Previous Gov't & Agency policy direction (for 16 years) has seriously contributed to "the steady decline of fish & wildlife populations and loss of habitat as a result of chronic underfunding of the various fish & wildlife portfolios" as outlined by the BC Wildlife Federation during their series of Town Hall meetings throughout British Columbia (pre-election).

This new Government has the opportunity to reverse the determined intention to knowingly and willfully killing western toads at Summit Lake & Site C.

Please find enclosed the correspondence I have been receiving from the Public.

Western Toads at Summit Lake:

Of particular concern is the forestry impacts associated with the maze of logging roads and series of planned clearcuts within the core terrestrial wet forest habitat for the Western toad at Summit Lake and the linkage of the FWCP to this issue.

As outlined in the Terms of Reference for the Public and First Nation Reps:
"Recommend actions to mitigate any negative perceptions about the Program or any misunderstandings about the Programs purpose, activities and/or accomplishments."

The public, conservation stakeholders and media conversation and actions towards the FWCP's perceived conflict of interest is growing, (Roles, Responsibilities and Policy requirements to compensate for Dam Impacts).

Examples:

Co-Chair (FWCP) / Director of Resource Management (FLNRO) John Krebs

Senior Wildlife Biologist (FWCP) Irene Manley

Contract Biologists (FWCP) Jakob Dulisse Thomas Hill

1) The Valley Voice Newspaper Feb. 10/16 NACFOR Summit Lake logging operations expected to start soon

"The research team, including Dulisse, Irene Manley wildlife biologist with Ministry of Forests, Lands and Natural Resources; Thomas Hill field technician and Erin McLeod one of NACFOR's summer students, did night surveys on three of the blocks to identify the habitat features that will be protected during harvesting."

2) The Valley Voice Newspaper Feb. 24/16 Protest camp preventis NACFOR from work at Summit Lake

"A recent report on the issue by Wayne McCrory, conservation biologist, supports the protesters park expansion concept. For Summit Lake, given the high public profile, the provincial significance of the toad population, its blue-listed status and the model research leading to successful highway mortality mitigation, it is very surprising that MFLNRO has not seriously considered the option of protection of core terrestrial habitat on the Summit Lake south side to provide the most protection for the Summit Lake toad population."
Hi John Horgan, Andrew Weaver, Katrine Conroy, Michelle Mungall, Doug Donaldson, George Heyman, Kenneth Peterson, David Morton,

Please find enclosed; Background on BC Hydro (a Government unto itself)
Background on the Western Toad at Summit Lake

It is time to reign-in BC Hydro and reinstate BC Hydro as the Province’s most valuable Crown Corporation & Public Utility.

BC Hydro’s total debt and privatization policies (control of production, transmission and distribution) have received far too little public scrutiny and has enormous implications for the future of BC Hydro and for public ownership, control and management of its electricity system.

Stop Site C and all the associated impacts; Massive debt, environmental damage, loss of fish & wildlife populations/crucial habitat, flooding Class 1 agriculture land, expropriations etc, and unreasonable priced electricity for ratepayers and taxpayers.

It is in the public interest to redress BCUC’s role and responsibilities as an independent regulator and establish documentation of all BC Hydro’s actual debt load under an independent forensic auditor (including Site C / IPP’s).

Please do not allow Fortis Inc. to purchase from Teck Resources the two-thirds share of the Waneta Dam. This is an excellent opportunity to have public ownership of the Waneta by BC Hydro, Columbia Basin Trust and Columbia Power Corporation.

The Province - BC Hydro - the Ministry of Forests, Lands and Natural Resource Operations - the Fish & Wildlife Compensation Program and the Columbia Basin Trust at the Regional level, are failing to compensate, conserve, protect and enhance this exceptional western toad population, their core terrestrial forest habitat and one of the biggest toad migrations on the planet.

* We wish to thank you for making the necessary changes at BC Hydro and the BC Utilities Commission, review of the Site C Dam & Reservoir, ownership of the Waneta Dam and stopping the Grizzly trophy hunt.

* Also a special appreciation of Andrew’s media support for the western toad and Katrine’s support for the western toad in the legislature while in opposition.

Looking at the key priorities for the Premier’s Cabinet and using the Western Toad at Summit Lake as a model, let us begin working together to implement endangered species legislation, modernizing land-use planning to include FN & communities and using the Great Bear Rainforest as a model for ecosystem-based management that will support British Columbia’s fish, wildlife and their habitats.

Building on the Ministers key priority objectives and combining all the other numerous conservation and management action plans, Wildlife Habitats for Tomorrow is suggesting developing a high level Provincial - Integrated Watershed-based Management Plan (Manitoba) and a Comprehensive Fish & Wildlife Conservation Strategy (Washington State). (examples enclosed in the package).
Please intervene to establish dam impact Compensation for this Priority 1 amphibian, support Conservation of this species at risk and designate habitat Protection under Park / Goal 2 - Protected Areas Strategy (PAS). (663 ha.)
There is 3,921 hectares of special features remaining to be allocated.

Thank you

Grant Trower
Communications Coordinator
Wildlife Habitats for Tomorrow Box 1088 Kaslo BC V0G 1MO 250-366-4375
lardauriver@yahoo.ca
3) The Valley Voice Newspaper Mar. 23 / 16 Mild weather stops NACFOR operations at Summit Lake

"A group of people wanting to save the toads blockaded NACFOR when they showed up for work Feb. 18, and Tobey said a week of consulting for legal options and advice lead to the RCMP attending the barricade and opening of the road to commence road building Mar. 1, "
"We don't know enough about the toads, Charet said. yes, they've done some studies, but the toads are bordering on extinction. We can't keep doing what we're doing and expect the species to survive. "

4) Westbank First Nation to Rick Fraser Feb. 22 /16

"Our office has spoken to several other Okanagan Bands and no one was informed of this serious issue, Westbank, nor the Okanagan bands would consider this as full consultation. "
"Westbank does not support the issuance of this permit and is requesting to halt any further harvesting to this area until adequate research has been conducted on toads and toadlets and some form of mitigation being put in place. "

5) Jim Guido / John Krebs reply to Wayne McCrory Mar. 10 / 16

"Small patch harvest off these road systems has taken place as recent as 2007 without any these specific measures being implemented. it is important to recognize that the scope of toad work at Summit Lake initially focussed on addressing the most urgent issue- road mortality. The potential impacts from forest harvesting came to light recently, and is being addressed in a collaborative and adaptive management fashion. "

6) Jim Guido reply to Wayne McCrory Mar. 11 / 16

"It is not our intention to avoid the discussion of the appropriate habitat protection actions, how these are guided by ongoing studies and what activities we think can safely take place. "

7) Rick Fraser reply to Westbank First Nation Mar. 16 / 16

"The Ministry of Transportation and Infrastructure, Fish and Wildlife Compensation Program, Columbia Basin Trust, NACFOR and staff from the Ministry of Forest, Land and Natural Resource Operations have been working cooperatively on protecting the critical habitat, and the cautious and monitored harvesting activities will contribute to our understanding of the toads habitat needs. These include best management practices of logging on snowpack, predetermining micro habitats that protect hibernating toads and managing traffic on roads that are used by toads through their migration. NACFOR is cooperating with the implementation of these practices and proposing a slow approach to these activities so that they along with the Ministry Resource Management Biologists can further develop their understanding of the toads needs. These carefully planned
and carried out operations will increase our knowledge and understanding of this species of concern which will not only benefit this population but others throughout its range in the province.”

8) Tim Sheldon - Deputy Minister FLNRO reply to Crystal Spicer Mar. 16 / 16

“These agencies have been working cooperatively to protect critical western toad habitat and study toad migration. As such, logging activities will proceed cautiously, with close monitoring by our ministry. Information gained through this work is expected to aid our scientific understanding of western toads and contribute to best practices advice, which will encourage the species’ recovery."

9) Chris O'Riley - Deputy CEO - BC Hydro reply to Debbie Pitaoulis April 15 / 16*

“Western toad research and conservation activities continue to be important to the FWCP in the Columbia region. Specifically, the FWCP Columbia Board has supported these activities since 2010 with financial contributions of over $360,000. In 2016-17 activities include continuation of an ongoing western toad population assessment, construction, maintenance and monitoring of highway fencing at the (Highway 6) highway site and support for the annual ToadFest event."

“An important distinction is that the scope and mandate of the FWCP does not include making decisions related to land use and resource extraction, including logging. This responsibility rests with the Province of BC, in this particular case the Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) and Nakusp and Area Community Forest (NACFOR).

10) Jim Standen - Assistant Deputy Minister - BC Parks and Conservation Officer Service Division reply to Elsje deBoer April 21 / 16

“As you know, Ministry of Environment staff along with Wildlife staff at FLNRO, as well as a contract biologist funded by the Fish and Wildlife Compensation Program have developed a draft best management practices document and implementation has begun through mitigation measures to maintain habitat features within harvested blocks for Western Toads."

11) Paul M. Rasmussen - Regional Executive Director - FLNRO May 12 / 16

“Although this logging occurred without benefit of current best management practices, a continued viable population now thrives, indicating population residence over time, within their current habitat. That said, we continue to develop understanding of the species and further improvement to logging practices."
1) Wildlife Impacts Due to BC Hydro Dams in the Columbia Basin.

Irene Manley and John Krebs - 2011

Restore / Maintain Ecosystem Connectivity

Creation of large reservoirs can fragment landscapes for wide-ranging species. In conjunction with other development such as transportation corridors, human settlement, agriculture, forestry, recreation, these cumulative effects can result in species loss. Following significant habitat loss, fragmentation and under significant threat from multiple stressors for wetland-dependant species, loss of landscape connectivity between breeding, summer and winter habitats as well as loss of connection among wetlands has reduced the population resilience of amphibian species such as the Northern leopard frog and the Western toad.

2) Western Toad Habitat Considerations for Forestry Operations.

Jakob Dulisse, Irene Manley and Thomas Hill

Forest Practices

“ It should be noted that it will be very difficult to retain many of these features in a clear cut harvest scenario - it will be much easier to retain these features through partial cutting methods. “

“ Proximity to a breeding area (at this site, Summit Lake) is likely the most important terrestrial habitat variable for western toads (i.e the density of toads migrating and hibernating is likely highest near breeding areas). This should be considered when planning harvest activities near wetlands and lakes - cut blocks should be located as far from amphibian breeding sites as possible. Buffer and movement / mitigation corridors adjacent to breeding sites should be identified and retained. ”

“ In order of importance, key Western Toad habitat features can be retained in a forestry setting by:
* Not harvesting in the best Western Toad habitat (i.e. areas closest to breeding sites). “
Reading through the letters I can appreciate the growing constituency of people who realize the importance to protect the forest habitat for this exceptional Western Toad site at Summit Lake. It is also understandable that people are questioning the messaging outlined in the agencies letters, suggesting they are "working cooperatively on protecting the critical habitat while cautiously and slowly building roads and logging, as biologists further develop their understanding and increase their knowledge of the Western toads forest habitats." It is interesting to read that using the (to be determined or on going) best management practices for harvesting and road building within the toads core terrestrial habitat will actually result in a benefit for this species of concern. It is not surprising about the confusion towards the perception of conflict of interest by the FWCP now that it is working to mitigate habitat - species loss and encourage species recovery from forestry impacts (logging activities) rather than conservation, restoration and protection of the western toads crucial wet forest ecosystem.

Obviously, by reading the key correspondence above, there is a gap of information that was requested to be provided to the Board in preparation for the Western Toad issue, for the April 18th and May 17th meetings, leaving the Board inadequately prepared.

Please provide an answer to the following questions before the June 1st meeting; Thank you.

Was the Board notified of the research teams participation and role to develop best management practices for mitigating forestry impacts within the core Western Toad terrestrial habitat at Summit Lake? I do not remember the Boards endorsement.

How did the FWCP staff get involved with NACFOR's community forest operations (recommendations for best logging practices) and which budgets are contributing to this work?

$750,000 ($360,000 FWCP) already spent helping these amphibians move from their aquatic / terrestrial habitats and it would be beneficial for the Board to have a list of the summary reports outlining the multi years of research and resulting outcomes to date, i.e. what are the results and recommendations of the tunnel and the fencing?

Could you please send out the copy of Jakob, Irene and Thomas's - Western Toad Habitat Considerations for Forestry Operations at Summit Lake 2015 report.

