooding.



Marshes are wetlands that occur throughout the Columbia Wetlands. They are periodically inundated by standing or slowly moving water and hence are rich in nutrients, and characterized by an emergent vegetation of reeds, rushes or sedges and the absence of woody vegetation. Shallow open water wetlands, also known as ponds or sloughs, are relatively small bodies of standing water, representing a transition stage between lakes and marshes. (Photo: Marcy Mahr)

WHAT MAKES THE COLUMBIA WETLANDS SO SPECIAL IS THAT THESE WETLANDS STILL FUNCTION AS A NATURAL, FREE-FLOWING SYSTEM.

An assessment of ownership of riparian and wetland habitat in the major floodplains in the Columbia Valley reveals that in the Upper Columbia Valley, 68% of the floodplain is secured in conservation lands, the largest being the Columbia Wetlands Wildlife Management Area⁶. This protection reinforces the importance of the province's Operational Plan for the Columbia Wetlands Wildlife Management Area to be finalized in 2019. Four of the five provincial parks in the area are zoned as "Natural Environment," and there are several private conservation properties that are managed for conservation purposes.

6 Fish & Wildlife Compensation Program, Columbia Basin Riparian and Wetlands Action Plan. Draft 2014. Pg.14.

THE COLUMBIA WETLANDS IS A WILDLIFE SANCTUARY SUPPORTING AN UNPARALLELED DIVERSITY OF 16 HABITATS, FEEDING GROUNDS FOR ELK, DEER, WOLVES, COUGARS, GRIZZLY BEARS AND OTHER WILDLIFE, AND HIGH SPECIES DIVERSITY OF FISH, REPTILES, AMPHIBIANS, AND BIRDS.

Over 260 different bird species have been identified in the Columbia Wetlands and many depend upon the wetlands to survive their journeys migrating north and south each year. This large system provides nesting and rearing habitat, with historical reports documenting as many as 10,000 swans, geese and ducks recorded in spring; 15,000 ducks in autumn; and up to 1,200 tundra swans (*Cygnus colombianus*) in single day counts. However, more recent count data has come from Wildsight Golden's Columbia Wetlands Waterbird Survey (CWWS) (2015-2019) through coordinated bird counts that survey approximately 40% of the

wetlands at numerous survey stations. CWWS's highest single day bird count to-date was documented on October 15, 2016 with 20,796 individual birds at 85 locations. CWWS's highest single day spring count was on April 16, 2018 with 19,925 individual birds ⁷.



Hooded Mergansers and a female Wood Duck (bottom right) near retreating ice during spring migration. (Photo Rachel Darvill).

The wetlands also provide important habitat for species at risk such as: bull trout (*Salvelinus confluentus*), painted turtle (*Chrysemys picta*), peregrine falcon (*Falco peregrinus*), Western Grebe (*Aechmophorus occidentalis*), Eared Grebe (*Podiceps nigricollis*), Barn Swallow (*Hirundo rustica*), Bank Swallow (*Riparia riparia*), and American badger (*Taxidea taxus*). Northern leopard frog (*Rana pipiens*) and white sturgeon (*Acipenser transmontanus*, Columbia River population) are listed as “critically

imperiled” for this area. CWSP provides financial and personnel support to the provincial Northern Leopard Frog Recovery Team in their efforts to restore a breeding population of leopard frogs to the Columbia Wetlands.

Prior to 1933, Chinook salmon (*Oncorhynchus tshawytscha*) made their way from the Pacific Ocean to the headwaters of the Columbia River, providing food for wildlife, First Nations people and early settlers. Today, fish passage along the mainstem Columbia River to the

7 https://wildsight.ca/wp-content/uploads/2016/01/Columbia-Wetlands-Waterbird-Survey_2017-Progress-Report_FINAL_Dec2017-2.pdf

headwaters is obstructed by fourteen dams. The loss of salmon has had a huge cultural, spiritual, nutritional, and economic impact on the well-being of First Nations people and the communities that depended on the fish for sustenance. The loss of salmon also means that an important food that many species depended on (including grizzly bears) has been removed from the food web. Furthermore, terrestrial and aquatic ecosystems no longer receive a pulse of nutrients when the salmon would have returned to their natal streams to spawn and die.

COLUMBIA NATIONAL WETLANDS AREA

In the late 1960s, the Canadian Wildlife Service (CWS) became interested in acquiring properties in the Columbia Valley which had high waterfowl values. By 1976, approximately 405 hectares of land had been purchased, and in 1978 those lands became the Wilmer National Wildlife Area. At this time, the Nature Trust of BC, with advice from Canadian Wildlife Service, also began acquiring properties in the Columbia Valley totaling 529 hectares at Spillimacheen, Brisco, and Harrogate. Those properties are currently leased to CWS for management, and together with the Wilmer property form the Columbia NWA.

Today, the Columbia NWA is maintained as diverse wetland habitat for the primary benefit of migrating waterfowl with secondary benefits for other wetland-dependent wildlife, fish, and plant species, especially those species considered rare, threatened, or endangered.

COLUMBIA WETLANDS WILDLIFE MANAGEMENT AREA

In 1996, the Columbia Wetlands Wildlife Management Area (CWWMA) was established under Section 4(2) of the British Columbia's Wildlife Act in order to secure the land base extending from Fairmont Hot Springs to Donald for the benefit of regionally and internationally significant fish and wildlife species and their habitats (Figs 1-4). (The wetlands between Canal Flats and Fairmont are included in the Columbia Lake Wildlife Management Area, Figure 4).

The 16,969-hectare CWWMA includes all provincial Crown lands in the wetlands. Not included in this WMA are some federal lands, the Nature Trust of BC lands (managed by the Canadian Wildlife Service), and one provincial park. The adjacent benchlands to the east of the CWWMA are almost entirely private or First Nation lands. To the west, the land is primarily Crown with some private land associated with the communities of Invermere, Athalmer, Brisco, Spillimacheen and Nicholson.

The purpose of a Wildlife Management Area is to prioritize the conservation and management of fish, wildlife and their habitats while also allowing for other compatible uses. At the time of the CWWMA's designation, an operational plan was developed for 1998-2002 (Jamieson and Hennan 1998). This first plan included goals and guiding principles that reflected public opinion concerning the wetlands and provided direction for day-to-day management decisions and actions in the CWWMA. Subsequently, that management plan was re-endorsed in 2004 for five years, expiring in 2009.

As of 2018, the BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development has been updating the management plan for the CWWMA. The current draft Vision and Goal of the Columbia Wetlands Wildlife Management Area are:

VISION

To conserve and manage fish, wildlife, their habitats and landscape connectivity so the Columbia River Wetlands will continue to function as a floodplain ecosystem with a complex biological community governed by natural fluvial and ecological processes.

GOAL

Strive to proactively manage for the natural values and habitat and to limit or mitigate negative impacts to the WMA, while seeking to understand the natural fluvial and ecological processes that influence the Columbia Wetlands WMA and to foster the ecosystems and habitats of the WMA.

CWSP has been an active participant in this process of determining the future management of the Columbia Wetlands. Partners are currently reviewing the revised Wildlife Management Plan and will be providing stakeholder consultation for the revised Plan.

COLUMBIA WETLANDS OF INTERNATIONAL IMPORTANCE

The Columbia Wetlands are internationally recognized for their diversity and variety of wildlife and as important resting and breeding habitats for waterfowl and migratory birds of the Pacific flyway. On World Environment Day in 2005, the Columbia Wetlands were officially recognized by the Ramsar Convention on Wetlands of International Importance, qualifying under all eight criteria for the designation. This Ramsar Convention – adopted in the Iranian city of Ramsar in 1971 and coming into force in 1975 – is an intergovernmental environmental treaty established by UNESCO that provides the framework for worldwide cooperation for the conservation and wise use of wetlands and their resources.

Given Wildsight's foresight to apply for Ramsar status, the Columbia Wetlands were added to the "Ramsar List" which affords national and international status with the expectation that the Columbia Wetlands would be effectively conserved and managed as a "Ramsar Site" in order to maintain its ecological character and retain its essential functions and values for future generations.

The Ramsar Convention includes various measures to respond to threats and ensures the ecological character of Ramsar Sites is preserved in order to prevent wetland loss and deterioration. For example, Article 3.1 of the Convention specifies that Contracting Parties (e.g., Canada and British Columbia) shall formulate and implement their planning so as to promote the conservation of the wetlands included in the List as well as promoting the wise use of all wetlands in their jurisdiction. Given that CWSP provides oversight for the Columbia Wetlands, it is inherent upon us to make sure government is reminded of their commitment to the Ramsar designation and operates in accordance with the current Ramsar Strategic Plan.



KTUNAXA CREATION STORY

THE KTUNAXA CREATION STORY TAKES PLACE A LONG TIME AGO. IT TAKES PLACE IN A TIME WHEN THE ANIMALS RULED THE WORLD. AND AT THIS TIME THE NIPIKA, CREATOR ... SENT OUT WORD TO ALL THE LIVING BEINGS OF THE WORLD THAT HE WANTED THEM TO COME TOGETHER IN A MEETING ... AND SO IT WAS, ALL OF THE NASUKIN, ALL OF THE CHIEFS OF ALL OF THE LIVING BEINGS OF THE WORLD, CAME TOGETHER IN THIS MEETING AND WHEN THEY WERE ALL TOGETHER NIPIKA STOOD UP IN FRONT OF THEM AND SAID, "THE REASON WHY I HAVE GATHERED YOU HERE TODAY IS I HAVE SOMETHING IMPORTANT TO TELL YOU AND I ALSO HAVE SOMETHING IMPORTANT THAT I WANT TO ASK YOU. SOON, VERY, VERY SOON THERE WILL BE ?AQƏSMAQNIK' HERE ON THE EARTH. THE ?AQƏSMAQNIK', HUMAN BEINGS, ARE COMING TO THE EARTH AND THEY WILL BE HERE VERY, VERY SOON. AND THE QUESTION THAT I HAVE FOR YOU, THE QUESTION THAT I HAVE FOR EACH AND EVERY SINGLE ONE OF YOU IS I WANT TO FIND OUT WHAT IT IS THAT YOU WILL DO FOR THE HUMAN BEINGS WHEN THEY COME TO THE EARTH. I WANT TO KNOW WHAT IT IS THAT YOU WILL OFFER TO THE HUMAN BEING WHEN THEY COME HERE TO THE EARTH."

WELL ONE OF THE FIRST NASUKIN TO STAND UP WAS ÇUPQA, CHIEF OF THE DEER. ÇUPQA STOOD UP AND SAID, "I OFFER MYSELF TO THE HUMAN BEINGS. I OFFER MY WHOLE SELF TO THE HUMAN BEINGS. I OFFER MY FLESH FOR FOOD, MY SKIN FOR CLOTHING, MY BONES AND MY ANTLERS FOR TOOLS FOR THE HUMAN BEINGS, AS LONG AS THEY SING MY SONG AND SAY MY PRAYER, I WILL ALWAYS BE THERE FOR THEM." AND SO IT WENT. THE OTHER NASUKIN STARTED TO STAND UP. THEY STARTED TO TAKE ÇUPQAS LEAD.

AT THE END OF THE KTUNAXA CREATION STORY NIPIKA THE CREATOR SAYS TO THE PEOPLE, TO THOSE ?AQƏSMAQNIKTHAT, "YOU HAVE JUST LOST A GIANT OF THE WATER AND A GIANT OF THE LAND. IT IS NOW YOUR RESPONSIBILITY TO LOOK AFTER THE WATER, TO LOOK AFTER THE LAND." AND THE ANIMALS, THE ANIMALS THEY TELL THAT STORY TO THE ?AQƏSMAQNIK, TO THE HUMAN BEINGS, AND THE HUMAN BEINGS THEY TELL THAT STORY TO THEIR CHILDREN, AND THEIR GRANDCHILDREN, AND TO THEIR CHILDREN, AND TO THEIR GRANDCHILDREN ALL THROUGH TIME.

EXCERPT FROM KTUNAXA STORYTELLER JOE PIERRE - SUSAP PI?AƏ

[HTTP://ACIP.SD79.BC.CA/TRANSCRIPTS/KTUNAXA_CREATION_STORY.PDF](http://acip.sd79.bc.ca/transcripts/ktunaxa_creation_story.pdf)

II. CONSERVATION TARGETS AND ECOLOGICAL THREATS

CONSERVATION TARGETS

Effective conservation and management of the Columbia Wetlands depends upon identifying and monitoring changes in the wetlands' biological and ecological attributes. These attributes, commonly referred to as "conservation targets", are defined as species, habitat types, wildlife habitat features, special landscape elements, and ecological processes that are important for protective action. The more than 90 conservation targets listed in Table 1 represent the biological diversity and habitats of the Columbia Wetlands ecosystem that are required to sustain its ecological integrity and healthy functioning. Table 1 is adapted from targets identified during the 2017 Columbia Valley Conservation Action Planning Forum co-sponsored by CWSP and the Kootenay Conservation Program (Mahr 2018) and CWSP's 2016 Annual General Meeting. This list focuses on valley bottom wetlands and adjacent upland habitats important for wildlife requiring diverse habitats, moving cross-valley, and/or shifting their range due to climate change. Although the targets are listed independently, they are intrinsically interconnected, i.e., habitat features may be embedded in particular habitat types or may be the result of certain ecological processes. Moreover, several conservation targets may be negatively impacted by the same threat.

ECOLOGICAL THREATS

"Threats" are defined as negative impacts which may significantly stress conservation targets and directly impair species viability, habitat quality, or ecological functioning. The 47 impacts listed in Table 2 are activities or processes that are causing (or may cause) the destruction, degradation and/or impairment of one or more of the identified conservation targets of the Columbia Wetlands (Table 1). The list of ecological threats in Table 2 is informed by the 2017 Columbia Valley Conservation Action Planning Forum (Mahr 2018) and CWSP's 2016 Annual General Meeting. Many, and likely all, of the conservation targets will face combined stresses. The cumulative effects of current and emerging physical and biological stressors can have a profound impact on the ecological functions of the Columbia Wetlands and its adjacent landscape. Cumulative impacts are difficult to quantify and even more difficult to predict. Therefore, CWSP recommends a precautionary approach to management and further human development in order to minimize the non-climate related stressors on conservation values.

Given that a changing climate adds a new dimension of threats, conservation actions must take into account changing temperature and precipitation that will disrupt habitats, move species home ranges, bring diseases, and change hydrologic patterns. Thus we have to respond to existing impacts as well as plan for the anticipated threats from climate change.

TABLE 1. CONSERVATION TARGETS FOR THE COLUMBIA WETLANDS ECOSYSTEM⁸

Species of interest and conservation concern	Important habitat types	Special habitat features	Ecological processes
• American Badger • Grizzly Bear • Wolverine • Rocky Mountain Bighorn Sheep • Mountain Goat • Rocky Mountain Elk • Moose • Mule Deer • Muskrat • American Beaver • Porcupine • Northern pocket gopher • Little Brown Myotis • Northern Myotis • Yuma Myotis • Big Brown Bat • Townsend's Long-eared Bat • Silver-haired Bat • Lewis's Woodpecker • American Bittern • Sandhill Crane • Great Blue Heron • Bobolink • Western Screech-Owl • Long-billed Curlew • Swallows (all) • Western, Horned, Eared, Pied-billed Grebes • Sora • Flammulated Owl • Short-eared Owl • Peregrine Falcon • Sharp-tailed Grouse (reintroduction) • Common Nighthawk • Western Painted Turtles • Rubber Boa • Northern Leopard Frog • Western Toad • Native bees • Bull Trout • Burbot • White Sturgeon • Westslope Cutthroat • Kokanee • Chinook Salmon • Sculpin • Dace • Freshwater mussels • Limber Pine • Rare plants (e.g., <i>Hooker's townsendia</i>) • Traditionally important plants (bitterroot, balsamroot, highbush cranberry, wapato)	• Wetlands (e.g., vulnerable types at risk due to changes in hydrology, emergent vegetation, large shallow open water) • Alluvial fans at creek mouths • Mature riparian cottonwood & spruce-cottonwood forest • Grassland & open forest • Low elevation mature & old growth Douglas-fir forest • Mature aspen • Alpine & high elevation grasslands • Lakes & Ponds • Lake foreshore • Groundwater-surface water interface (warm water spring; cold water source)	• Fish spawning bed • Mainstem spawning habitat • Fish feeding/rearing areas • Nesting and/or roosting site • Migratory stopover site • Burrows or denning area • Ungulate winter range • Bat hibernaculum (old mines, rock caves, surrounding forest) • Abandoned buildings • Steep-sided slopes/Clay banks • Mineral Lick • Wildlife tree • Perched ponds* • Climax grassland • Wildlife corridors • Ice field/glacier • Calcareous rock/soils • Rocky outcrops • Rock cave	• Hydrologic processes (filtering, recharge, flooding, storage) • Nutrient dynamics • Carbon sequestration • Wildlife movement & migration • Predator-prey dynamics • Stand maintain fires • Natural vegetation succession • Breeding & nesting • Fish spawning & rearing • Fish over-wintering • Beaver-wetland creation • Geomorphological processes (erosion, levees, sedimentation, large woody debris, gravel)

* Ponds in the floodplain that do not always receive floodwaters every year but retain standing water over winter (also called naturally impounded ponds).

TABLE 2. ECOLOGICAL THREATS TO THE COLUMBIA WETLANDS ECOSYSTEM⁹

Direct loss, modification or impairment of habitats & species	• Major commercial or residential development/urban sprawl • Conifer encroachment on native grassland • Extensive logging and road building • Barriers to wildlife connectivity and passage • Fire and fire suppression • Mining and gravel extraction • Erosion and sedimentation • Loss of large woody debris, gravel, rocks and sediment due to climate change and human activity • Agricultural expansion and/or intensification • Over-grazing or poor range management • Unsustainable harvesting of native species and poaching (e.g., aquatic vegetation, fish and wildlife, native plants) • Harvesting and falling of wildlife trees • Natural system modification (water diversions, illegal water withdrawals, dams, groynes, docks) • Declining water quality • Persecution and extermination of wildlife • Mine closures and disturbance to natural caves (providing bat hibernacula) • Use of <i>Bacillus thuringiensis</i> subsp. <i>israelensis</i> (Bti) for mosquito control • Herbicide/pesticide run-off
Transportation & utilities	• Transportation corridors • Hydroelectric power line corridors • CP Rail railway line, bridges and barriers • Wildlife collisions on transportation corridors – highways, railways, transmission lines
Invasive species	• Zebra and quagga mussels • Invasive plants (e.g., leafy spurge, black henbane, perennial pepperweed, purple loosestrife) • American bullfrog • Chytrid fungus (infecting amphibians) • Non-native fish (e.g., largemouth bass, yellow perch) • Fungus causing white-nose syndrome (infecting hibernating bats) • Domestic sheep diseases (infecting native bighorn sheep) • Increased spread in human-developed linear corridors (e.g., roads, utility lines, trails)
Recreational pressure & human use	• Increased trail and off-trail usage of motorized and mechanically assisted recreational vehicles and mountain bikes • Increased new and unauthorized trail building • Increased motorized watercraft on lakes • Increased human activity in the wetlands and human-wildlife interactions • Increased presence of planes, drones, helicopters
Impact of climate: current & future	• Vegetational changes/habitat shifting • Changing species distributions • Catastrophic fire • Hydrological changes (causing floods or extreme drought) • Changes in typical flood pulse and associated sediment pulse • Changes in erosion and deposition of sediment affecting levees • Mudslides/landslides • Loss of snowpack/loss of cold-water creeks • Forest pest spread (e.g., mountain pine beetle and other insects) • Wildlife disease spread • Water impoundments and other water storage may affect hydrology
Cumulative effects	• Impact of the combinations of multiple threats

9 http://kootenayconservation.ca/wp-content/uploads/Columbia-Valley-Conservation-Action-Forum-Summary-Report-FINAL_20Dec2017.pdf

III. CONSERVATION PRIORITIES, GAPS AND OPPORTUNITIES

CONSERVATION PRIORITIES

Priority issues, knowledge gaps, and areas for action have been emphasized in CWSP reports and activities leading up to the development of CWSP'S Strategic Framework. Priorities can be broken down into the following categories:

HYDROLOGY

The lack of data on the streamflow of the Upper Columbia River and the Columbia Wetlands is a critical impediment to understanding the wetland water regime, including information about minimum flow requirements to maintain wetland ecosystems. This lack of data includes the contribution to the Columbia River made by drainage from Lake Windermere and Columbia Lake. Other concerns include lack of data on snowpack, glacial mass balance, groundwater resources, and hydrologic changes under climate change. There is growing urgency to be able to protect, monitor and mitigate decreases in hydrologic inflows to the two lakes, river and wetlands. Other concerns relate to potential changes to peak flows in the wetlands, and the depth and spread of water across the floodplain.

WATER QUALITY

There is a general lack of water quality data for the Columbia Wetlands and the upper Columbia River, although several lakes within the Columbia Valley have received considerable attention. Maintaining good water quality has been highlighted as a regional concern, and threats to that quality have been identified. Threats include non-point sources such as the deposition of atmospheric contaminants, herbicide and pesticide runoff, drainage of oil and grease from parking lots, the contribution of de-icing and dust control, salts and excess nutrient from agricultural lands and wastewater disposal. Other concerns include the sources and levels of pharmaceuticals and other introduced compounds. These threats appear to be increasing in those areas of the lakes-river-wetland system where development pressure and human use is increasing (e.g., along the shoreline of Lake Windermere and Columbia Lake.)

CLIMATE CHANGE

Despite growing concerns about the uncertainty of climate change impacts and the implications to wetland ecosystem function, riparian habitat and wetland-dependent species, there is a significant lack of data on biophysical indicators that could indicate climate change effects within the Columbia Wetlands. Potential effects include: changing species distribution, catastrophic fire, vegetation changes, habitat shifts, hydrologic changes (due to differences in the timing of spring runoff and extreme events such as flash floods and extreme drought), mudslides, landslides, loss of snowpack, loss of cold-water creeks, forest pest spread, wildlife disease spread, and how water impoundments and other water storage may affect hydrology.

An increase in regional wildfires is a consequence of climate change. Improving our understanding of wildfires (and fire suppression) has been identified as important. Although

there is a lack of data on fire in the wetlands and its impact on wetland ecosystems, there is evidence that wildfires in terrestrial systems can affect hydrologic processes by increasing peak flows, increasing sedimentation, and decreasing channel stability.

CONNECTIVITY

Threats to several types of ecological connectivity have been identified by CWSP and others, such as: a) connectivity concerning the geomorphology of the river, and b) connectivity relating to wildlife habitat and movement corridors. Critical geomorphic and hydrologic processes drive the presence of riparian and wetland habitat in the Columbia Wetlands. Potential threats to river connectivity and geomorphological processes include: mining and gravel extraction; erosion and sedimentation; modification caused by railways and railyards; loss of large woody debris, gravel, rocks and sediment due to climate change and human activity; modification to natural hydrologic systems through water diversions, canals, dams, water management, groynes and docks; and sustaining lake levels to protect riparian areas along shorelines.