Looking forward to the next steps that will support the Programs conservation and enhancement work at Summit Lake by trying to get in front of the toads issue and deciding about having an open-house well before this years ToadFest.

all the best
Grant
Washington's Comprehensive Wildlife Conservation Strategy
"The Washington Wildlife Action Plan will help conserve wildlife and vital natural areas before they become too rare and costly to protect. As our communities grow, the Wildlife Action Plan will give us the ability to fulfill our responsibility to conserve wildlife and the lands and waters where they live for future generations."

- Washington Governor Christine M. Gregoire

"Washington's Wildlife Action Plan, as well as those of the other states and territories, presents a new comprehensive vision that will change the face of wildlife conservation in North America. We are exploring new frontiers, biologically, socially and economically. In Washington, this is more than the ethic of conserving our state's biodiversity — lasting solutions to complicated natural resource issues require collaborative processes with our many conservation partners."

- Dr. Jeffrey P. Koenings, Director, Washington Department of Fish and Wildlife
strategies for action

A Comprehensive Wildlife Conservation Strategy

Each state and territory in the U.S. has developed a proactive plan to conserve wildlife species before they become too rare and before conservation actions become more costly. This is a summary of Washington's plan — the Comprehensive Wildlife Conservation Strategy (CWCS). The CWCS was approved by the U.S. Fish and Wildlife Service in October 2005. It qualifies Washington for an important new federal funding source: the State Wildlife Grants program.

The CWCS is part of Teaming with Wildlife, a broad national bipartisan wildlife conservation coalition that includes more than 3,000 organizations across the nation.

The CWCS was developed by scientists and planners, with input from conservationists, natural resource users, and the general public. Washington is one of the most ecologically diverse states in the United States. Seacoasts and estuaries, grasslands and prairies, dry shrub-steppe and various types of forest create many habitats for many species of wildlife. The CWCS provides a solid biological foundation and strategic framework for the Washington Department of Fish and Wildlife, its conservation partners and Washington residents to take action with specific action plans:

❖ To identify and safeguard wildlife and natural habitats important to many of our family traditions and for future generations.
❖ To conserve all wildlife and the habitats they live in, starting with the animals and places most in need of help.
❖ To assure that the natural habitats needed by wildlife are healthy enough to provide clean water and air for both wildlife and people.
Two of the state's ecosystems — the channeled scablands of eastern Washington and the Olympic rainforest — are found nowhere else in the world!

These varied landscapes and the animals and plants that live there create Washington's biodiversity — a natural heritage important to the long-term health and economic security of every resident of the state.

Change is normal in naturally evolving environments, but Washington's rapid human population growth and activities associated with increased economic vitality have stressed portions of our natural environment. The combined effects of multiple stressors has disrupted functioning habitats and damaged fish and wildlife populations. The CWCS recognizes this fact, but also acknowledges that both people and wildlife are vital to the Evergreen State. The CWCS seeks to guide the protection and enhancement of habitats critical to the future of our state's wildlife and thus, to our way of life.

What's at Stake

In many areas of our state, natural places are no longer able to provide for the basic needs of both people and wildlife, including clean air and water, food, and shelter. The losses and changes are considerable in urbanizing areas like the Puget Sound region, where communities are pushing out from the shoreline up into the watersheds to the very foothills of the Cascade Mountains. Wild runs of Pacific salmon used to teem throughout these watersheds, only to be threatened by land use changes and development projects. On the Columbia Plateau, much of the natural shrub-steppe and grasslands are now growing food for people rather than for native wildlife such as the greater sage-grouse. A new threat has emerged from invasive plant and animal species that have no natural enemies, and thus expand rapidly into new areas every year. They are a common enemy to native wildlife and upland farmland, as well as commercial shellfish.

The stakes are high, but responding to change is the Washington way. Moving Washington forward requires a focused effort — and that focal point is the CWCS. The CWCS recognizes that fragmented upland habitats can be enlarged, riparian areas can be restored, estuarine nearshore can be functional, and water can be cool and clean. It also recognizes that people will continue to raise families in and around these habitats. And that a balance needs to be created between the two.
<table>
<thead>
<tr>
<th>COMPREHENSIVE WILDLIFE CONSERVATION STRATEGIES</th>
<th>CWCS ACTIONS</th>
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<tr>
<td><strong>Leave no species behind</strong></td>
<td>✓ Identify Species of Greatest Conservation Need</td>
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<td>✓ Determine priority habitats</td>
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<td>✓ Identify the most serious conservation problems</td>
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<td>✓ Identify the most effective conservation actions</td>
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<td><strong>Build a plan of plans</strong></td>
<td>Review and synthesize hundreds of conservation plans that provide information and recommendations for priority wildlife species and the habitats upon which they depend.</td>
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<td><strong>Partners:</strong></td>
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<td><strong>Strengthen conservation partnerships</strong></td>
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<td><strong>Emphasize biodiversity conservation</strong></td>
<td><strong>Coordinate development and implementation of the CWCS with the Washington Biodiversity Council.</strong></td>
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<td>Identify, protect and restore areas that support the greatest diversity of wildlife.</td>
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In keeping with WDFW's mission, the CWCS focuses on animals and animal habitat diversity. It does not directly address rare plants, plant associations or landscape features that are protected by the Washington Department of Natural Resources Natural Heritage Plan.
Protect the wildlife and habitats most in need of help, while working to keep common species common

Species of Greatest Conservation Need

Washington's list of 193 Species of Greatest Conservation Need (SGCN) is the driving force behind the CWCS. It builds on current efforts to protect fish and wildlife species, including those listed on state and federal endangered, threatened and sensitive species lists. It also includes species not yet listed but for which conservation actions or additional information is needed. Life history details and other information about all wildlife on the SGCN list are included in the full CWCS text.

Priority Habitats

The CWCS includes habitats that are crucial for the conservation of at-risk wildlife species and for keeping common species common. This list of 20 habitats was developed using two detailed scientific assessments (the WDFW Priority Habitats and Species list and Wildlife Habitat Relationships in Oregon and Washington), as well as the list of Species of Greatest Conservation Need.

Some examples of Species of Greatest Conservation Need and their associated priority habitats are shown in photos throughout this booklet.
Greatest Conservation Challenges

- Reverse habitat loss due to conversion, fragmentation, and degradation.
- Curb the spread of invasive alien plant and animal species.
- Improve the diversion and allocation of surface water to leave more water for fish and wildlife.
- Improve water quality.
- Recover salmon populations.
- Implement updated forest conservation and management practices.
- Implement updated agricultural and livestock grazing practices.
- Reverse the spread of plant and animal diseases and pathogens.
- Improve our knowledge of wildlife species, populations and habitats.

Most Effective Conservation Actions

- Conserve and restore habitat on public, private and tribal lands.
- Implement species conservation strategies and coordinated salmon recovery plans.
- Ensure that local, state and federal laws are implemented to protect fish, wildlife and habitat.
- Conduct biological assessments, research, surveys and monitoring of fish, wildlife and habitat.
- Identify scientific information for local governments and planners.
- Expand wildlife information and conservation education programs.
Top Conservation Challenges

Habitat loss through conversion, fragmentation, and degradation

Habitat loss through conversion to other uses, fragmentation and degradation is the most serious statewide threat to Washington’s native fish and wildlife. More than half the state’s highest priority wildlife habitats have been lost since statehood in 1889. Once native habitat is converted to other uses, remaining habitat is left as isolated fragments in a maze of multiple land uses. Wildlife populations associated with these fragmented habitats may be blocked from their normal movement patterns and migration routes, and isolated from other breeding populations. Thirty thousand to 80,000 acres of functional habitat for wildlife are lost or altered every year.

Invasive alien plant and animal species

Invasive, non-native plants and animals outcompete and displace native species, profoundly changing natural systems. Invasive alien species evolve in other parts of the world and arrive in Washington without the natural predators and diseases that control their growth in their native environment. This is a critical problem for native fish, wildlife and biodiversity, and for our vital agricultural industry.
**Cordgrass** (*Spartina*) outcompetes and eliminates native salt marsh vegetation and fills in tidal mudflats, which are important habitat for native salmon, shellfish, shorebirds and other migratory bird populations. *Spartina* infestations are present in Willapa Bay, and are gaining a foothold in the inland marine waters of Puget Sound.

**Cheatgrass** has replaced native grassland communities all over the Intermountain West, including Washington. Originally from Asia, it has limited or no food value for wildlife and livestock and is a major fire hazard in shrub-steppe deserts and ponderosa pine forests.

**Bullfrogs** have a severe impact in freshwater habitats on declining species such as western pond turtles, northern leopard frogs, and other native amphibian, fish and even bird species.

Other alien invasive species include, but are not limited to: Japanese eelgrass, oyster drill, varnish clam, European green crab, yellow starthistle, knapweed species, Dalmatian toadflax and sulfur cinquefoil.

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**Effective Conservation Actions**

**Identify scientific information for local governments and planners.**

The CWCS identifies the types of reliable landscape-scale data and biological information needed by local governments for good decision-making to conserve important wildlife habitat, protect natural areas critical for clean air and water, and administer the state Growth Management Act and other locally administered land use laws.

**Enhance and conserve habitat on public, private, and tribal lands and waterways.**

The CWCS includes specific conservation and acquisition recommendations for each priority habitat type. These recommendations will be used to:

- Make up-to-date management decisions on the statewide network of more than 840,000 acres owned or managed by WDFW.
- Help WDFW improve its role in providing other public agencies with wildlife information and habitat recommendations for the lands they manage. Forty percent of Washington's land base is in public ownership.
- Work with Indian tribal councils to identify and conserve important wildlife habitat on tribal lands. About 16% of Washington is within tribal reservations.
- Boost financial and non-financial incentives for private landowners and provide technical assistance for private conservation organizations, county extension agents, and conservation districts. Approximately 60% of Washington's land base is privately owned.
In 1990, at the urging of the Washington Wildlife and Recreation Coalition, the Legislature created the Washington Wildlife and Recreation Program (WWRP). This program makes grants to state and local government entities to permanently protect habitat and recreational lands across the state. The program has made over $450 million available and funded 775 projects. The WWRP has enabled the Washington Department of Fish and Wildlife (WDFW) to acquire more than 80,000 acres of critical habitat to support species such as sharptail grouse, pygmy rabbits, salmon, elk, deer and upland game.

Land acquisition is a powerful conservation tool that entails more than just the fee title purchase of lands; it also includes conservation easements and other types of landowner agreements. In order to better articulate the relationship between land acquisition and conservation goals, WDFW published Lands 20/20: A Clear Vision for the Future in July, 2005. Lands 20/20 clearly defines those values by which WDFW will make land acquisition decisions in the future, and lays out a process that incorporates scientific review and public involvement.

Lands 20/20 recognizes the legacy established by WDFW after 70 years of acquiring lands for fish and wildlife and related recreation. It also recognizes acquisition as just one conservation tool, and that to be truly successful, conservation of Washington's remaining fish, wildlife and habitat will require public understanding and support of many different conservation strategies. These strategies are outlined in Washington's Comprehensive Wildlife Conservation Strategy (CWCS). Lands 20/20 also utilizes the CWCS to inform the acquisition process and to place it in the context of other conservation tools.

- Identify areas with high habitat or biodiversity values that can best be conserved through fee-title acquisition, land donations, land trades, or conservation easements.

Implement species conservation strategies and coordinated salmon recovery.

The CWCS focuses attention on wildlife species included on the statewide Species of Greatest Conservation Need (SGCN) list. A range of conservation actions is recommended for these species, from the development of recovery plans for wildlife most in need of help, to baseline population surveys for other species.

Large-scale, coordinated salmon recovery efforts are well underway in Washington. The CWCS does not duplicate these efforts, but implementation of the CWCS will enhance salmon recovery by focusing on priority habitats throughout the state.

Expand wildlife information and conservation education programs.

Effective conservation of habitat and biodiversity can only be accomplished if the public and policy makers understand the biological needs of wildlife. The CWCS identifies a wide range of necessary education and information actions.

Conduct biological assessments, research, monitoring and surveys of fish, wildlife and habitat.

The CWCS recommends targeting areas where knowledge should be improved to ensure that conservation priorities and programs reflect the current needs of wildlife and habitats.
Ensure implementation of local, state, and federal laws to protect fish, wildlife and habitat.

The CWCS recommends enhanced enforcement of existing harvest and habitat laws, as well as partnerships with other agencies to publicize and implement laws, regulations, and permit conditions that prevent the destruction or degradation of important habitat.