Concerns over wildlife habitat connectivity center on wetland-specific habitat linkages and habitat fragmentation. Threats to wildlife corridors include transportation corridors and hydro lines, and wildlife collisions on transportation corridors such as: highways, railways and transmission lines. Enhancing habitat connectivity and wildlife corridors throughout the Columbia Wetlands is a regional priority for conservation action.

RECREATION PRESSURE

The CWSP has identified threats to wildlife and habitats associated with recreation conducted in an unsustainable manner. The range of threats to the Columbia Wetlands caused by an increase in outdoor recreation include: trail and off trail use (motorized, mechanically assisted, and non-motorized); new and unauthorized trail building; motorized watercraft on lakes and damage to riparian habitat from motor craft that create excessive wake; human activity in the wetlands; recreational developments along the shorelines of Lake Windermere and Columbia Lake; and presence of drones, planes and helicopters.

HUMAN DEVELOPMENT PRESSURE

Human development pressures vary across the Columbia Wetlands and are widely acknowledged as a regional concern. Portions of the wetlands are susceptible to on-site development, while others are more vulnerable to activities on adjacent uplands that can disrupt wetland hydrology. Specific threats include: extensive logging and road building; major commercial, residential and recreational development; urban sprawl; agricultural expansion or intensification; overgrazing or poor range management; unsustainable harvesting of native species and poaching (aquatic vegetation, fish and wildlife, native plants); harvesting and felling of wildlife trees; and persecution and extermination of wildlife. Many of these threats have both short- and long-term effects on wetland and riparian landscapes, and impact habitat connectivity. Natural disturbances, when combined with

human activities such as water withdrawals and poor agricultural practices, can negatively impact levees and the persistence of cottonwoods, and increase the threat of wildfires within dry wetlands and riparian areas. In addition, human discomfort from mosquitoes had lead to a mosquito control program using a pesticide called *Bacillus thuringiensis israelensis* (Bti), which can lead to indirect effects through food web interactions.

KNOWLEDGE GAPS: CWSP RESOURCE DATABASE

Several recurring themes have emerged through the evaluation of documents within CWSP's Resource Database (Appendix C). The following list, roughly grouped and not ranked, reflects the most frequently mentioned knowledge gaps and recommendations for what is needed to better understand and manage the Columbia Wetlands.

HYDROLOGIC

- Water quality data for the Columbia Wetlands and Upper Columbia River
- Streamflow data for the Upper Columbia River and the wetland water regime, including minimum and peak flow requirements for wetland ecosystem maintenance and as supported by drainage from Lake Windermere and Columbia Lake to the Columbia River
- Regional groundwater resource mapping and protection to maintain groundwater discharge areas as a source of cold water and recharge
- Implications of climate change to wetland ecosystem function
- Critical geomorphic and hydrologic processes that drive the presence of riparian habitat and the causes of its loss

SPECIES AND HABITATS

- Mapped riparian and wetland habitats
- Inventoried aquatic and terrestrial plants, and plant communities at risk in the wetlands
- Status of cottonwood habitat in the wetlands
- Wetland-specific connectivity or habitat fragmentation
- Beaver and muskrat as agents of change
- Freshwater biodiversity
- Implications of the increase or decrease of kokanee in the system
- At-risk bird inventory, sensitive or critical habitat, and population status
- At-risk amphibian inventory, sensitive or critical habitat, and population status
- At-risk fish inventory, sensitive or critical habitat, and population status
- Game fish inventories, spawning data and abundance
- Changes to tributary streams (as habitat and inputs to wetlands)
- Seasonal use of wetland and riparian habitat by grizzly bears and other large mammals
- Identification and impact of both aquatic and terrestrial invasive species
- Identification and protection of existing high quality habitats

Within some of the previous categories, filling one or two key data gaps would begin to address the issue. Identifying these core data needs over the next five years would help CWSP achieve strategic objectives for conservation and restoration. For example, wetland-specific concerns about climate change center on the implications to wetland ecosystem function, riparian habitat, wetland-dependent species, and identifying long-term trends in wetland composition and distribution.

These concerns could at least be partially addressed by responding to the specific need for data on biophysical indicators that could indicate climate change within the wetlands. Filling these gaps would allow the identification of wetland types that are more sensitive to disturbance or provide greater wildlife habitat value than others. The need to identify and map wetland ecosystems and associated threats was also suggested in CWSP's review of local and regional management plans.



Spring training session for Columbia Wetlands Waterbird Survey volunteers at the Columbia National Wildlife Area (Wilmer Unit), located within the Columbia Wetlands ecosystem. (Photo: Rachel Darvill)

In terms of wetland hydrology, lack of data and monitoring for streamflow of the Upper Columbia River, Columbia Wetlands and the outflow from Lake Windermere and Columbia Lake was recognized as a critical impediment to understanding the wetland water regime. Collecting flow data could partially address the need to understand the hydrologic processes that drive the presence of riparian habitat and the causes of its loss, hydrologic changes under climate change, and human modification to natural hydrologic regimes.

UNDERSTANDING THE IMPACTS OF BOTH AQUATIC AND TERRESTRIAL INVASIVE SPECIES IS IMPORTANT TO PROTECTING THE NATIVE BIOTA AND NATURAL FUNCTIONS OF THE COLUMBIA WETLANDS.

PRESSING THREATS INCLUDE: POTENTIAL INTRODUCTION OF ZEBRA AND QUAGGA MUSSELS; INVASIVE PLANTS; AMERICAN BULLFROG; NON-NATIVE FISH; EXOTIC FUNGI SUCH AS CHYTRID AFFECTING AMPHIBIANS AND WHITE-NOSE SYNDROME AFFECTING HIBERNATING BATS; AND THE POTENTIAL IMPACT OF DOMESTIC SHEEP DISEASES.

Currently, there are gaps in knowledge about wetland plants and plant communities that are at-risk, the status of cottonwoods and cottonwood habitat, as well as sensitive or critical habitat for at-risk birds, amphibians and fish.

We also lack information on the population trends, distribution, and conservation status of at-risk species birds, amphibians and fish, including game fish. There is also a need to investigate the status of fish and wildlife that are critical to maintaining habitat (e.g., muskrat, beaver) or altering the nutrient status of the wetlands (e.g., kokanee).



With Chinook salmon absent from the Upper Columbia River for more than 75 years, other fish have taken over that habitat. (Photo: William Perry)

WHEN IT COMES TO THE RE-INTRODUCTION OF SPECIES SUCH AS CHINOOK SALMON, WE OFTEN LOOK AT THE BENEFITS SUCH AS THE RETURN OF A FOOD SOURCE, NUTRIENTS AND CULTURAL VALUES. HOWEVER, WE ALSO NEED TO ASK, IS THE HABITAT AVAILABLE? WHAT ARE THE CHALLENGES TO REINTRODUCTION?

In the case of the Chinook, which have been absent from the Upper Columbia River for more than 75 years, some of their habitat is now occupied by other fish species. Examples include bull trout, kokanee, bass, perch and some invasive species. Some of these species (e.g., bass, perch) may be capable of being significant predators on young Chinook fry. Urbanization, agriculture, timber harvesting and transportation (both roads and railways) have impacted stream flows and placed barriers to spawning and rearing areas. With climate change, even the modest scenarios for the Columbia Valley indicate elevated water temperatures for lakes and streams.

For cold water species like Chinook, their successful migration, spawning and rearing will depend upon cold headwaters of the Upper Columbia River system that may over time be critically important for the maintenance of Chinook metapopulations within the larger Columbia River system. The same holds true for the long-term viability of kokanee, westslope cutthroat, rainbow trout and bull trout, which also prefer cooler temperature water.

IV. A CONSERVATION STRATEGY FOR THE COLUMBIA WETLANDS

The Columbia Wetlands Stewardship Partnership intends for this framework to inspire and encourage our partnership to work cooperatively towards achieving common goals and addressing common threats in order to improve the overall ecological health of the wetlands.

VISION

The Upper Columbia River and the adjacent Columbia Wetlands will continue to function as a healthy floodplain ecosystem with a complex biological community governed by natural fluvial and ecological processes. Human communities will continue to benefit socially, environmentally, and economically from this naturally functioning ecosystem and, in turn, the wetlands will contribute to the health and vitality of the communities in the upper Columbia River Basin. Residents in these communities will become engaged and motivated to adopt a stewardship ethic and will work collectively to demonstrate the benefits of a shared stewardship model for this important resource.

MISSION

The Columbia Wetlands Stewardship Partners is made up of a diverse group of community interests, First Nations and government agencies created to develop effective stewardship and management practices for the Columbia Wetlands and the Upper Columbia River. The partnership, acting on their vision statement, will engage the general public and work with governments at all levels to implement a shared stewardship model for the management of the river and wetlands.

MANDATE

The mandate of the Columbia Wetlands Stewardship Partners is to steward the wetlands in accordance with our vision as a single system, irrespective of ownership or jurisdiction, and to take a proactive stance in dealing with issues as they arise. We intend to take a positive, community and science-based approach to issues related to the wetlands, and resolve issues neighbour to neighbour. The formation of this group is guided by local people taking responsibility for a natural landscape they care deeply about.

OUR GUIDING PRINCIPLES

Our strategy is underpinned by six core principles, which establish important concepts, values and approaches that form the basis of effective wetland conservation. These principles are as follows:

1. Wetlands are integral components of their watersheds, natural heritage and hydrologic systems, and part of the larger landscape and global climate system.
2. Wetlands and their functions provide important benefits vital to the health and well-being of all life in the Upper Columbia Valley, and improve the region's resilience to climate change.
3. Wetlands should be conserved based on three hierarchical priorities:
 - Protect – retain area and functions of existing wetlands,
 - Mitigate – minimize any further damage to wetlands, and
 - Restore – improve and re-establish wetland area and function on the landscape.
4. Wetlands should be conserved based on a precautionary approach and using the best available science, information and traditional ecological knowledge.
5. Conservation of all wetlands and their functions is important and should occur in a manner that recognizes and is informed by the interests of local communities.
6. Wetlands should be conserved in strong partnership with all levels of government, Indigenous peoples, local public sector agencies, private landowners, the agricultural community, industry, non-government organizations, and others involved in wetland conservation.

GOALS AND OUTCOMES

This Columbia Wetlands Conservation Action Framework is based on strategic directions that reflect the key roles, responsibilities and services CWSP provides in order to conserve and steward this important wetland ecosystem. CWSP's five strategic directions are: partnership, awareness, research, stewardship, and management (Figure 5).

Each strategic direction is supported by a long-term goal and desired outcome to focus efforts, provides aspirations for achievement, and establishes a flexible framework through which to plan and implement actions that benefit the conservation and management of the Columbia Wetlands. The five strategic directions, with their goals and outcomes, are discussed below. As we move forward on implementation, we will look for how our work is complementary to other local, regional, provincial, national and international initiatives (Appendix B).



AWARENESS	RESEARCH	STEWARDSHIP	MANAGEMENT	PARTNERSHIP
Goal: Develop and inspire public awareness of and connection to the Columbia Wetlands as essential for maintaining environmental well-being and quality of life in the Columbia Valley. Outcome: People are aware of the intrinsic values of the Columbia Wetlands and take steps to conserve and use it sustainably because they understand wetlands provide critical habitat and essential services for a healthy environment and community.	Goal: Initiate and support increasing scientific and traditional knowledge about the Columbia Wetlands through applied research and monitoring that focuses on their status, biological diversity, traditional uses, functions and vulnerability. Outcome: Better knowledge is available and used to make informed decisions to improve wetland management, conservation and sustainable use.	Goal: Encourage and support stewardship activities and practices that positively contribute to sustaining the biological diversity and ecological integrity of the Columbia Wetlands. Outcome: Increased coordination and collaboration among CWSP's partners to deliver stewardship activities that conserve wetland habitats and associated species, and prevent the loss of wetlands.	Goal: Support local, provincial, national and global strategies and management objectives that address conservation of the Columbia Wetlands to reduce its vulnerability, enhance its ecological functioning over time, and ensure its ecological significance in a global context. Outcome: CWSP effectively engages with all levels of government and other management authorities to prioritize the Columbia Wetlands for conservation and restoration in order to prevent the degradation or loss of wetlands and associated species.	Goal: Strengthen partnerships by encouraging a focused and integrated approach to managing and conserving the Columbia Wetlands. Outcome: Local residents, communities, organizations and all levels of government collaborate and effectively work together to improve management and conservation of the Columbia Wetlands.

Figure 5. Graphic with the five strategic directions, goals and outcomes that will guide the Columbia Wetlands Stewardship Partners for 2020-2025.

1. STRATEGIC DIRECTION – AWARENESS

AWARENESS GOAL: DEVELOP AND INSPIRE PUBLIC AWARENESS OF AND CONNECTION TO THE COLUMBIA WETLANDS AS ESSENTIAL FOR MAINTAINING ENVIRONMENTAL WELL-BEING AND QUALITY OF LIFE IN THE COLUMBIA VALLEY.

OUTCOME: PEOPLE ARE AWARE OF THE INTRINSIC VALUES OF THE COLUMBIA WETLANDS AND TAKE STEPS TO CONSERVE AND USE IT SUSTAINABLY BECAUSE THEY UNDERSTAND WETLANDS PROVIDE CRITICAL HABITAT AND ESSENTIAL SERVICES FOR A HEALTHY ENVIRONMENT AND COMMUNITY.

ACTIONS

- 2.1. Work with partners and stakeholders to develop public education and outreach initiatives about the wetlands and their importance to encourage the long-term stewardship and protection of the wetlands.
- 2.2. Design a media strategy to raise the profile of the Columbia Wetlands and share research findings and stewardship successes.
- 2.3. Place signage at key public access locations as described by the Ramsar Standing Committee to let people know they are entering an internally recognized wetland – a designated Ramsar Site – and to avoid any activities inconsistent with its preservation.
- 2.4. Continue to support international partnerships that raise awareness of the importance of the Columbia Wetlands in the broader landscape (e.g., Ramsar Convention, North American Waterfowl Management Plan, Canadian Intermountain Joint Venture, Important Bird and Biodiversity Areas, etc.).
- 2.5. Facilitate opportunities for public stewardship and citizen science to be incorporated into Research and Stewardship projects.
- 2.6. Incorporate Indigenous knowledge and practices into public outreach and communications about the importance of wetlands for biodiversity and traditional food and medicine.

2. STRATEGIC DIRECTION – RESEARCH

RESEARCH GOAL: INITIATE AND SUPPORT INCREASING SCIENTIFIC AND TRADITIONAL KNOWLEDGE ABOUT THE COLUMBIA WETLANDS THROUGH APPLIED RESEARCH AND MONITORING THAT FOCUSES ON THEIR STATUS, BIOLOGICAL DIVERSITY, TRADITIONAL USES, FUNCTIONS AND VULNERABILITY.

OUTCOME: BETTER KNOWLEDGE IS AVAILABLE AND USED TO MAKE INFORMED DECISIONS TO IMPROVE WETLAND MANAGEMENT, CONSERVATION AND SUSTAINABLE USE.

ACTIONS

- 3.1. Map and characterize the vegetation communities in different wetland basins.
- 3.2. Conduct monitoring of hydrologic flows as needed to develop a hydrologic budget of the Columbia Wetlands and associated lakes.
- 3.3. Determine the hydrologic vulnerability of the wetlands to climate change by supporting research into understanding and quantifying how wetlands are responding to climate change (e.g., changes to their hydrologic functions, changes in their role to act as carbon sinks or sources, and changes in their role to support aquatic and terrestrial habitats and species).
- 3.4. Support mapping and assessment of ecologically significant groundwater recharge areas and discharge to wetlands and lakes to provide information on water balances and sustainability.
- 3.5. Analyze geomorphological processes associated with levees, alluvial fans and tributaries.
- 3.6. Assess tributary creeks and riparian areas along creeks for their health and ability to support fish and wildlife
- 3.7. Map hydrology of wetland communities to determine which wetlands most likely to lose water needed for SAR
- 3.8. Identify wetland and riparian locations of critical connectivity corridors for landscape-scale SAR
- 3.9. Identify high-quality wetland habitats that benefit a suite of species of interest and conservation concern; inventory and map locations.
- 3.10. Promote research and monitoring on birds, fish and wildlife that have a high profile (e.g., elk, beaver, moose) and on species at risk and species of concern, such as northern leopard frogs, painted turtles, bats, swallows and others.
- 3.11. Conduct periodic monitoring for invasive plants, animals and pathogens in the wetlands.
- 3.12. Determine if human use is affecting wildlife including breeding birds in the heavily used reaches of the Columbia Wetlands and Lake Windermere and Columbia Lake.
- 3.13. Monitor fish populations and spawning locations of species such as burbot, bull trout, rainbow trout, cutthroat trout and kokanee to assess whether populations are increasing or decreasing.
- 3.14. Characterize and summarize cumulative effects on the Columbia Wetlands to create an inventory of all of the factors influencing to the current and future health of the Columbia River and Wetland system.
- 3.15. Pursue research of indigenous ecological knowledge, historic use and stewardship, and cultural significance of wetlands to First Nations.

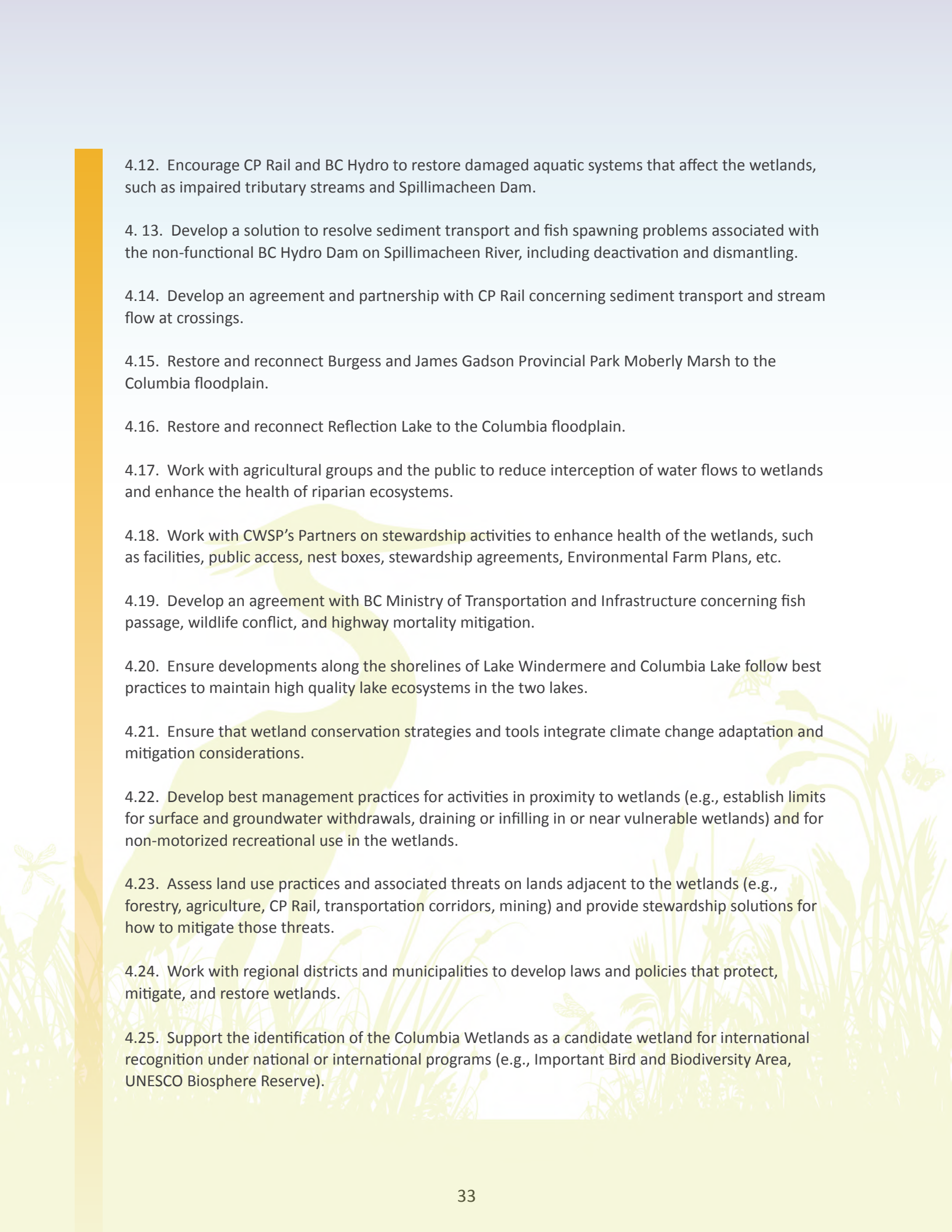
3. STRATEGIC DIRECTION – STEWARDSHIP

STEWARDSHIP GOAL: ENCOURAGE AND SUPPORT STEWARDSHIP ACTIVITIES AND PRACTICES THAT POSITIVELY CONTRIBUTE TO SUSTAINING THE BIOLOGICAL DIVERSITY AND ECOLOGICAL INTEGRITY OF THE COLUMBIA WETLANDS.

OUTCOME: INCREASED COORDINATION AND COLLABORATION AMONG CWSP'S PARTNERS TO DELIVER STEWARDSHIP ACTIVITIES THAT CONSERVE WETLAND HABITATS AND ASSOCIATED SPECIES, AND PREVENT THE LOSS OF WETLANDS.

ACTIONS

- 4.1. Establish a framework for determining priority areas and focusing efforts for conservation and restoration that consider the broader landscape context and provincial commitments (e.g., wetland loss, habitat connectivity, natural heritage systems, mitigation and adaptation to climate change).
- 4.2. Inventory, assess and plan conservation actions for SAR in the wetland & riparian habitats in the Columbia Wetlands.
- 4.3. Develop management options to retain water in selected wetlands including those that are no longer connected to the natural system and are vulnerable to draining due to climate change, drought or beavers.
- 4.4. Work to enhance black cottonwood stand maintenance, restoration and recruitment.
- 4.5. Continue to support, encourage and promote stewardship of wetlands on private lands (e.g., Environmental Farm Plan, Farmland Advantage, Columbia Valley Local Conservation Fund).
- 4.6. Continue to support and encourage indigenous ecological knowledge, historic use and stewardship, and cultural significance of wetlands to First Nations.
- 4.7. Update Memorandum of Understandings with Agencies that have fiduciary responsibilities and accountabilities; include state of the Columbia Wetlands report.
- 4.8. Analyze and describe practical opportunities for public and private sectors to undertake wetland conservation projects; include development and communication of best management practices, including Indigenous-led conservation efforts.
- 4.9. Encourage the development of multi-ecosystem (e.g., wetland, grassland, open forest) stewardship plans.
- 4.10. Work with the provincial government to implement a Provincial Wetlands Strategy in support of the Wetlands Action Plan for BC.
- 4.11. Restore the most critical tributary streams that have been identified as damaged through CWSP research.