Building a Plan of Plans

WDFW and its many partners are involved in a range of conservation planning and assessment efforts for fish and wildlife species, habitats, and biodiversity. This work was accomplished through collaboration among policy makers, years of field investigation and analysis by scientists, and input from the public. Some of these efforts are management and recovery plans for individual species such as salmon or lynx. Others focus on managing certain types of habitat. Others address biodiversity statewide. We consulted many plans and assessments to build the CWCS on a solid foundation of both previous and ongoing work, including:

Ecoregional Assessments

Ecoregional assessments (EAs) address species and habitat conservation targets and map biodiversity for each of Washington's nine ecoregions. The CWCS incorporates the results of the EAs to enable us to address biodiversity needs on a landscape scale, as well as problems and management priorities that vary throughout the state.

Ecoregions are broad ecological patterns in the landscape. Each ecoregion has a unique combination of soils, geology, hydrology and climate that in turn create the right conditions for unique plant communities and wildlife. Washington has nine ecoregions, ranging from the marine-influenced lowlands of the Puget Trough to the dry shrub-steppe of the Columbia Plateau.

Washington Natural Heritage Plan

This program provides the framework for a statewide system of state-owned natural areas that provide habitat for rare and declining species and places for healthy, functioning ecosystems.

Other plans include:

- Northwest Forest Plan
- Northwest Power and Conservation Council subbasin plans
- Puget Sound Water Quality Management Plan
- Salmon recovery plans and assessments
- Washington GAP Project
- WDFW Wildlife Area Plans
From the Bottom Up

Washington Department of Fish and Wildlife staff and local stakeholders are building on CWCS strategies by implementing a Wildlife Action Plan in each of Washington’s nine ecoregions. These people have the localized knowledge and expertise to determine conservation priorities for their ecoregion.

**Action #1. Determine which species, habitats and landscapes represent the greatest conservation opportunities for each ecoregion.**

Drawing on the CWCS toolbox, they will work at three scales. First, they will use the statewide list of Species of Greatest Conservation Need and species recovery plans to determine priority species for their ecoregion. Working at the landscape scale, they will consult Ecoregional Assessments and specialized maps to identify areas of highest biodiversity. Finally, they will examine the CWCS list of priority habitats to make sure that “all the bases are covered.”

**Action #2. Identify specific actions needed to realize ecoregional conservation opportunities.**

Next, each group will consider conservation challenges identified in the CWCS and evaluate conservation actions already underway by WDFW and other agencies and organizations. They will conduct a “gap analysis” to determine what still needs to be done. And they will explore ways to create corridors of connectivity between protected landscapes.

**Action #3: Activate partnerships; identify conservation roles.**

Although WDFW has primary responsibility for wildlife conservation in Washington, implementing the Wildlife Action Plan will require the cooperation and active participation of the public as well as other agencies and conservation organizations. WDFW will work with these conservation partners to prioritize on-the-ground actions and identify roles for each partner.
From the Top Down

Secure adequate funding for wildlife conservation

The Washington Department of Fish and Wildlife (WDFW) will work closely with other state wildlife agencies and the nationwide Association of Fish and Wildlife Agencies to get the CWCS in the hands of state, federal and local decision-makers, business interests, the conservation community and the general public. In particular, WDFW will make copies of the CWCS available to members of Congress and federal agency administrators who will help provide the necessary funding to implement the Wildlife Action Plan.

Emphasize biodiversity conservation

The Washington Biodiversity Council is developing a proactive blueprint for Washington’s first-ever biodiversity strategy. This 30-year vision will include a strategy for educating the public about biodiversity and will incorporate statewide and ecoregional priorities and benchmarks for conservation of land and water (both fresh and marine).

Implementation partners

- USDA Forest Service
- U.S. Fish and Wildlife Service
- Bureau of Land Management
- Bureau of Reclamation
- Department of Defense
- National Park Service
- Washington Department of Natural Resources
- Washington State Parks and Recreation Commission
- Tribal land management agencies
- Private forest landowners
- Local governments
- Local conservation districts, irrigation districts, and weed boards.

Other public and private conservation partners:

- Governmental partners who establish policy, administer programs and regulations, or direct funding to wildlife conservation include the National Marine Fisheries Service, Northwest Power and Conservation Council, Salmon Recovery Funding Board, Puget Sound Action Team, and Washington Departments of Ecology and Transportation.

- Nonprofit conservation and wildlife recreation groups such as The Nature Conservancy, Audubon Washington, People for Puget Sound, Cascade Land Conservancy, Trust for Public Land, Washington Wildlife Federation, Trout Unlimited, Ducks Unlimited, Rocky Mountain Elk Foundation, and local land trusts.
Detailed implementation

The CWCS is a dynamic planning strategy designed to be continually examined, refined and adapted to meet changing circumstances. The WDFW, with advice from its public and private partners, will carry on this effort. They will:

- Continue to re-examine and refine the relative priority of wildlife species and associated habitats.
- Integrate the CWCS into the 30-year Biodiversity Conservation Strategy currently being crafted by the new Washington Biodiversity Council.
- Coordinate multi-agency land acquisition with other state and local agencies through the Interagency Committee for Outdoor Recreation (IAC).
- Accelerate coordinated planning for species and habitat conservation among federal and state land management agencies.
- Complete local habitat assessments and develop new and better databases and mapping products for local governments to use in Growth Management Planning.
- Better integrate management of marine and aquatic ecosystems with terrestrial ecosystems, both within WDFW and among state and federal agencies.
- Incorporate identified species and habitat conservation priorities into operational work plans within WDFW and other conservation partners.
- Incorporate specific conservation actions into WDFW's cost accounting systems to help develop and monitor project budgets and priorities.

What role does science play in wildlife and biodiversity conservation?
- Identifies what should be conserved.
- Determines how it should be conserved.
- Measures and monitors the effect of conservation actions.

What role do Washingtonians play in wildlife and biodiversity conservation? They use the science to influence or decide:
- How much wildlife and biodiversity should be conserved.
- Where wildlife habitat should be conserved.
- How much money and other public resources should be applied to conservation.
Washington Department of Fish and Wildlife

The Washington Department of Fish and Wildlife has a responsibility to protect our state’s unique legacy. The Comprehensive Wildlife Conservation Strategy and Wildlife Action Plan outlined in this executive summary are integral to the preservation of our rich natural heritage for current and future generations.

For more information and access to the full CWCS in PDF format, go to:

http://wdfw.wa.gov/wlm/cwcs
“In the end, we will conserve only what we love;
We will love only what we understand;
We will understand only what we have been taught.”

- Baba Dioum, Senegalese ecologist
What is a Watershed?

A watershed is a topographically defined area of land where the water within flows to a common point. Within a watershed, surface and groundwater are generally connected as water flows across the landscape through waterways or vertically through the various layers of soil and substrate. This movement of water across and through the landscape connects an area hydrologically.

Any activity that affects water quality, quantity, or flow rate in one part of the watershed may affect locations downstream. Understanding this connectivity within a watershed is helpful when planning or managing activities for the future. For this reason, to protect our water it makes sense to protect our watersheds.

Why use watershed boundaries?

A watershed-based approach to land and water management provides benefits that include: understanding how activities on the landscape influence water quality and quantity, fostering a connection to the landscape we live in, and ensuring activities upstream are respectful of downstream residents.

The Manitoba government has adopted this watershed-based planning philosophy and is working with water planning authorities, such as Conservation Districts, to lead planning efforts.

Effective integrated watershed management planning is important in managing water and land development and maintaining a healthy and sustainable watershed community.
The Importance of Planning

Watershed groups have found a long list of economic, administrative, and ecological benefits to planning, including:

- helping local boards prioritize limited resources
- giving community members an active voice in protecting and restoring watershed resources that are important to them
- providing greater access to a number of resources for project implementation
- targeting activities and programs to areas that need greater protection, or to areas where limited resources will be most effective
- setting a baseline for measuring the success of management efforts
- reducing costs of remedial actions by preventing future problems

What is an Integrated Watershed Management Plan?

An integrated watershed management plan (IWMP) is a document developed cooperatively by government and stakeholders (watershed residents, interest groups). It states shared goals and outlines actions to manage land, water and related resources on a watershed basis.

What Makes a Plan Integrated?

Watershed management plans are considered integrated because:

- the planning process is inclusive and broad, and combines the needs of diverse watershed stakeholders
- there is a recognition of the balance between ecosystem, community and economic health
- the process respects the integration of activities on the land and their impact on water

The Water Protection Act (2006) is enabling legislation that guides watershed planning and provides the basis for launching and financing an IWMP. The Act also includes provisions intended to ensure plans are linked to local development plans, further integrating water and land planning activities.

The Purpose of IWMP

The purpose of an IWMP is to identify priority land and water-related issues in the watershed, determine projects or policies targeted to address the issues, and identify how land and water management programming will be cooperatively carried out throughout the watershed.
What is the Planning Process?

There are several key groups that are critical to developing a successful plan:

**Water Planning Authority (WPA):** The group that takes on the responsibility to develop an IWMP. The WPA must complete an IWMP in accordance with The Water Protection Act.

**Project Management Team (PMT):** This PMT is a small group of key decision makers appointed by the WPA to represent the interests of all watershed stakeholders. People on this team should include a representative from the WPA, those who have a special interest in the development of this plan, and a watershed planner. The PMT typically meets monthly during the development of a plan. Once a plan is implemented, the PMT is responsible for ensuring the plan is monitored and evaluated, and reporting that progress back to the Watershed Team.

**Watershed Team:** This group can be large (30 to 50 people) and is selected by the PMT. This team should include a diverse and committed group of people who represent stakeholder groups, or people who can contribute technical information about the watershed. The Watershed Team meets three to four times throughout a plan’s development.

The adjoining table outlines the steps involved in each of the three main phases of the IWMP process (pre-planning, planning, and implementation). The IWMP process takes one to two years, and is thoroughly revised every eight to 10 years.

---

**Pre-Planning**

Once your group has decided to take part in the planning process there are a few pre-planning steps to follow:

1. **Talk to your regional watershed planner about your intent and their availability.**
2. **Write a letter to your regional watershed planner that includes a request to initiate an IWMP, including a resolution of support.**
3. **Gain status as a WPA through signing a memorandum of understanding between your watershed group and the Minister of Water Stewardship.**
4. **Form a balanced Project Management Team (PMT) to fairly represent your group.**
5. **Set the terms of the plan. The terms should include the purpose of the plan, a schedule, an outline of the roles and responsibilities for team members, and a proposed budget.**

**Planning**

1. **Host public meetings at locations throughout the watershed to gain input on local issues.**
2. **Host a Watershed Team Meeting to share and review the public input on issues.**
3. **Compile watershed characterization and an outline of the action plan.**
4. **PMT will prepare and compile a rough outline of watershed plan to present to the group.**
5. **Host a second Watershed Team meeting to discuss stakeholder commitments.**
6. **Write a draft plan.**
7. **Host a third Watershed Team meeting to review budgets, measures of success and a timeline.**
8. **Host a public presentation and review.**
9. **Finalize IWMP and submit to minister.**

**Implementation**

1. **Implement actions and policies from IWMP.**
2. **Monitor and evaluate actions.**
3. **Revise plan.**
What does it cost to develop a plan?

Each WPA is provided with a watershed planning grant of $25,000 to offset expenses related to the development of the plan.

WPA expenses include printing costs, consultant fees, meeting fees (room bookings, refreshments, etc.).

In-kind support makes up the bulk of the costs when developing a plan. Each team member involved in the plan will dedicate valuable time, or in-kind support, to this effort. The value of this professional input can range from $100,000 to $200,000, provided at no cost to the WPA. Costs for developing an integrated watershed management plan are separate from the costs necessary to implement the plan.

Plan implementation is funded through many sources. Manitoba Water Stewardship supports plan implementation through the Conservation Districts Program. Other departments, organizations and individuals all contribute support as they begin initiating plan actions.

Contact Us

The Watershed Planning and Programs section of Manitoba Water Stewardship is available to assist groups to develop an integrated watershed management plan.

Your regional watershed planners can be reached at the following locations:

**Brandon**
Box 13 - 1129 Queens Avenue
Brandon, MB
R7A 1L9
Ph: 204-726-6633

**Dauphin**
Box 9, Room 225
27 2nd Avenue SW
Dauphin, MB
R7N 3E5
Ph: 204-622-2069

**Neepawa**
Box 20,000, 123 Main Street
Neepawa, MB
R0J 1H0
Ph: 204-476-7033
Ph: 204-476-7036

**Steinbach**
Unit B - 284 Reimer Avenue
Steinbach, MB
R5G 0R5
Ph: 204-346-6115

**Winnipeg**
Box 11 - 200 Saulteaux Crescent
Winnipeg, MB
R3J 3W3
Ph: 204-945-7408
Ph: 204-945-5461
Ph: 204-945-6392
UNESCO to the rescue

Site C would have far-reaching impacts all the way downstream to the Peace Athabasca Delta, a UNESCO World Heritage Site and home to at-risk species such as the Whooping Crane and the Wood Buffalo. The delta is already suffering from dramatically altered river flows caused by the W.A.C. Bennett and Peace Canyon dams. Adding Site C would be the "straw that breaks the camel's back," according to hydrological expert Dr. Martin Carver.

The Canadian government would be deeply shamed if such harm to a World Heritage Site were to happen on Prime Minister Trudeau's watch. In September, UNESCO is sending an investigative mission to Canada to hear from affected First Nations and other residents, as well as scientists and NGOs.

Sierra Club BC is working closely with the Mikisew Cree First Nation to ensure the UNESCO mission receives intense international scrutiny and media attention. This will give a strong boost to the avalanche of letters, petitions, calls and messages (over 45,000!) from citizens asking Prime Minister Trudeau to put a moratorium on Site C.

How you can help

- Contact Prime Minister Trudeau and Cabinet and remind them of their promises to honour the treaties. The very least they can do is put a moratorium on Site C to allow time for the First Nations legal challenges.
- Support our work. We're fighting for the Peace on all fronts - in the courts, in the media, and by engaging people in communities across BC. Every donation, no matter what size, stretches our reach.

Donate at sierraclub.bc.ca/donate

At Sierra Club BC we're inspiring generations to defend nature and confront climate change, so families, communities and the natural world can prosper together.

Find out more at sierraclub.bc.ca
Site C fails First Nations

The Peace Valley is one of the few remaining places where Treaty 8 First Nations can hunt, fish and engage in cultural activities to maintain their identity and connection to the land.

If built, Site C dam will flood 107 kilometres of the Peace River and its tributaries, including critical hunting grounds. It will contaminate fish. Site C will also obliterate hundreds of graves and ceremonial sites and directly hinder Treaty 8 First Nations' cultural and ceremonial practices.

The West Moberly and Prophet River First Nations are challenging Site C in court. If Canada is serious about reconciliation and a new relationship with First Nations we must not allow Site C to wreak more destruction on their land and culture.

Site C would destroy land we need to grow food

The Peace valley is a unique food oasis in the middle of the boreal forest. Farm families in the Peace are able to grow high-yielding tomatoes, peppers, cantaloupes and melons. Except for the Peace valley, none of these heat-loving crops can be grown north of Quesnel.

British Columbia is highly dependent on food imports from California and other areas that are experiencing a megadrought and a loss of agricultural production. There are many ways to produce power, but only 5 per cent of the B.C. land base is suitable for agriculture.

"The land to be flooded is capable of providing fruits and vegetables to meet the nutritional requirements of one million people - every year, forever"

-Wendy Holm, agrologist presentation to the Joint Review Panel

Power we don't need at a price we can't afford

"With Site C, BC Hydro ratepayers will be facing a devastating increase of anywhere between 30 and 40 per cent over the next three years."

- Former BC Hydro CEO Marc Eliesen

At $8.8 billion and counting, Site C is the most expensive public project in B.C. history. Despite the hefty price tag, the B.C. government has never investigated alternative options.

Demand for power has been falling since 2008. BC Hydro's own figures anticipate falling demand from industrial users. A recent investigation by DeSmog Canada has revealed that BC Hydro is paying independent power producers not to produce electricity due to oversupply.

The government's decision to commit nearly $9 billion of taxpayers' dollars to Site C without an independent review of cost and need is currently being investigated by the BC auditor-general's office.
A GUIDE TO MAJOR HYDROPOWER PROJECTS OF THE COLUMBIA RIVER BASIN
The Columbia River Basin (in Canada and the United States) is 671,000 square kilometres, or about the same size as the province of Alberta. It contains an incredible range of ecosystems including interior rain forests, grasslands, and deserts. The Columbia Basin is home to a huge diversity of wildlife with over 700 species of reptiles, birds, fish, and mammals.

According to archaeologists, humans have inhabited the Columbia River Basin for more than 10,000 years.

The Columbia River was visited by Robert Gray, an American explorer in 1792 and is named after his vessel, the Columbia. The River begins its 2000 kilometre journey at Columbia Lake near Canal Flats, BC and flows through British Columbia, Washington and Oregon before it enters the Pacific Ocean, west of Portland, Oregon.

Not long after Northwest pioneers established the first cities in the Basin, they began to use the river to make electricity for their homes and industries. The T.W. Sullivan Dam in Oregon City was the first hydroelectric dam in the lower Columbia Basin. It was built in 1888. The first hydroelectric dam built in the Canadian portion of the Columbia River system was the Lower Bonnington, built in 1897 on the Kootenay River.

Most of the dams on the Columbia River were built between 1900 and 1980. Currently there are more than 450 dams (hydropower, agriculture and municipal) on the Columbia mainstem and its tributaries, making it the most dammed river in the world.

The economies of the Pacific Northwest United States and British Columbia are dependent on the power and revenue generated from the hydroelectric system in the Columbia Basin.

The Canadian Columbia Basin region provides 50 percent of the total hydroelectric power produced in British Columbia. Power produced as a result of this hydroelectric infrastructure fuels the provincial economy and provides low-cost electricity to all British Columbians.

The water stored in the Canadian system provides significant additional power generation to a number of US hydroelectric facilities downstream on the Columbia River. Today, the American Northwest relies on hydropower for about two-thirds of its electricity, and 40 percent of all US hydropower comes from the Columbia River system.

The increase of human population in the Basin has placed a greater demand on the water resources, not only for hydroelectric generation, but also for industry, agriculture, and recreation. This increase in demand for water has placed a higher level of regulation on the Columbia River and its tributaries. The variety of national, provincial, First Nations, and state jurisdictions increase the complexity of managing the system.

COLUMBIA RIVER TREATY

Canada and the United States were facing two major challenges in the Columbia Basin after the Second World War – the "untamed" Columbia River caused periodic and sometimes devastating flooding and an upswing in the economy increased the need for more energy.

In 1964, Canada and the United States ratified the Columbia River Treaty (CRT). The purpose of the CRT is to coordinate flood control and optimize electrical energy production in the Columbia River Basin in the United States and Canada. Under the CRT, Canada agreed to build three storage dams – Duncan (1968), Hugh Keenleyside (1969), and Mica (1973) – in the Columbia Basin. The CRT allowed for a fourth dam – Libby Dam (1974) to be built in the United States.

In return for the storage of water, Canada is entitled to one half of the additional power generated at the American power plants on the Columbia River. The Province of BC, which owns this "Canadian Entitlement of Downstream Benefits", sold the first 30 years of these benefits to a group of US utilities for $254 million. The province is now receiving the Canadian Entitlement for the remaining 30 years of the CRT. Although there is no official "expiry date" for the CRT, there are provisions for renewal, termination, or renegotiation after 60 years (2014), if 10 years notice is given (2004). Regardless of termination of the CRT, Canada is obligated to continue to provide flood control, when called upon, as long as the three CRT dams are in operation.
Hydropower Dam Glossary

Ancillary services are those services that are required to support transmission of capacity and energy from resources to loads, and to maintain reliability.

Anadromous fish that migrate from the sea to fresh water to spawn.

Available transfer capability (ATC) a measure of the transfer capacity remaining in the physical transmission network for further commercial activity, over and above already committed uses.

British Columbia Utilities Commission (BCUC) an independent regulatory agency of the provincial government operating under and administering the Utilities Commission Act. Primary responsibility is the regulation of the energy utilities under its jurisdiction to ensure that the rates charged customers for energy are fair, just, and reasonable. Required to ensure that utility operations provide safe, adequate, and secure service to their customers. Approves the construction of new facilities planned by utilities and their issuance of securities.

Bypass system, bypass channel a structure in a dam that provides a route for fish to move through or around the dam without going through the turbine units. The bypass channel is the part of a system that includes a conduit built into the dam to pass fish.

Capacity the maximum sustainable amount of power that can be produced or carried at any instant.

Columbia River Treaty is a bi-national treaty between Canada and the US, signed in 1964, and ratified in 1964, under which three dams were built in British Columbia for flood control and power production.

Dam a barrier across a river designed to control water flow and/or form a reservoir.

Distribution a low voltage transmission network, usually below 6,000 volts, for delivering electricity to customers' premises.

Downstream benefits are the additional power generated in the United States as a result of the operation of three storage dams (Mica, Hugh Keenleyside, Duncan) built in British Columbia. BC is entitled to one-half of the downstream benefits.

draft the release of stored water from a reservoir.

drawdown releasing water from a hydroelectric project to lower the reservoir elevation. Drawdowns are used for energy production or to create additional space in the reservoir to hold back floodwaters; to reduce the cross-sectional area of the reservoir, increasing the current to aid downstream fish passage; and to expose normally submerged structures for maintenance.

drawdown/drafting the distance that the water surface of a reservoir is lowered as water is released from the reservoir.

electricity demand the amount of electricity required by consumers or by the system.

Energy capability the amount of energy the electric system can produce over a given time.

Firm energy the assured energy contribution of the electric system over one year.

Firm transmission service transmission service that is reserved and/or scheduled with a priority that will not be interrupted for economic reasons.

Fish ladder a series of ascending pools, similar to a staircase, that enables fish to migrate up a river past dams. Also called a fishway.

Flow release the release of water through a hydroelectric facility at a prescribed flow rate.

Forebay the part of a dam's reservoir that is immediately upstream of the powerhouse.

Freshet the rise in streamflow caused by rain or snowmelt.

Full pool maximum reservoir operating level permitted in the water license.

Gatewell the slot on the upstream face of a concrete dam where hydraulic gates are stored when not used to close the turbine intakes. (The gatewell also typically houses the fish screening device.)
generator a machine that converts mechanical energy into electric energy.
generating capacity the maximum power that a power plant, such as a hydroelectric dam, can produce under specific conditions.
gigawatt-hour (GW.h) one million kilowatt-hours.
gigawatt-hours per annum (GW.h/a) the number of gigawatt-hours produced by the electric system in one year. One GW.h will serve about 100 residential customers for one year.
grid network of transmission lines.
head (hydraulic head) the vertical distance between the water level in the reservoir above a generating station, and the water level immediately below the turbine outlet. Power output is proportional to head.
headpond small reservoir.
hydraulic capacity the maximum amount of water that goes through the powerhouse at a project.
hydroelectric the production of electricity using the power of falling water or streamflow.
independent power producer (IPP) an entity which produces electricity for market to utilities or other customers, and is not governed by utility regulations.
inflow water that flows into a reservoir.
intake the entrance to a turbine unit at a hydroelectric dam.
kilovolt (kV) one thousand volts.
kilowatt (kW) one thousand watts; the commercial unit of electric power. A kilowatt is the flow of electricity required to light ten 100-watt light bulbs.
live storage water storage that can be released from the reservoir.
load centre the region where the majority of electricity customers are located.
load forecasting the determination of an estimate of average and maximum load requirements for some future time.
lock a chamber with watertight gates at each end used to lift or lower watercraft between the downstream tailrace water level and the upstream reservoir level.
long-term transmission service transmission service that is reserved and/or scheduled for one year or longer.
mainstem the main channel of the river, as opposed to the streams and smaller rivers that feed into it. In the fish and wildlife program, mainstem refers to the Columbia and Snake rivers.
megawatt (MW) one thousand kilowatts. This term is commonly used to measure the capacity of generating stations; also the rate at which energy can be delivered.

network integration transmission service a transmission service that allows the transmission customer to integrate, plan, economically dispatch, and regulate its network resources to serve its network load, both of which are distributed within a service area.
non-firm transmission service point-to-point transmission service that is scheduled and paid for on an as available basis and is subject to interruption.
non-power those features of electric system operations that are not related to the production of electricity.
peak capacity the maximum amount of electrical power that generating stations can produce in any instant.
penstock the tube through which water flows from the reservoir to the turbines in a hydroelectric generating system.
point-to-point transmission service the reservation and/or transmission of energy on either a firm basis and/or a non-firm basis from point(s) of receipt to point(s) of delivery.
power the rate of delivery of energy measured in watts.
powerhouse the building or structure containing generators and accessory equipment, and where power is produced by the action of water on the turbine blades.