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- 4.12. Encourage CP Rail and BC Hydro to restore damaged aquatic systems that affect the wetlands, such as impaired tributary streams and Spillimacheen Dam.
- 4.13. Develop a solution to resolve sediment transport and fish spawning problems associated with the non-functional BC Hydro Dam on Spillimacheen River, including deactivation and dismantling.
- 4.14. Develop an agreement and partnership with CP Rail concerning sediment transport and stream flow at crossings.
- 4.15. Restore and reconnect Burgess and James Gadson Provincial Park Moberly Marsh to the Columbia floodplain.
- 4.16. Restore and reconnect Reflection Lake to the Columbia floodplain.
- 4.17. Work with agricultural groups and the public to reduce interception of water flows to wetlands and enhance the health of riparian ecosystems.
- 4.18. Work with CWSP's Partners on stewardship activities to enhance health of the wetlands, such as facilities, public access, nest boxes, stewardship agreements, Environmental Farm Plans, etc.
- 4.19. Develop an agreement with BC Ministry of Transportation and Infrastructure concerning fish passage, wildlife conflict, and highway mortality mitigation.
- 4.20. Ensure developments along the shorelines of Lake Windermere and Columbia Lake follow best practices to maintain high quality lake ecosystems in the two lakes.
- 4.21. Ensure that wetland conservation strategies and tools integrate climate change adaptation and mitigation considerations.
- 4.22. Develop best management practices for activities in proximity to wetlands (e.g., establish limits for surface and groundwater withdrawals, draining or infilling in or near vulnerable wetlands) and for non-motorized recreational use in the wetlands.
- 4.23. Assess land use practices and associated threats on lands adjacent to the wetlands (e.g., forestry, agriculture, CP Rail, transportation corridors, mining) and provide stewardship solutions for how to mitigate those threats.
- 4.24. Work with regional districts and municipalities to develop laws and policies that protect, mitigate, and restore wetlands.
- 4.25. Support the identification of the Columbia Wetlands as a candidate wetland for international recognition under national or international programs (e.g., Important Bird and Biodiversity Area, UNESCO Biosphere Reserve).

4. STRATEGIC DIRECTION – MANAGEMENT

MANAGEMENT GOAL: SUPPORT LOCAL, PROVINCIAL, NATIONAL AND GLOBAL STRATEGIES AND MANAGEMENT OBJECTIVES THAT ADDRESS CONSERVATION OF THE COLUMBIA WETLANDS TO REDUCE ITS VULNERABILITY, ENHANCE ITS ECOLOGICAL FUNCTIONING OVER TIME, AND ENSURE ITS ECOLOGICAL SIGNIFICANCE IN A GLOBAL CONTEXT.

OUTCOME: CWSP EFFECTIVELY ENGAGES WITH ALL LEVELS OF GOVERNMENT AND OTHER MANAGEMENT AUTHORITIES TO PRIORITIZE THE COLUMBIA WETLANDS FOR CONSERVATION AND RESTORATION IN ORDER TO PREVENT THE DEGRADATION OR LOSS OF WETLANDS AND ASSOCIATED SPECIES.

ACTIONS

- 5.1. Determine the effectiveness of existing management plans and legislation for mitigating current and future threats to the wetlands, and assist governments and agencies in implementing existing plans and conservation actions in the wetlands.
- 5.2. Assist federal and provincial government in fulfilling their commitments under Ramsar through formulating and implementing plans that promote the conservation and wise use of the Columbia Wetlands.
- 5.3. Support the new CWWMA management plan, by aligning priorities with outcomes identified in that plan.
- 5.4. Promote development of an OCP for Columbia-Shuswap Regional District “Area A”.
- 5.5. Work with Regional District Planners and First Nations to further determine how local and First Nation government planning and development approval processes can support protection of wetlands.
- 5.6. Work with First Nations to restore salmon to the Columbia River.
- 5.7. Remain current on provincial laws, regulations and policies in order to strengthen wetland policies affecting the future of a healthy Columbia Wetlands.
- 5.8. Enhance policy and guidance for wetland conservation on Crown land, including resource management, land administration, environmental assessment and the role that can be played by land use planning.
- 5.9. Work with BC Ministry of Environment to quantify water withdrawals (water licenses) from Lake Windermere, Columbia Lake, and Columbia River and Wetlands.

5. STRATEGIC DIRECTION – PARTNERSHIP

PARTNERSHIP GOAL: STRENGTHEN PARTNERSHIPS BY ENCOURAGING A FOCUSED AND INTEGRATED APPROACH TO MANAGING AND CONSERVING THE COLUMBIA WETLANDS.

OUTCOME: LOCAL RESIDENTS, COMMUNITIES, FIRST NATIONS, ORGANIZATIONS AND ALL LEVELS OF GOVERNMENT COLLABORATE AND EFFECTIVELY WORK TOGETHER TO IMPROVE MANAGEMENT AND CONSERVATION OF THE COLUMBIA WETLANDS.

ACTIONS

- 1.1. Work collaboratively with partners to enhance coordination, leadership, outreach, and learning about the importance of wetlands and wetland conservation actions.
- 1.2. Support inter-agency cooperation and coordination to ensure that wetland programs and policies do not have conflicting objectives.
- 1.3. Support the efforts of land securement agencies in all sectors to permanently protect and enhance wetlands.
- 1.4. Continue to work with partners to restore wetlands and address threats to support a healthy, resilient ecosystem.
- 1.5. Build partnerships with the academic community to research effective techniques for wetland restoration and creation, and monitoring.
- 1.6. Work with all levels of government to meet the current Ramsar Strategic Plan goal that enables the participation of stakeholders, including indigenous peoples and local communities, in conserving the Columbia Wetlands.
- 1.7. Encourage youth and youth groups to participate in CWSP projects and meetings to inspire the next generation of wetland stewards.

V. LINK TO PROVINCIAL WETLAND AUTHORITIES

A WETLAND ACTION PLAN FOR BRITISH COLUMBIA

CWSP's Strategic Action Framework aligns with a broader provincial approach. A *Wetland Action Plan for British Columbia (2010)*¹⁰ was developed by the Wetlands Stewardship Partnership as a strategic framework to be implemented cooperatively by governmental and non-governmental organizations in order to protect British Columbia's remaining natural wetlands, and to restore important wetlands that have been severely damaged.

The approach provided in the Wetlands Action Plan is to implement effective, regionally prioritized, and locally informed conservation strategies on the ground throughout the province in order to:

- enable wetlands to be inventoried, classified, assessed, and evaluated for benefits and threats;
- provide for development of appropriate guidelines and wetland-specific legislation;
- provide for appropriate actions to be taken, in conjunction with education and the provision of practical information and recommendations to local decision makers on the right method and the right place, to reduce the impact of human activities on sensitive wetland areas; and
- provide incentives for stewardship.

CWSP will ensure that its actions for the Columbia Wetlands contribute to achieving the goals and objectives of the provincial Wetlands Action Plan. BC's Wetlands Action Plan Goals and Objectives are to:

A. Clear and Comprehensive Information

1. Develop a comprehensive and reliable wetland information base to support effective planning, law-making, and policy development.
2. Increase public, industry and government awareness of the importance of wetlands and commitment to wetland protection and restoration.

B. Effective Legal and Planning Tools

3. Enhance legal protection of wetlands through effective and effectively enforced laws and policies.
4. Ensure the effective integration of wetland protection in strategic land use processes.

C. Effective Actions and Incentives for Wetland Protection

5. Secure the protection of priority wetlands and the conservation and restoration of natural wetlands throughout the province.
6. Improve coordination and strengthen partnerships to maximize effectiveness in wetlands protection and restoration.

10 https://bcwetlands.ca/files.wordpress.com/2016/11/bcwetlandactionplan_wsp_2010.pdf

VI. CONCLUSION

The Columbia Wetlands Stewardship Partners is committed to wetland conservation in the Columbia Valley. This Conservation Action Framework for the Columbia Wetlands for 2020-2025 represents an important step forward in the conservation and restoration of these exceptional wetlands.

Focused around five key directions and associated goals, the strategy offers a comprehensive suite of actions that CWSP and its partners can be undertaking to conserve and restore the critical habitat and associated biodiversity of the Columbia Wetlands, and ensure the ecosystem services they provide continue to benefit the people of the Columbia Valley and British Columbia, for now and for generations to come.

CWSP ENCOURAGES ALL OF OUR PARTNERS TO WORK TOGETHER
IN IMPLEMENTING THIS FRAMEWORK SO THAT COLLECTIVELY WE CAN
ENSURE THE **COLUMBIA WETLANDS** REMAIN AN ENDURING PART OF
OUR NATURAL LANDSCAPE AND CULTURAL HERITAGE.



*Boaters enjoying the
Columbia River near
Invermere. (Photo: Rick Hoar)*

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IX. APPENDICES

APPENDIX A: GLOSSARY OF TERMS AND KEY CONCEPTS¹¹

Adaptive capacity: The ability of biophysical systems to adapt to changing circumstances on an ongoing basis.

Adaptation measures: Actions that respond to actual or potential changes in biodiversity resulting from climate change. These can include activities by institutions, governments, business or the public to respond to current or projected impacts.

Agricultural working landscapes: Land used for crops pasture, and livestock; the adjacent uncultivated land that supports other vegetation and wildlife; and the associated atmosphere, the underlying soils, groundwater and drainage networks.

Biological diversity or biodiversity: The variety of life on Earth and the natural patterns it forms. Living organisms from all sources, including terrestrial and aquatic ecosystems, and the ecological complexes of which they are a part. This includes diversity within species, between species and of ecosystems.

Carbon sequestration: The removal and storage of carbon from the atmosphere in carbon sinks (such as wetlands, oceans, forests or soils) through physical or biological processes, such as photosynthesis.

Climate change adaptation: An adjustment in natural or human systems in response to actual or expected climatic stimuli, or their effects that moderates harm or exploits beneficial opportunities.

Climate change mitigation: An intervention intended to reduce adverse human influence on the climate system; it includes strategies to lower greenhouse gas emissions and to enhance greenhouse gas sinks.

Conservation: Actions that are intended to establish, improve or maintain natural conditions or efficient use of resources; can include protection, restoration, rehabilitation, enhancement, management, stewardship and wise use.

Cumulative effects: Changes to the environment over time as the result of combined effects from multiple activities and events.

Ecological processes or ecosystem function: The dynamic attributes of ecosystems, including interactions among organisms and interactions between organisms and their environment. Ecological processes are the basis for self-maintenance in an ecosystem.

¹¹ Definitions of key concepts were obtained from the UN Convention on Biological Diversity, International Union for Conservation of Nature, 2020 Biodiversity Goals and Targets for Canada, and A Wetlands Conservation Strategy for Ontario 2017-2030.

Ecosystem: A dynamic complex of plant, animal and micro-organism communities and their physical environment functioning as an ecological unit.

Ecosystem resilience: The capacity of an ecosystem to adapt to changes and disturbances and still retain its basic functions and structures.

Ecosystem services: The natural processes of healthy functioning ecosystems (see Natural Capital) result in the provision of many essential benefits that humans depend upon. These functions are said to “provide services” to humans because of the benefits humans derive from them and include “life-supporting services” (e.g., photosynthesis, oxygen production, water purification, nutrient cycling); the materials that ecosystems provide as “provisioning services” (e.g., food, fuel, fibre, medicine); the ways that ecosystems regulate environmental conditions as “regulating services” (e.g., clean the air and water, prevent soil erosion, reduce the spread of disease, mitigate impacts of climate); and their contributions to cultural life as “cultural services” (e.g., education, recreation, inspiration, physical and mental health including cognitive development).

Enhancement: Actions carried out on wetland or upland habitats to increase their carrying capacity for wildlife and their ability to provide ecosystem services (see also Restoration).

Federally listed species at risk: Species at risk of extirpation or extinction are listed under the federal Species at Risk Act (SARA) by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Habitat: An area on which a species depends, directly or indirectly, to carry out its life processes, such as reproduction, rearing, hibernation, migration or feeding.

Hydrologic function: The functions of the hydrological cycle that include the occurrence, circulation, distribution and chemical and physical properties of water on the surface of the land, in the soil and underlying rocks, and in the atmosphere, and water’s interaction with the environment, including its relation to living things

Invasive species: Species that are not native to an area and whose introduction or spread threatens native biological diversity, ecosystems, economies or human health.

Landscapes: Complexes of ecosystems in geographically defined areas.

Landscape-level: A perspective that is above individual sites, stands or other local ecological units; usually refers to a scale that considers a mosaic of interconnected ecological units.

Natural heritage: Natural features consisting of physical and biological formations or groups of such formations that are of outstanding value from the aesthetic or scientific point of view.

No net loss of wetlands: Balancing wetland loss with mitigation and restoration efforts so that functions and services are maintained and the area remains constant or increases

Management: Activities conducted on wetland or upland habitats to manage and maintain their carrying capacity for wildlife and their ability to provide ecosystem services.

Natural Capital: A term that helps illustrate how the physical natural environment, including ecosystem functions and processes, is a valuable asset to human society and should be reflected in decision processes along with other assets. Natural capital produces “ecosystem services” that have benefits for humans and significantly contribute to quality of life.

Other effective area-based conservation measures (OCM): Spatially explicit measures that are focused on long-term conservation, address threats to biodiversity and provide a net conservation benefit, but are not formally designated protected areas.

Private conservation lands: Privately owned areas that are legally protected in perpetuity for the purposes of conservation (e.g., fee simple acquisition, conservation covenants or easements).

Protected area: A clearly defined geographical space recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.

Protection: A commitment to protect individuals of a species, a population or subpopulation, or a habitat type or ecosystem (or portions of one) from adverse impacts that may result in their loss.

Restoration: The process of assisting the recovery of wetlands and their ecosystem services that have been degraded, damaged or destroyed. Restoration can encompass a wide variety of actions, including removing a specific source of stress, restoring natural processes such as flooding and fire, removing invasive species or reintroducing extirpated native species. Restoration can also include elements of rehabilitation, reclamation and ecosystem creation (e.g., wetland creation).

Retention: The protection (or preservation) of functional wetlands for ecosystem services and the provision of suitable habitat for wildlife.

Stewardship: An ethic that embodies cooperative planning and management of environmental resources in which individuals, organizations, communities and other groups actively engage in the prevention of habitat loss as well as the facilitation of resource restoration or rehabilitation, usually with a focus on long-term sustainability.

Stewardship activities: The actions of communities, groups or individuals that contribute to or facilitate the conservation of nature including, for example, taking care of natural areas, restoring habitat, reducing direct pressures on biodiversity, enhancing knowledge or understanding of the natural world and what can be done to conserve it, or increasing awareness of biodiversity values.

Sustainable management: Management that maintains and enhances the long-term health of natural ecosystems for the benefit of all living things while providing environmental, economic, social and cultural opportunities for present and future generations.

Sustainable use: The use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations.

Wetland: Lands that are seasonally or permanently covered by shallow water and saturated with long enough to promote wetland or aquatic processes as indicated by poorly drained soils, hydrophytic vegetation and various kinds of biological activity, which are adapted to a wet environment. The five major types of wetlands are bogs, fens, marshes, swamps and shallow open water.

Wetland complex: A group of wetlands that are functionally linked to one another.

Vulnerability: The degree to which an ecosystem is susceptible to adverse impacts of climate change. Vulnerability is a function of many factors, including the nature of the impacts, the degree to which the system is exposed, its sensitivity to change, and its resilience (ability to absorb the impact).



APPENDIX B: COMPLEMENTARY INITIATIVES

CWSP recognizes there are many ongoing conservation opportunities and initiatives that are complementary to the work of our partnership and the goals and outcomes set forth in this strategic framework. Over the five-year span of this framework, we anticipate that new local, provincial and global opportunities will arise and be supported by CWSP.

- 1. Upper Columbia River Aquatic Species at Risk Assessment and Recovery Strategy** is a 4-year project funded in 2019 by Department of Fisheries and Oceans Canada Nature Fund for Aquatic Species at Risk to restore the damaged tributaries and fisheries in the upper Columbia River. This collaborative project is led by the Shuswap Indian Band in partnership with Columbia Wetlands Stewardship Partners, Lake Windermere District Rod & Gun Club, Golden District Rod & Gun Club, Farmland Advantage and Living Lakes Canada. It focuses on the recovery and restoration of White Sturgeon and Westslope Cutthroat Trout (two SARA listed species), and restoration of the form and function of critical habitat and features that will comprise healthy aquatic and riparian ecosystems these endangered fish depend upon. Three leading components of the joint effort include: 1) Habitat Assessment & Restoration; 2) Species at Risk Management Actions; and 3) Restoration of Shuswap and Abel Creeks.
- 2. Memorandums of Understanding (MOUs) between Living Lakes Canada, CWSP and First Nations Stewardship or Guardianship Program** for the protection of creek tributaries - in process to be finalized in 2019. Living Lakes Canada is in the process of co-creating Operational MoUs with the Nations/Bands of the Columbia Basin. MoUs allow for a more collaborative approach to ensure joint priorities for source water protection are addressed. It allows us to combine efficiencies and resources in joint water stewardship efforts to enhance or maintain watershed and ecosystem health and help us all build more climate resilient communities for our future generations.
- 3. Living Lakes Canada - Columbia Basin Water Monitoring Collaborative and Open Source Data Hub Initiative** will make credible Columbia Basin water monitoring information available for engagement, education and management decisions, in support of watershed stewardship now and for future generations. Living Lakes is coordinating a multi sector steering committee which is providing direction for the Monitoring Collaborative. The Data Hub as part of the Collaborative will be cost-effective, open-source sharing of local, traditional and scientific information and knowledge. The Data Hub will fill important water data gaps while increasing local capacity for water monitoring and building healthy partnerships across the Columbia Basin.
- 4. Auditor General Report of Wetlands of BC** - The Office of the Auditor General is in the preliminary stages of conducting an audit of wetlands in BC and is still finalizing the scope. There are many issues regarding wetlands in BC, but the OAG can only audit initiatives that the Province has formally committed to, and since the Province has not

committed much around wetland conservation, their options on what to focus on are fairly narrow. The report is aimed for end of year.

5. **Provincial Wildlife Management Plan 2020** - In 2018, the Provincial government created a discussion paper and asked for public input on a new Wildlife Management Strategy. In 2019, meetings between government and stakeholders will take place to discuss the input and strategy government is developing.
6. **Fish & Wildlife Compensation Program Riparian/Wetlands Action Plan** was revised in 2019. CWSP provided broad guidance information and was involved in discussions regarding the Columbia Wetlands section of the new Action Plan.
7. **Kootenay Conservation Program (KCP) Conservation Neighbourhoods** are conservation collaboratives being created with leadership from the Kootenay Conservation Program¹² to form a network of “conservation neighbourhoods”. These collaborations form around a specific landscape or geography, such as a watershed, a valley or a wildlife corridor; they require cross-jurisdictional collaboration from multiple partners and stakeholders; and they are essential to addressing the mosaic of land ownership and management objectives inherent in landscape-scale conservation. In each Conservation Neighbourhood, diverse stakeholders are united by a commitment to their shared landscape and a desire to address overarching, large-scale problems such as: habitat fragmentation, declining biodiversity, invasive species, recreational pressure, fire fuel management and climate change. Resolution of these long-term, systems-level problems will require leveraging a diversity of resources, developing collective goals, and providing planning and actions that transcend organizational, land ownership, political and jurisdictional boundaries.
8. **Kootenay Connect** is a science-based initiative started in 2019 to identify, assess and initiate the establishment of regionally recognized wildlife connectivity areas within the East and West Kootenays. The approach focuses on the overlap between grizzly bear connectivity areas and riparian-wetland complexes in major valleys of the region. These riparian-wetland complexes are also excellent biodiversity hotspots and potential refugia from the impacts of climate change. The resulting maps of ecological networks will connect different landscape elements (riparian-wetland to upland habitats) and identify potential movement corridors for inhabiting wildlife. Combining this information with climate modeling will identify the most important areas for retaining landscape connectivity as species ranges shift over time. Kootenay Connect identified several connectivity areas within the Upper Columbia River and Wetlands and is working with CWSP to conserve and improve management of biodiversity and wildlife corridors.

12 www.kootenayconservation.ca

9. **BC Wildlife Federation's CWSP State of Education Survey** was conducted in 2017 to engage CWSP Partners and associates in order to find out about education programs being offered in the area, the audience programs were directed towards, potential overlaps, and what CWSP should be doing for wetlands education.
10. **The Columbia Wetlands Waterbird Survey (CWWS) (2015-2019)**, a project of Wildsight Golden, is a coordinated bird count that has utilized more than 200 citizen-scientists to gather baseline data. By providing an active citizen-science role, volunteers have become directly engaged with wildlife and local landscapes making them better informed to make sustainable personal decisions with positive actions in the wetlands. There are many important outcomes of the CWWS, including scientific contributions for species-at-risk, habitat enhancement projects, and increased public engagement (e.g., school-aged field trips, public bird walks, bird identification training) to raise awareness of the value of birds and wetlands. Baseline data will be used in 2019/2020 to nominate the Columbia Wetlands into the 'Important Bird and Biodiversity Area' (IBA) program. <https://wildsight.ca/branches/golden/columbiawetlandswaterbirdssurvey/>
11. **Target 1 Challenge Fund of the Canada Nature Fund** is administered by Environment and Climate Change Canada. Target 1 is the first of 19 targets under Canada's 2020 Biodiversity Goals and Targets that states: By 2020, at least 17 percent of terrestrial areas and inland water, and 10 percent of coastal and marine areas, are conserved through networks of protected areas and other effective area-based conservation measures. This federal government funding is available to acquire critical habitats and landscapes in order to increase Canada's protected areas network.
12. **United Nation's Sustainable Development Goals** aim to conserve and restore terrestrial ecosystems such as forests, wetlands, drylands, and mountains by 2020. Aligning CWSP strategies and actions with SDG 15 Life on Land, encourages taking urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species. In addition, aligning CWSP's strategies and actions with SDG 13 Climate Action, encourages the integration of climate change measures into policies, planning and education in order to raise awareness about reducing impacts through mitigation and adaptation.
13. **United Nation's Strategic Plan for Biodiversity for 2011–2020 and Aichi Biodiversity Targets** set global targets for conservation under the Convention on Biological Diversity, and specifically a target for spatial conservation known as Aichi Target 11. By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

APPENDIX C: EXISTING MANAGEMENT PLANS FOR THE COLUMBIA WETLANDS

Source: Columbia Wetlands Stewardship Partners (2016)