pumped storage a hydroelectric project designed to store electrical energy on a short-term basis. A pumped storage project is typically used to store electricity during nighttime periods of low demand for use during daily peak demand periods.

real time pricing market-based electricity prices for consumption at a customer's base load.

reservoir the lake or body of stored water formed by a dam.

river basin the geographic area drained by a river.

river miles miles calculated from the mouth of the river or, for upstream tributaries, from the confluence with the main river.

run-of-river a hydroelectric facility that operates using only available stream flow. This means they also have limited control of their outflow and power generation.

short-term transmission service transmission service under WTS that is reserved and/or scheduled for a term of less than one year.

spillway a channel designed to collect ice and trash in the river (e.g., silt) before they get into the turbine units and cause damage.

spill, spillbay releasing water out the spillbays rather than through turbine units. The spillbay is the dam's safety valve. Without it, excess water can damage the dam's structure or overflow the dam. Dams without bypass systems spill water laden with fish to carry them away from turbines.

torage the water held in a reservoir for power generation or flood control.

torage dam a dam with a large reservoir that can hold water over the annual high-water season to the following low-water season.

streamflow the rate at which flowing water passes a given point, measured in cubic feet per second (cfs) or cubic metres per second (m³/s).

substation an electrical switching station to terminate transmission lines and/or a station at which transmission voltage is reduced to a level suitable for subtransmission or distribution systems.

synchronous condenser a motor or generator operated at synchronous speed to provide voltage support.

system control centre the central location for supervisory control of the generation and transmission systems.

tailrace the channel through which water exits a powerhouse.

tailwater the water surface immediately downstream from a dam.

thermal generation the generation of electricity by means of the conversion of heat energy into electric energy; generation through the burning of fossil fuels or biomass.

time-shift the use of reservoir storage and peaking capability of hydroelectric systems to store water when available and generate electricity when needed.

total transfer capability (TTC) the amount of electric power that can be transferred over the interconnected transmission network in a reliable manner while meeting all of a specified set of defined pre- and post-contingency system conditions.

transmission the transportation or conveyance of electricity in bulk at voltages over 60 kV.

turbine a rotary device caused to turn by the movement of gases, steam or water.

unbundling the separation of various services associated with power delivery.

water licences a legal document issued by the Water Management Branch which specifies the terms and conditions under which a right to use water is granted.

Western Systems Coordinating Council (WSCC) the body that sets electric system operating performance and reliability standards for members in western Canada and US.
## Canadian Hydropower Projects

<table>
<thead>
<tr>
<th>Name</th>
<th>Completed</th>
<th>Operator</th>
<th>Type</th>
<th>Location</th>
<th>Generating Capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kootenay Canal</td>
<td>1976</td>
<td>BC Hydro</td>
<td>Powerhouse</td>
<td>Kootenay River 20 km W of Nelson</td>
<td>580</td>
</tr>
<tr>
<td>Seven Mile</td>
<td>1979</td>
<td>BC Hydro</td>
<td>Run of river reservoir, concrete gravity dam</td>
<td>Pend d'Ortrie River 20 km SE of Trail</td>
<td>790</td>
</tr>
<tr>
<td>Mica Dam</td>
<td>1973</td>
<td>BC Hydro</td>
<td>Earth fill dam</td>
<td>Columbia River 135 km N of Revelstoke</td>
<td>1805</td>
</tr>
<tr>
<td>Revelstoke</td>
<td>1983</td>
<td>BC Hydro</td>
<td>Concrete gravity dam</td>
<td>Columbia River Lake Revelstoke</td>
<td>1980</td>
</tr>
<tr>
<td>Spillimacheen</td>
<td>1955</td>
<td>BC Hydro</td>
<td>Run of river with small dam</td>
<td>Spillimacheen River 49 km N of Radium</td>
<td>4</td>
</tr>
<tr>
<td>Duncan</td>
<td>1967</td>
<td>BC Hydro</td>
<td>Storage facility earth fill dam</td>
<td>10 km N of N end of Kootenay Lake</td>
<td></td>
</tr>
<tr>
<td>Aberfeldie</td>
<td>1932, rebuilt 1953</td>
<td>BC Hydro</td>
<td>Run of river concrete gravity dam</td>
<td>Bull River 30 km E of Cranbrook</td>
<td>5</td>
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<tr>
<td>Elko</td>
<td>1924</td>
<td>BC Hydro</td>
<td>Run of river</td>
<td>Elk River 70 km SE of Cranbrook</td>
<td>12</td>
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<tr>
<td>Brilliant</td>
<td>1944</td>
<td>CPC/CBTC</td>
<td>Concrete gravity</td>
<td>Kootenay River at Castlegar</td>
<td>145</td>
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<tr>
<td>Hugh Keenleyside</td>
<td>1968</td>
<td>BC Hydro</td>
<td>Earth and concrete structure</td>
<td>Arrow Lakes Reservoir &amp; W of Castlegar</td>
<td></td>
</tr>
<tr>
<td>Arrow Lakes</td>
<td>2002</td>
<td>CPC/CBTC</td>
<td>Run of river, concrete dam</td>
<td>Adjacent to Hugh Keenleyside Dam near Castlegar</td>
<td>185</td>
</tr>
<tr>
<td>Generating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walter Hardman</td>
<td>1960's</td>
<td>BC Hydro</td>
<td>Run of river</td>
<td>Shore of Arrow Lakes reservior - 30 km S of Revelstoke</td>
<td>8</td>
</tr>
<tr>
<td>South Slocan</td>
<td>1918</td>
<td>FortisBC</td>
<td>Concrete gravity dam run of river</td>
<td>Kootenay River</td>
<td>57</td>
</tr>
<tr>
<td>Upper Bonnington</td>
<td>1907</td>
<td>FortisBC</td>
<td>Concrete gravity dam run of river</td>
<td>Kootenay River</td>
<td>53</td>
</tr>
<tr>
<td>Lower Bonnington</td>
<td>1893, rebuilt 1934</td>
<td>FortisBC</td>
<td>Concrete gravity dam run of river</td>
<td>Kootenay River</td>
<td>50</td>
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<td>Corra Linn</td>
<td>1933</td>
<td>FortisBC</td>
<td>Concrete gravity dam run of the river</td>
<td>Kootenay Lake</td>
<td>45</td>
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<tr>
<td>Whatshan</td>
<td>1971</td>
<td>BC Hydro</td>
<td>Concrete dam</td>
<td>Whatshan Lake (shore of Arrow reservior)</td>
<td>54</td>
</tr>
<tr>
<td>Waneta</td>
<td>1954</td>
<td>Teck Cominco</td>
<td>Concrete gravity dam</td>
<td>Pend d'Ortrie</td>
<td>459</td>
</tr>
</tbody>
</table>

### Additional Information
There is no fish passage infrastructure on Canadian dams because there are no anadromous fish in the mainstream Columbia River in Canada. Anadromous fish passage into Canada was blocked by the construction of Grand Coulee Dam in 1941. Both the CBT and the Northwest Power and Conservation Council (NWPPC) supported investigating anadromous fish passage where feasible (such as Chief Joseph and Grand Coulee) noting that there are a number of issues that need to be resolved in order to achieve this objective.

## American Hydropower Projects

<table>
<thead>
<tr>
<th>Name</th>
<th>Completed</th>
<th>Operator</th>
<th>Type</th>
<th>Location</th>
<th>Generating Capacity (MW)</th>
<th>Fish Passage Facilities</th>
<th>Additional Information</th>
</tr>
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<tbody>
<tr>
<td>Bonneville</td>
<td>1938</td>
<td>U.S. Army Corps of Engineers (USACE)</td>
<td>Run of river dam and reservoir</td>
<td>Lower Columbia River - Oregon/Washington border</td>
<td>1087</td>
<td>Screens on all turbine units with a bypass system to tailwater • fish ladders with fish counting stations at both powerhouses</td>
<td>A juvenile bypass was completed in 1999 for powerhouse II</td>
</tr>
<tr>
<td>The Dalles</td>
<td>1957</td>
<td>USACE</td>
<td>Run of river dam and reservoir</td>
<td>Lower Columbia River - Oregon/Washington border</td>
<td>1807</td>
<td>Ice and trash sluiceway • two fish ladders with fish counting stations</td>
<td>Surface bypass system studies are ongoing at this project; however, spill and the ice and trash sluiceway will continue to be the primary juvenile passage routes</td>
</tr>
<tr>
<td>John Day</td>
<td>1968/1972</td>
<td>USACE</td>
<td>Run of river dam and reservoir</td>
<td>Lower Columbia River</td>
<td>2160</td>
<td>Screens on all turbines with bypass system to tailwater • two fish ladders with fish counting stations</td>
<td>Between 1985 and 1989, the Corps installed screens in all powerhouse units.</td>
</tr>
</tbody>
</table>