Plan #	Type of Plan	Name of Plan	Organization/Author	Date Plan Published
1	First Nation Community or Land Management Plan	?akisqnuq First Nation Comprehensive Community Plan		2016
2	First Nation Community or Land Management Plan	?akisqnuq First Nation Land Use Plan-Draft Version		2017
3	First Nation Community or Land Management Plan	Shuswap Band Land Use Plan Draft April 2016		2016?
4	First Nation Community or Land Management Plan	Shuswap Indian Band Land Code May, 2014		2014
5	Guidelines	Columbia Lake Shoreline Management Guidelines for Fish and Wildlife Habitats	McPherson and Hlushak	2010
6	Guidelines	Develop with Care: Environmental Guidelines for Urban and Rural Land - Kootenay Boundary Region (FLNRO 2014)	FLNRO	2014
7	Guidelines	Wetland Ways: Interim Guidelines for Wetland Protection and Conservation in British Columbia	Cox	2009
8	Guidelines	Windermere Lake Shoreline Management Guidelines for Fish and Wildlife Habitats	McPherson	2009
9	Invasive Plant/Pest Management Plans	Akisqnuq First Nation Invasive Plant Management Plan	Kaisner	2016
10	Invasive Plant/Pest Management Plans	Columbia Shuswap Invasive Species Society Strategic Plan 2019 to 2024	Columbia Shuswap Invasive Species Society	2018
11	Invasive Plant/Pest Management Plans	CSRD Pest Management Plan; Mosquito Control Management Plan for Golden, Revelstoke & Scotch Creek	Columbia-Shuswap Regional District	2016
12	Invasive Plant/Pest Management Plans	East Kootenay Invasive Plant Council 2013-2018 Regional Strategic Plan	East Kootenay Invasive Plant Council	2013
13	Invasive Plant/Pest Management Plans	Columbia Shuswap Operational Plan for Invasive Species 2020-2025	Columbia Shuswap Invasive Species Society	2019
14	Land & Water Management, Strategy & Action Plans	A Habitat Restoration Strategy for the Upper Columbia Basin		2004

15	Land & Water Management, Strategy & Action Plans	A Wetland Action Plan for British Columbia	Wetland Stewardship Partners	2010
16	Land & Water Management, Strategy & Action Plans	Columbia Basin Large Lakes Action Plan – Draft	FWCP	2012
17	Land & Water Management, Strategy & Action Plans	Columbia Basin Plan	BC Hydro	2012
18	Land & Water Management, Strategy & Action Plans	Columbia Basin Species of Interest Action Plan – Draft	FWCP	2014
19	Land & Water Management, Strategy & Action Plans	Columbia Lake Lot 48 Property Management Plan, British Columbia Region 2013-2018	Nature Conservancy of Canada	2012
20	Land & Water Management, Strategy & Action Plans	Columbia Lake Management Strategy	Urban Systems	1997
21	Land & Water Management, Strategy & Action Plans	Columbia Wetlands Wildlife Management Area: Operational Plan: 1998-2002	FLNRO	1998
22	Land & Water Management, Strategy & Action Plans	Implementation Plan: Wetlands and Associated Species	Columbia Intermountain Joint Venture	2010
23	Land & Water Management, Strategy & Action Plans	Lake Windermere Management Plan	Berris	2011
24	Land & Water Management, Strategy & Action Plans	Management Plan for the Columbia National Wildlife Area (Proposed)	Environment & Climate Change Canada-Gebhauer	2016
25	Land & Water Management, Strategy & Action Plans	Riparian and Wetlands Action Plan – Draft	FWCP	2014
26	Land & Water Management, Strategy & Action Plans	Upland/Dryland Action Plan – Draft	FWCP	2012
27	Land & Water Management, Strategy & Action Plans	Wildlife and Habitat Prescription for Hoodoo-Hofert Property Management Unit 23 East Kootenay Region, British Columbia	Nature Trust of BC	2004
28	Official Community Plan	Fairmont Hot Springs & Columbia Lake Area Official Community Plan, Bylaw No.2779	Board of the Regional District of East Kootenay	2017
29	Official Community Plan	Lake Windermere Official Community Plan Bylaw No.2061	Board of the Regional District of East Kootenay	2008; 2015
30	Official Community Plan	Official Community Plan Village of Canal Flats 2005	Board of the Regional District of East Kootenay	2016
31	Official Community Plan	Steamboat-Jubilee Mountain Official Community Plan, Bylaw No.1926	Board of the Regional District of East Kootenay	2006
32	Official Community Plan	Toby Benches Official Community Plan Bylaw No.2676	Board of the Regional District of East Kootenay	2016
33	Official Community Plan	Town of Golden Official Community Plan Bylaw No. 1222	Board of the Columbia Shuswap Regional District	2008

34	Official Community Plan	Village of Radium Hot Springs Official Community Plan Bylaw No. 254	Board of the Regional District of East Kootenay	2002
35	Official Community Plan	Village of Radium Hot Springs Official Community Plan, June 2013	Board of the Regional District of East Kootenay	2013
36	National Park Plan	Kootenay National Park of Canada Management Plan (under review)		2019
37	Provincial Park Plan	Burges and James Gadsden Provincial Park Purpose Statement and Zoning Plan ¹³		2003
38	Provincial Park Plan	Canal Flats Provincial Park Purpose Statement and Zoning Plan		2003
39	Provincial Park Plan	Management Direction Statement for Columbia Lake Provincial Park		2004
40	Provincial Park Plan	Management Direction Statement for James Chabot Provincial Park		2004
41	Provincial Park Plan	Marl Creek Provincial Park Purpose Statement and Zoning Plan		2013
42	Provincial Park Plan	Thunder Hill Provincial Park Purpose Statement and Zoning Plan		2013
43	Provincial Park Plan	Windermere Lake Provincial Park Purpose Statement and Zoning Plan		2003
44	Species -COSEWIC Assessment, Status, and Update Reports	COSEWIC Assessment and Status Report on the American Badger <i>Taxidea taxus</i> in Canada	COSEWIC	2012
45	Species -COSEWIC Assessment, Status, and Update Reports	COSEWIC Assessment and Status Report on the Caribou <i>Rangifer tarandus</i> : Northern Mountain population, Central Mountain population, Southern Mountain population in Canada	Cichowski	2014
46	Species -COSEWIC Assessment, Status, and Update Reports	COSEWIC Assessment and Status Report on the Flammulated Owl <i>Otus flammeolus</i> in Canada	Cannings	2010
47	Species -COSEWIC Assessment, Status, and Update Reports	COSEWIC Assessment and Update Status Report on the Grizzly Bear <i>Ursus arctos</i> in Canada - Prairie population, Northwestern population	Ross	2002
48	Species -COSEWIC Assessment, Status, and Update Reports	COSEWIC Assessment and Status Report on the Grizzly Bear <i>Ursus arctos</i> Western population in Canada	McLoughlin	2012
49	Species -COSEWIC Assessment, Status, and Update Reports	COSEWIC Assessment and Status Report on the Lewis's Woodpecker <i>Melanerpes lewis</i> in Canada	Beauchesne	2010

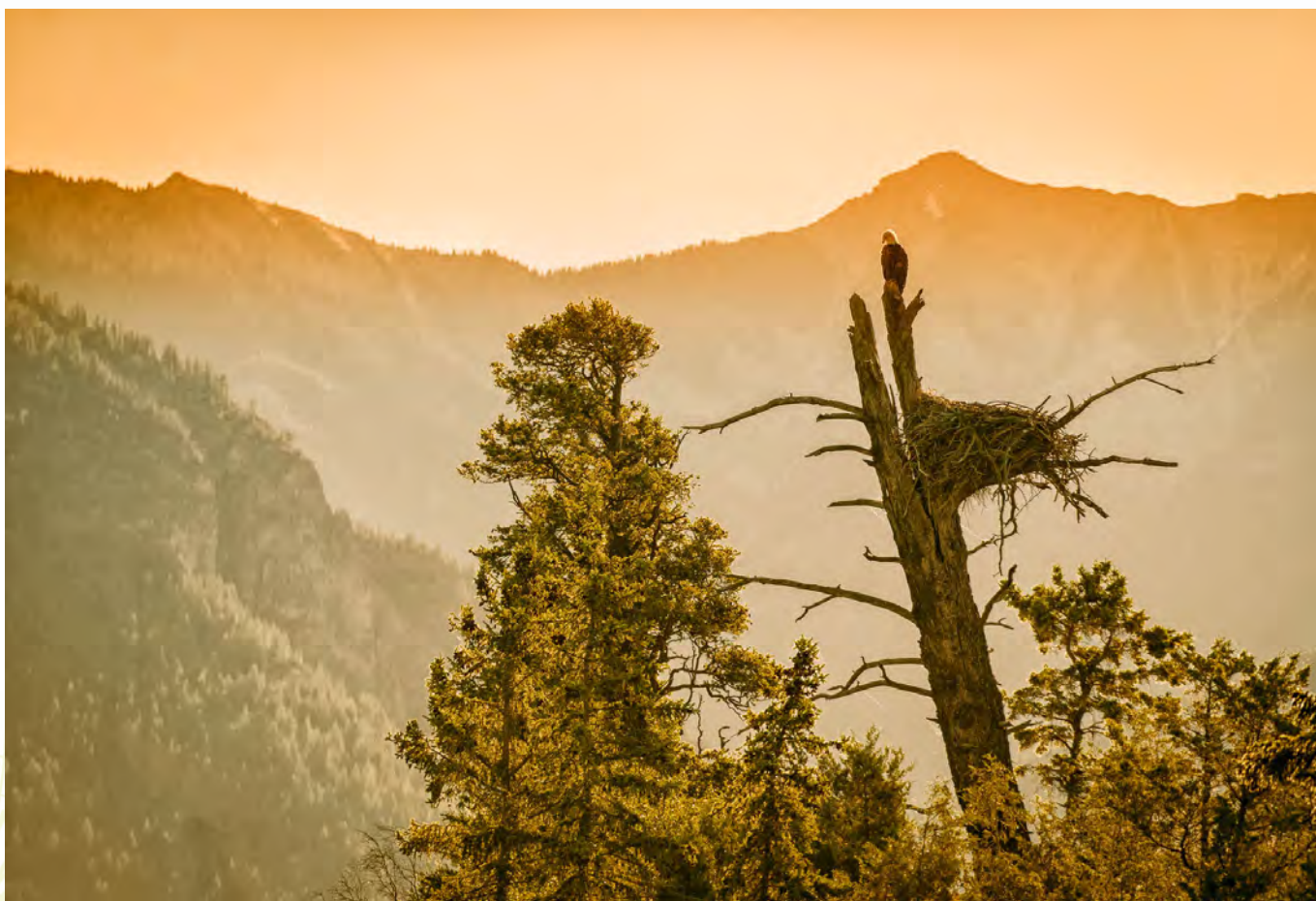
13 No longer valid. Canal Flats is no longer a provincial park and is now a local park.