### Additional Information
- Screens on all units • bypass system to tailwater • Fish collection and monitoring
- McNeill's juvenile fish bypass system was
<table>
<thead>
<tr>
<th>Dam Name</th>
<th>Year(s)</th>
<th>Owner/Developer</th>
<th>River/Location</th>
<th>Features</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wanapum</td>
<td>1963</td>
<td>Grant County PUD</td>
<td>Mid Columbia River</td>
<td>Spillway deflectors and top spill bulkhead installed - two fish ladders</td>
<td>Grant County PUD's relicensing studies identified new surface flow bypass systems - turbine passage improvements - and habitat and hatchery programs to offset unavoidable losses</td>
</tr>
<tr>
<td>Rock Island</td>
<td>1933</td>
<td>Chelan County PUD</td>
<td>Mid Columbia River</td>
<td>Gatewell bypass system with no screen at powerhouse II - Chelan County PUD is evaluating a notched spillgate for providing downstream passage at the spillway - three fish ladders with counting stations</td>
<td>Rock Island was the first dam built on the mainstream Columbia River - spill is an integral part of the long-term plan for safely providing fish passage at the project</td>
</tr>
<tr>
<td>Rocky Reach</td>
<td>1961</td>
<td>Chelan County PUD</td>
<td>Mid Columbia River</td>
<td>Currently a bypass system with screens on two units and a surface collection system in the forebay cul-de-sac pass fish to a monitoring facility and the tailrace - spill also provided if needed - fish ladder with fish counting station</td>
<td>The unique hydrocombine design of Wells Dam enables the spillway to function as an extremely efficient fish bypass system</td>
</tr>
<tr>
<td>Wells</td>
<td>1967</td>
<td>Douglas County PUD</td>
<td>Mid Columbia River</td>
<td>Unique spillway design (modified in 1991) which lies over the turbine intakes to provide a bypass route for juvenile migrants - two fish ladders (one with trapping facility) - adult PIT-tag detectors were evaluated in 2002, determined to be 100 percent efficient, and were installed</td>
<td>Chief Joseph and Grand Coulee dams lack any fish passage facilities and thus permanently block anadromous fish from the upper Columbia River Basin</td>
</tr>
<tr>
<td>Chief Joseph</td>
<td>1955/1958</td>
<td>USA CoE</td>
<td>Upper Columbia River - Central Washington</td>
<td>Ice Harbor Intake screen bypass system was completed in 1993 - spill is also provided - two fish ladders with fish counting stations</td>
<td>Chief Joseph Dam</td>
</tr>
<tr>
<td>Grand Coulee</td>
<td>1941 (4) 1982 (6)</td>
<td>U.S. Bureau of Reclamation</td>
<td>Grand Coulee, WA Columbia River mile 596.6</td>
<td>Intake screen bypass system completed in 1992 - collection and transport facilities - spill is also provided during the spring - two fish ladders</td>
<td>See Chief Joseph Dam</td>
</tr>
<tr>
<td>Albeni Falls</td>
<td>1955</td>
<td>USA CoE</td>
<td>Pend d'Oreille River</td>
<td>Ice Harbor Intake screen bypass system was completed in 1993 - spill is also provided - two fish ladders with fish counting stations</td>
<td>Libby Dam is a major upriver storage dam for the Columbia River hydropower system</td>
</tr>
<tr>
<td>Libby</td>
<td>1973</td>
<td>USA CoE</td>
<td>Columbia River mile 221.0</td>
<td>Lower Monumental Intake screen bypass system completed in 1992 - collection and transport facilities - spill is also provided during the spring - two fish ladders</td>
<td>Hungry Horse Dam is the most upstream major storage project in the United States for the Columbia River hydroelectric system</td>
</tr>
<tr>
<td>Hungry Horse</td>
<td>1953</td>
<td>U.S. Bureau of Reclamation</td>
<td>South Fork, Flathead River above Flathead Lake</td>
<td>Lower Monumental Intake screen bypass system completed in 1992 - collection and transport facilities - spill is also provided during the spring - two fish ladders</td>
<td>Dwraksh Dam permanently blocks salmon and steelhead from the North Fork Clearwater River</td>
</tr>
<tr>
<td>Ice Harbor</td>
<td>1962 (3) 1976 (3)</td>
<td>USA CoE</td>
<td>Lower portion of Snake River mile 9.7 Pasco, Washington</td>
<td>Lower Monumental Intake screen bypass system completed in 1992 - collection and transport facilities - spill is also provided during the spring - two fish ladders</td>
<td>The Hells Canyon complex (Hells Canyon, Oxbow, and Brownlee projects) permanently blocks salmon from the upper Snake River Basin</td>
</tr>
<tr>
<td>Lower Monumental</td>
<td>1970 (1) 1978 (1)</td>
<td>USA CoE</td>
<td>Lower portion of Snake River mile 41.6 Kahlotus, Washington</td>
<td>Lower Monumental Intake screen bypass system completed in 1992 - collection and transport facilities - spill is also provided during the spring - two fish ladders</td>
<td>The Hells Canyon complex (Hells Canyon, Oxbow, and Brownlee projects) permanently blocks salmon from the upper Snake River Basin</td>
</tr>
<tr>
<td>Little Goose</td>
<td>1970 (1) 1978 (1)</td>
<td>USA CoE</td>
<td>Lower portion of Snake River mile 70.3 Starbuck, Washington</td>
<td>Lower Monumental Intake screen bypass system completed in 1992 - collection and transport facilities - spill is also provided during the spring - two fish ladders</td>
<td>The Hells Canyon complex (Hells Canyon, Oxbow, and Brownlee projects) permanently blocks salmon from the upper Snake River Basin</td>
</tr>
<tr>
<td>Lower Granite</td>
<td>1975 (3) 1978 (3)</td>
<td>USA CoE</td>
<td>Lower portion of Snake River mile 103.5 Almota, Washington</td>
<td>Lower Monumental Intake screen bypass system completed in 1992 - collection and transport facilities - spill is also provided during the spring - two fish ladders</td>
<td>The Hells Canyon complex (Hells Canyon, Oxbow, and Brownlee projects) permanently blocks salmon from the upper Snake River Basin</td>
</tr>
<tr>
<td>Dworshak</td>
<td>1973</td>
<td>USA CoE</td>
<td>North Fork Clearwater River mile 1.9 Ahtsahka, Idaho</td>
<td>Lower Monumental Intake screen bypass system completed in 1992 - collection and transport facilities - spill is also provided during the spring - two fish ladders</td>
<td>The Hells Canyon complex (Hells Canyon, Oxbow, and Brownlee projects) permanently blocks salmon from the upper Snake River Basin</td>
</tr>
<tr>
<td>Boundary</td>
<td>1965/1985</td>
<td>City of Seattle</td>
<td>Pend d'Oreille River mile 17 - Metalline Falls, Washington</td>
<td>Lower Monumental Intake screen bypass system completed in 1992 - collection and transport facilities - spill is also provided during the spring - two fish ladders</td>
<td>The Hells Canyon complex (Hells Canyon, Oxbow, and Brownlee projects) permanently blocks salmon from the upper Snake River Basin</td>
</tr>
<tr>
<td>Hell's Canyon</td>
<td>1967</td>
<td>Idaho Power Company</td>
<td>Snake River mile 247 + Oxbow, Oregon</td>
<td>Lower Monumental Intake screen bypass system completed in 1992 - collection and transport facilities - spill is also provided during the spring - two fish ladders</td>
<td>The Hells Canyon complex (Hells Canyon, Oxbow, and Brownlee projects) permanently blocks salmon from the upper Snake River Basin</td>
</tr>
<tr>
<td>Oxbow</td>
<td>1961 (4) 1978 (1)</td>
<td>Idaho Power Company</td>
<td>Snake River mile 273 between Oregon &amp; Idaho + Oxbow, Oregon</td>
<td>Lower Monumental Intake screen bypass system completed in 1992 - collection and transport facilities - spill is also provided during the spring - two fish ladders</td>
<td>The Hells Canyon complex (Hells Canyon, Oxbow, and Brownlee projects) permanently blocks salmon from the upper Snake River Basin</td>
</tr>
<tr>
<td>Brownlee</td>
<td>1959 (4) 1983 (6)</td>
<td>Idaho Power Company</td>
<td>Snake River mile 285 between Oregon &amp; Idaho + Cambridge, Idaho</td>
<td>Lower Monumental Intake screen bypass system completed in 1992 - collection and transport facilities - spill is also provided during the spring - two fish ladders</td>
<td>The Hells Canyon complex (Hells Canyon, Oxbow, and Brownlee projects) permanently blocks salmon from the upper Snake River Basin</td>
</tr>
</tbody>
</table>
COLUMBIA BASIN TRUST

Water issues are at the core of the Columbia Basin Trust's (CBT) existence. The Columbia Basin Trust was created in recognition of the impacts associated with the management of water in this region.

In the early 1990s, people of the Columbia Basin became aware that new opportunity for public involvement in the Columbia River Treaty (CRT) might present itself. The sale of the first 30 years of IC's share of the downstream benefits, through the CRT, was about to expire. Leaders from First Nations, local communities, and the Province of BC worked together on an agreement that recognized the impacts the CRT dams had on this area. This agreement led to the creation of the Columbia Basin Trust.

In 1995, the CBT was formed with a unique mandate to support the forces of the people of the Basin to create a legacy of social, economic, and environmental well-being and to achieve greater self-sufficiency for present and future generations in the region most affected by the CRT.

The Columbia Basin Trust was endowed with $295 million from the Province of BC (approximately five percent of the downstream benefits owned by the Province of BC).

During the creation of the Columbia Basin Trust, there was extensive public consultation with Basin residents that resulted in the creation of the Columbia Basin Management Plan. This plan guided the creation of programs to support the social, economic, and environmental well-being for the residents of the Canadian Columbia Basin, and guided CBT's activities as we developed power projects.

The Columbia Basin Trust, along with our power partner, Columbia Power Corporation, jointly made investments into upgrading existing hydroelectric facilities on the Columbia River system, as well as building new generating stations on existing dams.

FOR MORE INFORMATION CONTACT US AT:
Suite 300, 445 – 13th Avenue • Castlegar, BC V1N 1G1
toll-free: 1-800-505-8998 • local: 250-365-6633 • e-mail: cbt@cbt.org
website: www.cbt.org

WORKING ON WATER ISSUES

Basin residents have identified a broad range of concerns regarding water quality and quantity, from both human use and natural ecosystem perspectives. Currently there is not a comprehensive vision or strategic plan that incorporates a wide range of values regarding water issues in the Basin. CBT wants to involve Basin residents in building a network of organizations to address water issues in the Basin. In order to carry out this mandate, CBT has allocated staff and financial resources to its Water Initiatives Program, and is currently involved in a number of water education and public awareness initiatives across the Columbia Basin.

Public consultation with Basin residents in the creation of the CBT identified that one of the priorities of the organization should be to prepare the residents of the Columbia Basin for the potential renewal, or renegotiation of the CRT. This process can start as early as 2014. The CBT is committed to ensuring that the values and views of Basin residents are a key part of the process from start to finish.

As part of this commitment, the CBT is working in partnership with a variety of community groups, local governments, First Nations, provincial organizations, and federal organizations to increase the understanding of water issues in the Columbia Basin and cooperatively work towards a common agreement for the future management of our shared water resources.

COLUMBIA BASIN TRUST

a legacy for the people

Columbia Basin Trust would like to recognize BC Hydro, NWPC, Fortis BC, and Nelson Hydro for providing photos and Information for this project.
As background it should be noted that present numbers of virtually all species in the Duncan-Lardeau area are significantly lower than they were before the loss of the Duncan Flats behind the Duncan Dam in 1968. This is most especially true for aquatic mammals and waterfowl. A 1968 field study report by the BC Fish and Game Branch predicted that the Duncan reservoir would have the following effects on wildlife:

Waterfowl and aquatic fur-bearing habitat will be completely removed from the Duncan drainage (by the reservoir). Migration habitat will be removed for about 50,000 ducks, 5,000 geese, 1,000 swans, nesting habitat for 1,000 pairs of ducks, and an unknown number of geese... roughly 1,000 beavers and 2,000 muskrats... 400 white-tailed deer... will be displaced. Mink, muskrat, black bear, grizzly bear and fur bearers will be affected through... loss of range, flooding, drowning, and the barrier effect of the reservoir.
Biodiversity Lost to Flooding
Low elevation forest, grassland ecosystems,
Complex aquatic/floodplain ecosystems,
Riparian zones and sophisticated fish & wildlife habitats

"Behind the Duncan Dam" - The Duncan Reservoir is 45 kms long at full pool and has a footprint of 7298.5 ha. Pre-dam historical photos show extensive wetlands: 6400 acres (2590 ha), some 400 acres (1619 ha) of wetland meadows and 450 acres (182 ha) of open sloughs - lost to flooding.
Every year in March - April

Duncan Reservoir

Moon-like ecosystems after 50 years of “clean - green hydroelectricity”

Fish & Wildlife habitat after 50 years of “clean - green hydroelectricity”
Duncan Dam: After 50 years, it is time to use the generating capacity of this storage dam’s massive water overflow for the power generation in British Columbia.

Hydroelectric Power from the Duncan Dam would contribute to achieving self sufficiency for present and future demands.
Background Information from Friends of the Lardeau River

As you may know, the cumulative effects of resource extraction, highways, urban and rural settlements, hydropower, water storage projects and all other human development and land use activities has created serious stress and fragmentation within many Kootenay and Columbia ecosystems. The impacts from the footprints of the numerous dams and reservoirs within the Columbia basin has caused significant fish and wildlife losses, diminished natural abundance, dwindling biological diversity and massive habitat degradation.

With ease..... the stroke of a pen... a couple of times, the Provincial, Federal and U.S. Governments simply flooded hundreds of miles and thousands upon thousands of hectares of this regions most complex diversity of ecosystems. The Corra Lynn, South Slocan, Upper Bonnington, Lower Bonnington, Brilliant, Kootenay Canal, Hugh Keeneyside, Seven Mile, Mica, Revelstoke, Spillimacheen, Aberfeldie, Elko, Walter Hardman, Whatshan, Waneeta and of course the Libby and the Duncan Dams – have wiped out some of this province’s more impressive lakes, rivers, forests, wildlife and fisheries within the Columbia, Kootenay, Arrow and Duncan drainage basins.

The Federal, Provincial and Regional approach to compensation for losses of primary productive capacity has been applied poorly and implemented very slowly. The various levels of Government should establish the habitat policy of ‘no net loss’ and ‘like for like compensation’ by replacing natural habitat at or near the site of loss, followed by off-site habitat replacement and productivity improvements of existing habitats. This is an innovative principle and target that needs to be implemented seriously.

The Duncan Dam was constructed in 1967 without a second thought for forestry values, fish and wildlife habitats, Hydro electricity, or fish escapement capacity. Approximately 7500 hectares of prime fish and wildlife habitats were squandered by 28 miles of reservoir and these crucial wetlands, migration corridors, rivers and lakeshores, riparian zones, feeding areas, summer and winter range, calving, birthing, nesting, den, mating and spawning sites are extinguished indefinitely. The Duncan Reach lost 93% of its historic wetland/floodplain habitats.

As of this date in 2017, there is no fish passage infrastructure or generating capacity at the Duncan Dam facilities. We must continue to recognize the never-ending impacts associated with the numerous dams and the over management of water resources within the Columbia Basin region. The people and especially the fish and wildlife of the Columbia Basin, have contributed beyond reason to support approximately 52% of BC’s supply of Hydro electricity.
January 31, 1995

Grant Trower
PO Box 1088
Kaslo BC V0G 1M0

Dear Grant Trower:

Re: Lardeau River Values

Further to our telephone call of January 27, 1995, I would like to reaffirm with you my views of the value of the Lardeau River. As you know, the Lardeau is the only major river tributary to Kootenay Lake which has not been adversely affected by hydro development. The Kootenay (Libby Dam) and Duncan rivers have been negatively impacted thus placing even greater importance on the Lardeau.

Given the uniqueness of the Gerrard rainbow trout, every consideration should be given to protection of Lardeau and its tributaries.

Sincerely,

H. Andrusak
Director

HA:ceh

cc: D. McDonald
    J. Hammond
    D. Hamilton
Along the LARDEAU RIVER corridor

The Lardeau River is the only remaining major wild & free flowing watershed system in the West Kootenay / Columbia Basin....that has not been flooded by the numerous hydroelectric and water storage dams.
The Lardeau River is the only remaining major free flowing River system entering Kootenay Lake. The River supports a wealth of fish and wildlife diversity along its entire length from its origins at Trout Lake to its confluence with the Duncan River near Meadow Creek BC. From there it is only a short migration to the north end of Kootenay Lake. The Lardeau River is home to many resident and migratory fish populations that are integral to the Kootenay Lake ecosystem. Many important inflows feed the River from numerous tributary streams located along its entire length. Much of the complexity and diversity of wildlife supported by this waterway is due to its low gradient, near pristine nature and the mature forests along its banks. However, the river has sustained major impacts from many natural and man-made influences, (logging roads, erosion, forestry, mining, human settlements, forest fires, washouts, overfishing, highways and dams) they constantly threaten this unique system.

The Lardeau River supports the largest natural spawning population of Kokanee Salmon (Oncorhynchus nerka) in the entire Columbia Basin. Much of the Lardeau's diversity and health can be attributed to the abundance of Kokanee that spawn there every fall. After the eggs are deposited, development occurs through the winter until the fry emerge in the spring. Young fry migrate to Kootenay Lake to mature. Juvenile Kokanee spend approximately three years in Kootenay Lake before returning to the Lardeau as adults to spawn. Kokanee are considered a keystone species in the Kootenay Lake ecosystem because they are an important prey source for a number of predator fish. Gerrard Rainbow Trout and Bull Trout thrive there because of the Kokanee bounty. In the fall the amazing shoreline highways of red Kokanee spawners in the Lardeau are actively sought by air and land-based predators such as eagles, grizzly bears and black bears. Kokanee carcasses also provide the River with important nutrients essential for growth of algae, aquatic insects and juvenile fish at the formative stage of the food web.

The Lardeau River provides critical spawning and rearing habitat for the unique Gerrard Rainbow Trout (Oncorhynchus mykiss), a genetically and morphologically distinct species. Much of their natural production is dependent on the diversity and complexity of habitat throughout this fairly pristine River. Gerrard Rainbow Trout spawn annually in the
spring with the vast majority found spawning at the historical townsite of Gerrard at the outlet of Trout Lake. Fry emergence in late June and disperse downstream taking refuge in habitat along the length of the River. Juveniles can rear in the River for 1-3 years before entering Kootenay Lake. Adult fish at ages between 5-8 years old return every spring to spawn. Once Gerrard's enter Kootenay Lake they rely almost exclusively on Kokanee for their food, Kokanee availability are the reason Gerrards can reach such a large size, often more then 9 kg.

The Lardeau River Valley also provides essential habitat for Kootenay Lake Bull Trout (Salvelinus confluentus), they spawn and rear in many of the tributary streams of this important River. Juvenile Bull Trout share the River system with juvenile Gerrard's, the young rainbows rear in the river itself while young Bull Trout rear in the tributary streams. Bull Trout are a listed "Species of Concern" provincially and are considered an indicator species of the health of a watershed. Bull Trout tributary spawn in the fall, their Fry emerge in the spring and disperse downstream taking refuge within the available habitat in the tributaries. Juveniles can rear in their home streams for 1-4 years before passing through the Lardeau on their way to Kootenay Lake. Adult fish at ages ranging from 5-12 years old return in the fall to spawn. Similar to Gerrard Rainbow Trout, Bull Trout rely heavily on Kokanee for food during their adult life stage, frequently attaining sizes greater then 7 kg.

As with many cold water fish populations, Kokanee, Rainbow Trout and Bull Trout are highly sensitive to habitat alteration, degradation and fragmentation. Kootenay Lake and many of its fish populations have already undergone major impacts as a result of human activities. The Lardeau River is integral in supporting and sustaining a wealth of aquatic and terrestrial diversity within the Kootenay Lake ecosystem and warrants the need for conservation and protection.

**Friends of the LARDEAU RIVER**
Support Gerrard Rainbow Trout
Contact us at Box 1088 Kaslo V0G 1M0

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Kootenay Lake Crisis

In the wake of Kootenay Lakes' kokanee, trout and char population collapse, the Federation has been pressing the Ministry of Forest Lands and Natural Resource Operations (FLNRO) for action. BCWF has asked the Ministry to collaborate on a workshop to bring professional and public focus on how to address the crisis.

BCWF has requested a commitment from the FLNRO to the following courses of action:

• A conservation plan for the kokanee, Gerrard rainbow trout and bull trout populations in Kootenay Lake,
• A conservation plan for the Gerrard rainbow trout population that includes holding the required number of fish in captive brood stock to maintain the genetic diversity of this unique population in the face of a collapse to the spawning population, and
• An independent and transparent peer review of the above plans, and
• Management prescriptions that will be brought into force to ensure this unfortunate event does not occur again in the future.

Historically low kokanee spawner numbers were counted at the Meadow Creek spawning channel in September 2015. On average over the last five decades, this channel has produced about 500,000 spawners, but in the last three years numbers have dwindled to 200,000 in 2013, 78,000 in 2014 and less than 10,000 in 2015. The prediction for 2016 is about the same as 2015.

As a consequence of today's low kokanee numbers, their predators are in serious decline, with the world renowned Gerrard rainbow trout also at historically low numbers. Stock recovery will take over a decade or more. Other species such as, white sturgeon and burbot that are listed as endangered, also rely on kokanee.

Commendations to all the BCWF members who submitted their beautiful wildlife photographs and made the BCWF Commemorative 60th Anniversary Calendar possible! We hope you enjoy your copy of the calendar enclosed with this magazine as a special thank-you from BCWF. To purchase extra copies of the 2016 calendar for the outdoor enthusiasts in your life, please visit our On-line Store, which can be found under the Shop Online menu of our website at bcwf.bc.ca
This year, the BC Wildlife Federation continues to focus on issues affecting the sustainability of fish and wildlife and their habitats. These resources are held in trust for the public and we need to ensure governments do not privatize or damage these precious assets. We need to confirm there is adequate science behind any changes to fish and wildlife management in the province.

An example of using sound scientific management to prevent the extinction of a species can be seen in the province’s plan to protect mountain caribou. Most of the world’s remaining caribou live in B.C. and there are only about 1,500 of this deer species left. The BCWF participates in the Mountain Caribou Recovery Implementation Program Progress Board, which is a multi-sector group set up to monitor the effectiveness of caribou recovery objectives. The BCWF supports a small, humane wolf cull to bring up the population of the South Selkirk herd since there are only 14 left.

No-one is happy to have to kill wolves to protect the mountain caribou. The problem was created by humans because development has increased wolves’ access to the herds. Snowmobiling, cat skiing, and increased road and trail densities have allowed wolves to access high elevation winter range. In an intact ecosystem, wolves do not have as much access to caribou. In the short-term, science tells us wolf management is required to save the species. In the long-term, critical mountain caribou habitat must be protected.

The BCWF is concerned about the cumulative impact of resource development on fish, wildlife, and habitat in B.C. with regards to major oil and gas projects, major pipeline proposals, and hydroelectric development. The National Energy Board (NEB) granted the Federation Intervenor status on the Trans Mountain Pipeline Expansion Project. Final oral hearings will be scheduled and the BCWF will be there requesting any project approval include the requirement for data collection to measure the cumulative impact of pipeline development on fragile urban watercourses and wetlands.

Coordination between provincial and federal decisions makers will be required for effective and efficient treatment of cumulative effects, and the development and approval of resource development projects. Clarity on the coordination between the provincial and federal levels is essential in the case of species and habitats such as fish and fisheries that fall under the federal jurisdiction for addressing cumulative effects in a manner that provides the level of certainty essential to proponents for project development.

The need for a cumulative effects assessment framework to address issues across jurisdictional boundaries is urgent.

BCWF participates in the North East Cumulative Effects Management (CEM) Pilot Project, which is designed to serve as a model for the rest of the province. BCWF wants all future development to adhere to a CEM framework before being approved to proceed.

In collaboration with the Fraser Basin Council, BCWF has been advocating for the creation of a Natural Resources Practices Board (NRPB) to expand the existing Forest Practices Board to oversee other types of resource extraction in B.C. The Federation believes that an independent Board could provide oversight and ensure compliance with the existing acts and regulations from all sectors that govern resource development, not just the Forest and Range Practices Act. The NRPB would have the ability to: examine whether the current laws, policies, and regulations are effective in protecting resource values, and conduct investigations in key resource sectors and geographical areas on management performance. A good interim step would be to give the Board mandate to examine authorizations under Acts and Regulations administered by the Ministry of Forest Lands and Natural Resource Operations.

In recent years, all levels of government have relied heavily on the "professional reliance model", which itself relies on companies and industry largely monitoring themselves. Establishing a Natural Resources Practices Board would provide independent advice to government and ensure that this model is performing and meeting its public trust.

The BCWF continues to advocate for sustainable funding to protect public resources. We need on-going funding to implement the Recreational Fisheries Vision in regards to catch monitoring, enhancement and stock assessment. For example, Kokanee fisheries have collapsed on Kootenay Lake because of unfavourable biological conditions and predation. The Gerard Rainbow Trout is unique to Kootenay Lake and its genetic diversity needs to be protected through action.

We continue to engage with the provincial government through angling and hunting advisory processes to make sure new regulations don’t raise barriers for participation by residents. Advisory groups are meeting in November and BCWF volunteers will bring any issues that come up to the membership.

Another important level of government we are working with...
CONSERVATION GROUPS UNITE FOR WILDLIFE

TOWN HALLS

The BCWF has been holding a series of Town Hall in British Columbia.

Jesse Zeman, Resident Priority Program Manager reports "The long-term lack of funding and slow decline of our fish and wildlife resources has been eye opening to those attending the Town Halls. People are extremely concerned about what is being left to future generations."

Zeman said multiple MLA candidates attended and learned about the chronic under-funding of the fish and wildlife branch in BC.

The BCWF has also asked all candidates five questions related to sustainability and public access to public resources. The NDP has provided their response and is available on the BCWF website.

To view the 5 questions sent to Political Parties, click here.

WATCH: The BC Wildlife Federation says we are losing what makes BC special.
Read the article from the Oliver Chronicle here.

Don't miss the Town Hall in your community!
To view the Town Hall schedules, click here.

Report environmental abuse with a few clicks of your iPhone. It's easy with the new BCWF Conservation App.

**CALENDAR OF EVENTS**

| April 19 | Nelson Town Hall, Nelson District Rod & Gun Club, 7 pm |
| April 20 | Cranbrook Town Hall, Prestige Rocky Mountain Resort, 7 pm |
| April 21 | Invermere Town Hall, Invermere Community Hall, 7 pm |
| April 24 | Victoria Town Hall, Strawberry Vale & District Community Hall, 7 pm |
| April 25 | Nanaimo Town Hall, Nanaimo Fish & Game Club, 7 pm |
| April 26 | Fort St. John Town Hall, Fort St. John Curling Club, 7 pm |
| April 26 | Lower Mainland Town Hall, Langley Civic Centre, 7 pm |
| April 28-30 | Cloverdale Hunting & Fishing Show, Surrey |
| April 29 | Fernie & Dist Rod & Gun Club Awards Night & Fundraiser |
| May 1 | Vernon Fishing Forever, Mabel Lake, 10 am |
| May 4-6 | BCWF 2017 AGM & Convention, Nelson |
| May 4-7 | Portuguese Rod & Gun Club Annual Boston Bar Picnic |
| May 6 | Wildlife Records Club of BC 16th Annual Banquet and Fundraiser |
Don't miss the Town Hall in your community!
To view the Town Hall schedules, click here.

SUCCESSFUL TOWN HALLS

Fish and wildlife populations are declining and we want your help to do something about it.
The BC Wildlife Federation is hosting a series of Town Hall meetings across B.C.
Tonight we are in Nelson, BC.
MEMBER UPDATE APR. 12, 2017

Are we losing what makes BC special?
BC’s fish, wildlife & habitat need your support!

What you can do:
- Make your voice heard by signing our petition to increase funding for fish and wildlife management and call for a Town Hall debate.
- Ask your local MLA what they will do to ensure the future of BC’s fish, wildlife and habitat.