50	Species -COSEWIC Assessment, Status, and Update Reports	COSEWIC Assessment and Status Report on the Limber Pine <i>Pinus flexilis</i> in Canada	Achuff	2014
51	Species -COSEWIC Assessment, Status, and Update Reports	COSEWIC Assessment and Update Status Report on the Northern Leopard Frog <i>Lithobates pipiens</i> Rocky Mountain population in Canada	Taylor	2009
52	Species -COSEWIC Assessment, Status, and Update Reports	COSEWIC Assessment and Status Report on the Western Painted Turtle (COSEWIC 2006)	COSEWIC	2006
53	Species -COSEWIC Assessment, Status, and Update Reports	COSEWIC Assessment and Update Status Report on the Southern Maidenhair Fern <i>Adiantum capillus-veneris</i> in Canada (COSEWIC 2000)	COSEWIC	2000
54	Species -COSEWIC Assessment, Status, and Update Reports	COSEWIC Assessment and Status Report on the Westslope Cutthroat Trout <i>Oncorhynchus clarkii lewisi</i> . British Columbia population, Alberta population in Canada	Costello	2006
55	Species -COSEWIC Assessment, Status, and Update Reports	COSEWIC Assessment and Update Status Report on the Wolverine (<i>Gulo gulo</i>) Eastern population, Western Population in Canada	Slough	2003
56	Species -COSEWIC Assessment, Status, and Update Reports	COSEWIC Status Appraisal Summary on the Long- billed Curlew (<i>Numenius americanus</i>) in Canada)	Perkins	2011
57	Species -COSEWIC Assessment, Status, and Update Reports	COSEWIC Status Report on the Western Toad (<i>Anaxyrus boreas</i>)	Slough	2012
58	Species Management, Strategy & Recovery Plans	A Management Strategy for Species at Risk in a Semi-Urban Landscape on the Shuswap Reserve at Invermere, B.C.	Jamieson et al.	2009
59	Species Management, Strategy & Recovery Plans	A Strategy for the Recovery of Mountain Caribou in British Columbia	Mountain Caribou Technical Advisory Committee	2002
60	Species Management, Strategy & Recovery Plans	Bird Conservation Strategy for Bird Conservation Region 10 Pacific and Yukon Region: Northern Rockies	Environment Canada	2013
61	Species Management, Strategy & Recovery Plans	Columbia Basin Species of Interest Action Plan – Draft	FWCP	2012
62	Species Management, Strategy & Recovery Plans	Columbia River White Sturgeon Management Plan. Monitoring Program and Physical Works Annual Report	BC Hydro	2015
63	Species Management, Strategy & Recovery Plans	Conservation Framework. Conservation Priorities for Species and Ecosystems Primer	BC Ministry of the Environment	2009

64	Species Management, Strategy & Recovery Plans	Kootenay Elk Management Plan 2010 to 2014	BC Ministry of the Environment	2010
65	Species Management, Strategy & Recovery Plans	Kootenay-Boundary Mule Deer Management Plan 2014-2018	BC Ministry of Forests, Lands, and Natural Resource Operations	2014
66	Species Management, Strategy & Recovery Plans	Management and Protection of Badgers in the East Kootenay of British Columbia - Draft	Newhouse	2001
67	Species Management, Strategy & Recovery Plans	Management Options and Related Actions for Mountain Caribou in British Columbia	Mountain Caribou Science Team	2006
68	Species Management, Strategy & Recovery Plans	Management Plan for the Flammulated Owl (<i>Otus flammeolus</i>) in Canada and in British Columbia	Environment Canada	2013
69	Species Management, Strategy & Recovery Plans	Management Plan for the Grey Wolf (<i>Canis lupus</i>) in British Columbia	Wilson	2014
70	Species Management, Strategy & Recovery Plans	Management Plan for the Lewis's Woodpecker (<i>Melanerpes lewis</i>) in Canada (Environment Canada 2016)	Environment Canada	2016
71	Species Management, Strategy & Recovery Plans	Management Plan for the Northern Rubber Boa (<i>Charina bottae</i>) in British Columbia	Gregory	2015
72	Species Management, Strategy & Recovery Plans	Management Plan for the Painted Turtle – Intermountain–Rocky Mountain Population (<i>Chrysemys picta</i> pop. 2) in British Columbia	BC Ministry of the Environment	2017
73	Species Management, Strategy & Recovery Plans	Management Plan for the Western Toad (<i>Anaxyrus boreas</i>) in British Columbia	Provincial Western Toad-Working Group	2014
74	Species Management, Strategy & Recovery Plans	Management Plan for the Westslope Cutthroat Trout (<i>Oncorhynchus clarkii lewisi</i>) in British Columbia (BC Ministry of Environment BC Freshwaters Program 2014)	BC Ministry of the Environment, Freshwaters Program	2014
75	Species Management, Strategy & Recovery Plans	National Recovery Strategy for American Badger, <i>jeffersonii</i> subspecies (<i>Taxidea taxus jeffersonii</i>) draft paper (jeffersonii Badger Recovery Team 2003)	Badger Recovery Team	2003
76	Species Management, Strategy & Recovery Plans	Provincial Framework for Moose Management in British Columbia	BC Ministry of Forests, Lands, and Natural Resource Operations	2015
77	Species Management, Strategy & Recovery Plans	Recovery Plan for the Northern Leopard Frog (<i>Lithobates pipiens</i>) in British Columbia	Northern Leopard Frog Recovery Team	2012
78	Species Management, Strategy & Recovery Plans	Recovery Strategy for the Badger (<i>Taxidea taxus</i>) in British Columbia. British Columbia Recovery Strategy Series (<i>jeffersonii</i>)	Badger Recovery Team	2008

79	Species Management, Strategy & Recovery Plans	Recovery Strategy for the Lewis's Woodpecker (<i>Melanerpes lewis</i>) in Canada (Proposed)	Environment and Climate Change Canada	2016
80	Species Management, Strategy & Recovery Plans	Recovery Strategy for the Northern Leopard Frog (<i>Lithobates pipiens</i>), Rocky Mountain Population in Canada (proposed)	Environment and Climate Change Canada	2016
81	Species Management, Strategy & Recovery Plans	Recovery Strategy for the Olive-sided Flycatcher (<i>Contopus cooperi</i>) in Canada	Environment and Climate Change Canada	2016
82	Species Management, Strategy & Recovery Plans	Recovery Strategy for the Southern Maidenhair Fern (<i>Adiantum capillus-veneris</i>) in British Columbia	Smith et al.	2007
83	Species Management, Strategy & Recovery Plans	Recovery Strategy for the Southern Maidenhair Fern (<i>Adiantum capillus-veneris</i>) in Canada	Sadler	2013
84	Species Management, Strategy & Recovery Plans	Recovery Strategy for White Sturgeon (<i>Acipenser transmontanus</i>) in Canada. In Species at Risk Act Recovery Strategy Series	Fisheries and Oceans Canada	2014
85	Species Management, Strategy & Recovery Plans	Recovery Strategy for the Woodland Caribou, Southern Mountain Population (<i>Rangifer tarandus caribou</i>) in Canada (proposed) (Environment Canada 2014)	Environment Canada	2014
86	Species Management, Strategy & Recovery Plans	Upper Columbia White Sturgeon Recovery Plan	Upper Columbia White Sturgeon Recovery Initiative	2002
87	Species Status Report	Status of Chiselmouth (<i>Acrocheilus alutaceus</i>) in the Windermere and Columbia Lake Watersheds	Radridge	1998
88	Species Status Report	Status of Rocky Mountain Bighorn Sheep in British Columbia	Demarchi	2000
89	Species Status Report	Status of Rocky Mountain Bighorn Sheep in the East Kootenay	Teske	2015
90	Species Status Report	Status of the Badger in British Columbia	Rahme	1995
91	Species Status Report	Status of the Bald Eagle in British Columbia	Blood	1994
92	Species Status Report	Status of the Flammulated Owl in British Columbia	van Woodenberg	1999
93	Species Status Report	Status of the Least Chipmunk (<i>Tamias minimus</i>) subspecies <i>T. m. oreocetes</i> and <i>T. m. selkirki</i> in British Columbia	Nagorsen	2010
94	Species Status Report	Status of the Lewis's Woodpecker in British Columbia	Cooper	1998
95	Species Status Report	Status of the Sandhill Crane in British Columbia	Cooper	1996
96	Species Status Report	Taking Nature's Pulse: The Status of Biodiversity in British Columbia	Austin	2008

97	Species Status Report	The Status of Bull Trout in British Columbia: A Synthesis of Available Distribution, Abundance, Trend, and Threat Information	Hagen	2011
98	Status Report on Management Plan	Status Report East Kootenay Angling Management Plan	East Kootenay Angling Management Plan Committee B.C. Water, Land, and Air Protection	2003



An eagle surveys the Columbia Wetlands from its nest. (Photo: Pat Morrow).

APPENDIX D: EXISTING WETLAND POLICIES AND LEGISLATION

The following list of wetland policies and legislation was drawn from the Synthesis of Local and Regional Conservation and Management Goals and Objectives for the Columbia Wetlands (Living Lakes Canada, 2018) for CWSP. The list is based on previous work summarized in A Wetland Action Plan for British Columbia (2010). There are updates to these policies and legislation as well as new ones such as, the Water Sustainability Act.

INTERNATIONAL CONVENTIONS, AGREEMENTS, AND PROGRAMS

Four international conventions and agreements confer wetland-related responsibilities directly on BC:

- The Convention on Wetlands of International Importance (Ramsar, Iran, 1971)
- The Convention on Biological Diversity (CBD) (Rio de Janeiro, Brazil, 1992)
- The North American Waterfowl Management Plan (NAWMP) (1986)
- The Britain (Canada) – USA Migratory Birds Convention Act (1916 and 1994)

NATIONAL POLICIES AND LEGISLATION

- Federal Policy on Wetland Conservation
- Canada Wildlife Act – National Wildlife Areas
- Species at Risk Act
- National Parks Act
- Oceans Act - Marine Protected Areas Act
- Canadian Environmental Assessment Act
- Canadian Environmental Protection Act
- Navigable Protection Act
- Federal Fisheries Act
- Income Tax Act

PROVINCIAL LEGISLATION

The following provincial legislation and regulations may affect or help protect BC wetlands:

- Agricultural Land Commission Act – Agricultural Land Reserve Use, Subdivision and Procedure Regulation
- Agriculture Land Reserve Act
- Columbia Basin Trust Act
- Community Charter – Spheres of Concurrent Jurisdiction – Environment and Wildlife Regulation
- Dike Maintenance Act
- Drainage, Ditch and Dike Act
- Drinking Water Protection Act – Drinking Water Protection Regulation
- Ecological Reserve Act and Regulations
- Environmental Assessment Act – Reviewable Projects Regulation
- Environmental Management Act – Contaminated Sites Regulation; Municipal Sewage Regulation; Agricultural Waste Control Regulation
- Farm Practices Protection (Right to Farm) Act
- Fish Protection Act – Riparian Area Regulation; Sensitive Streams Designation and Licensing Regulation

- Fisheries Act – Fisheries Act Regulations; Aquaculture Regulation
- Flood Relief Act
- Forest Act
- Forest and Range Practices Act
- Greenbelt Act
- Heritage Conservation Act
- Islands Trust Act – Islands Trust Regulation; Islands Trust Natural Area Protection Tax Exemption Regulation
- Land Act – Land Use Objectives Regulation
- Land Title Act
- Local Government Act
- Local Services Act
- Mineral Tenure Act
- Mining Right of Way Act
- Motor Vehicle (All Terrain) Act
- Muskwa-Kechika Management Area Act
- Park Act – Park, Conservancy and Recreation Area Regulation
- Petroleum and Natural Gas Act – Drilling and Production Regulation; Geophysical Exploration Regulation
- Plant Protection Act
- Protected Areas of British Columbia Act
- Public Health Act – Sewerage System Regulation; West Nile Virus Control Regulation; Health Act Communicable Disease Regulation³²
- Range Act and Range Regulation
- Significant Projects Streamlining Act
- Transportation Act – No Net Loss Wetland Policy
- Water Act – Water Regulation
- Weed Control Act – Weed Control Regulation
- Wildlife Act – Wildlife Management Areas Regulation

PROVINCIAL STRATEGIES AND PROGRAMS

Several non-statutory provincial strategies and programs have the potential to affect wetlands:

- Provincial Water Strategy (Living Water Smart)
- BC Climate Action Plan (Live Smart BC)
- BC Conservation Framework
- BC Air Action Plan
- Integrated Watershed Management/Land Use Planning
- Water Use Planning
- Invasive Species Strategy
- Best Management Practices (Develop with Care)
- Drought Protection Strategy
- Watershed Based Fish Sustainability Planning
- Code of Practice for the Use of Reclaimed Water (Municipal Sewage Regulation)
- Flood Hazard Land Use Management Guidelines
- Integrated Community Sustainability Planning Initiative (ICSP)

LOCAL GOVERNMENT

The Community Charter and the Local Government Act allow local governments to undertake land use planning and protect wetlands through:

- Official Community Plans
- Local Area Plans
- Land Use Bylaws
- Environmental Protection Bylaws
- Regional Growth Strategies
- Environmentally Sensitive Areas (ESAs) mapping
- Environmental Development Permit Areas (EDPAs)
- Local and Regional Conservation Strategies





Cover Photo: Pat Morrow

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