TAKE ACTION - SIGN OUR PETITION

Help us send the message that British Columbians care about fish and wildlife!

Fish and wildlife populations are declining throughout the province, but we can turn that trend around.

The BCWF is pleased that the province recently made an announcement committing all hunting licence revenues to a stand-alone agency to enhance wildlife management. However, the provincial election is just around the corner – and it is critically important that the government formed in May follows through on this commitment.

That’s why we’re asking you to please sign the BCWF petition calling on the BC government to increase funding and to set objectives for BC’s fish, wildlife and habitat!

The petition will be delivered to every MLA elected on May 9th and will be read out in the Legislative Assembly of BC when the new government is in session. We want to make sure that we have signatures from every constituency in the province, so please help spread the word - and let’s send a strong message to the new government that British Columbians care about the future of our fish, wildlife and habitat.

MEMBER UPDATE APR. 19, 2017

TAKE ACTION - SIGN OUR PETITION

The BC Wildlife Federation has launched an online petition calling on the BC government to increase funding and to set objectives for our fish, wildlife and habitat.

BC is one of the most biodiverse jurisdictions in North America and at the same time one of the most under-funded.

The intent of the petition is to convey the importance British Columbians place on fish, wildlife and habitat.

Sign the petition HERE
The U.S. government has recommended the removal of four hydroelectric dams on the Klamath River in Oregon and California to aid native salmon runs and help resolve a decades-long struggle over allocation of scarce water resources.

The proposal, which comes as the largest dam removal project in U.S. history is nearing completion in Washington state, concerns a system of dams that straddle the Oregon-California border.

The proposal to dismantle the dams owned by utility PacifiCorp coincides with a broader push by environmentalists and others to restore salmon fisheries in the Klamath Basin and elsewhere in the nation.

The dams recommended for removal, two in Oregon and two in California, block upstream spawning migrations of salmon and place juvenile fish at risk by slowing their return to the Pacific Ocean.

Removing them would open 675 kilometres of salmon habitat for the first time in 100 years, eliminate turbines that grind up fish and restore the Klamath River channel, according to the government analysis.

The recommendation stems from a 2010 agreement among competing Klamath Basin water users that called for the government to determine if removing the dams would restore failing salmon runs and lessen conflicts in regional water management.

The Klamath River contains several fish species on the federal threatened and endangered species list, including Coho salmon, and repeated droughts in the basin have periodically forced U.S. water managers to allocate flows to protected fish rather than to farmers for irrigation.

The recommendation, which came in an environmental impact statement released by the interior department, follows years of legal wrangling and periods of low flows that saw massive die-offs of salmon, closures of irrigation districts and tightening of rules for hydroelectric projects that caused them to operate at losses.

The near collapse of Klamath Basin Chinook salmon led the U.S. government in 2006 to severely restrict commercial and sport fishing in the Klamath River and along 1,100 km of the California and Oregon coast.

In a statement, interior secretary Ken Salazar described the dismantling of the dams as "a comprehensive solution addressing all of the needs of the Klamath Basin, including fisheries, agriculture, refuges and power."

Under the proposal, which must still gain congressional approval, the dams would be removed over 20 months at a cost of $450 million to be garnered from ratepayers and bonds. If the dams were to remain in place, PacifiCorp would incur more than $460 million in costs for relicensing, operation and maintenance of aging structures that have proved unprofitable, the analysis shows.

Glen Spain, regional director of the Pacific Coast Federation of Fishermen’s Associations, said the analysis "confirms that dam removal is both feasible and cheaper than any other option." However, Klamath County commissioners have withdrawn their support for taking down the dams.

The project is expected to be completed this summer with the dismantling of the second of two towering dams on the Elwha River in Olympic National Park in Washington.

The project is designed to allow salmon to return to their historic spawning areas and raise salmon counts from 3,000 to 400,000.
Ocean-going fish make quick return to river

Removal of century-old dams has allowed steelhead to re-establish old spawning grounds

BY PHUONG LE

WASHINGTON STATE

SEATTLE — Scientists knew ocean-going fish would eventually return to the Elwha River on Washington State’s Olympic Peninsula, once two massive concrete dams were torn down. They just didn’t think it would happen so soon.

Biologists tracking fish in a tributary of the Elwha last month spotted wild steelhead that likely made it on their own past the site where the Elwha Dam stood for nearly a century — before it was dismantled in March as part of the largest dam removal project in the U.S.

“We’re wildly excited,” said Mike McHenry, fish habitat manager for the Lower Elwha Klallam Tribe. “It just confirms what we have known all along — that these fish are quite capable of recolonizing the Elwha once we get the dams out of the way.”

The tribe is a partner with the U.S. National Park Service in an ambitious $325-million federal project to restore the Elwha River, about 80 miles west of Seattle, and its legendary fish runs.

The 30-metre-tall Elwha Dam came down in the spring, and construction crews this month are blasting away pieces of the 65-metre Glines Canyon Dam about 12 km upstream. By summer 2013, the glacier-fed Elwha River is expected to flow freely as it courses from the Olympic Mountains to the Strait of Juan de Fuca.

After the two dams were built, five species of Pacific salmon and other seagoing fish such as steelhead were confined to the lower eight km of this river. Once the two dams are removed, salmon and other fish that mature in the ocean and return to rivers to spawn will once again have access to more than 110 km of spawning and rearing habitat, much of it within the protected boundaries of Olympic National Park.

Scientists knew fish would recolonize the river, a process that is likely to take decades, but “it’s always nice to confirm,” McHenry said.

“The message is game on. They’re active. They’re in the watershed. They have access now,” McHenry added. “Next year will be pretty exciting. They’ll have the opportunity to ascend up. And all of a sudden they’ll be in a big national park. Where are they going to go and what are they going to do?”

In recent months, biologists with the tribe and the National Oceanic and Atmospheric Administration have been walking the banks of the Little River — a tributary of the Elwha between the two dams — to track winter-run steelhead returning to spawn.

This spring, the biologists tagged about 40 mostly female adult winter steelhead and moved them from below the dam sites to the cooler, clearer waters of the Little River. But walking along the riverbank one rainy June morning, the biologists spotted several male steelhead that had no tags and which they hadn’t moved. One male in particular was almost a metre long, much bigger than any of the male fish they had tagged; it also lacked the fungus blotches that characterized the ones they had moved, said John McMillan, a fish biologist with NOAA’s Northwest Fisheries Service Center, who was with Ray Moses, project biologist with the Lower Elwha Klallam Tribe.

“We both looked at each other, and thought, ‘Wow. This is cool,’” McMillan said. “Based on the size and lack of tag... we can only surmise that it made it up there on its own.”

McMillan said it’s likely the male steelhead were drawn to the clearer waters or sought out their female mates, who excrete fluid attractant when they spawn. Another indication that fish are making their way past the former dam site: The biologists spotted a spawning redd in Indian Creek, another Elwha tributary, where they did not relocate any fish.

Historically, steelhead travelled extensively along the 75-km Elwha River and its many tributaries. Before the dams were built in the early 1900s, an estimated 392,000 fish returned to the Elwha each year. Those numbers have declined to about 3,000, with an estimated 200 to 500 wild steelhead.

The Elwha River is closed to all fishery activity for almost a hundred years, during a five-year moratorium to help the river following the removal of the two dams.

“It’s a lot of fun to see a fish make it past an area that has blocked migration for almost a hundred years,” McMillan said. “That’s the ultimate goal of the whole project. That it happened rapidly and that it was a steelhead was apropos.”

Associated Press
Background Information

As you may know, the cumulative effects of resource extraction, transportation corridors, agriculture, urban/rural settlements, recreation, hydropower/water storage projects and all other human development and land use activities has created serious stress and fragmentation within many Kootenay and Columbia ecosystems. The impacts from the footprints of the numerous dams and reservoirs within the Columbia Basin has caused significant fish and wildlife losses, diminished natural abundance, dwindling biological diversity and massive habitat degradation.

With ease.... the stroke of a pen.... a couple of times, the Provincial, Federal and U.S. governments simply flooded hundreds of miles and thousands upon thousands of hectares of this regions most complex diversity of ecosystems. The Corra Lynn, South Slocan, Upper Bonnington, Lower Bonnington, Brilliant, Kootenay Canal, Hugh Keeneyside, Seven Mile, Mica, Revelstoke, Spillimacheen, Aberfeldie, Elko, Walter Hardman, Whatshan, Waneeta and of course the Duncan and Libby Dams - have wiped out some of this provinces most impressive lakes, rivers, forests, wildlife habitats and fisheries within the Columbia, Kootenay, Arrow and Duncan drainage basins.

1. Pursuant to its Conditional Water Licence, BC Hydro has a duty to compensate for loss of ecosystems, wildlife, and wildlife habitat resulting from BC hydro dams and reservoirs.
2. The Fish and Wildlife Compensation program was established in 1995 as the arm through which BC Hydro discharges that duty.

The FWCP, Columbia Basin was established to offset footprint impacts of BC Hydro dams and reservoirs on fish and wildlife in the Basin and the objectives of the FWCP are; 1) to meet BC Hydro water licence obligations with regard to compensation of fish and wildlife impacted by dam construction, 2) to sustain and enhance fish and wildlife populations by undertaking projects with potential to mitigate impacts resulting from BC Hydro projects. Potential compensation opportunities identified in a series of impact assessment reports are summarized and compensation options included for both aquatic and terrestrial ecosystems (mainly off-site). Habitat securement for off-site compensation options depend heavily on availability of low elevation habitats and consequently these areas have value both as benchmarks and potential concentration areas for fish and wildlife populations in remaining low elevation habitats. Long-term investments in these activities will contribute to meeting the water licence conditions that gave rise to the FWCP and provide valuable support to maintaining the biodiversity of the Columbia Basin.
The FWCP principles include actions to restore, enhance and conserve priority species and their habitats.

The Dam footprint Impact Summary was compiled for the FWCP in 2011. Terrestrial species impacts were analyzed by Manley and Krebs in 2010 (Impact Summary p. 26). Loss of habitat is the primary driver in species impacts. The western toad is a forest animal, it does not drink water, but absorbs it through the skin. To do so, it needs wet or very wet forest cover. The terrestrial ecosystem type most impacted on an area basis was wet forest, accounting for 42% of area lost. In the Arrow Reservoir, the western toad lost 26,000 ha (half of the area flooded) of available toad habitat. (Impact Summary, p.18) Therefore, Utzig and Schmidt classified the western toad as a Priority 1 species.

FWCP has not been able to establish even one protected western toad habitat anywhere in the Columbia Basin.

The Province has regulatory responsibilities for conservation and management of non-tidal fish, wildlife, ecological, and water resources as outlined within numerous strategic plans.

MINISTRY of ENVIRONMENT - Ecosystems Program Plan - June 2010 - Conserving British Columbia’s Species, Habitats and Ecosystems

Conservation priorities: The British Columbia Conservation Framework. The Conservation Framework represents a new and fundamentally different approach, a shift from reactive to proactive management of species and ecosystems, by providing a framework to:

1) act sooner, to apply preventive conservation approaches before species and ecosystems become at risk, and to lessen the need to rely on reactive conservation (e.g., recovery, restoration).

2) act smarter, ensuring that priority-setting is science-based, with proactive assignment required conservation actions.

3) act and invest in a more coordinated way, by aligning resources with the highest conservation priorities and implementing actions across government and with stakeholders and partners.

Building on the Conservation Framework and the work of the BC Conservation Data Centre, the Species at Risk Task Force will provide fiscally responsible and economical viable recommendations to the BC government for the conservation of species and ecosystems at risk in the Province. The Ecosystems Program will provide secretariat support to the task force, and will adjust priorities and business planning as needed to enable implementation of accepted recommendations.
The framework is based on the fundamental principle that we all share responsibility for keeping our native species and ecosystems healthy.

The Conservation Framework has the following three goals:

1. to contribute to global efforts for species and ecosystems conservation
2. to prevent species and ecosystems from becoming at risk
3. to maintain the full diversity of native species and ecosystems

Seven years since June 2010 and the MFLNRO and MOE should implement the Ministry of Environment's - Ecosystem and Wildlife Program Plans " a variety of legislation, regulations, policies, and best management practices that form the regulatory framework for managing wildlife and wildlife habitat in British Columbia

So far Gov’t is still relying on reactive conservation and not taking advantage of its own vision and goal of providing proactive and preventative conservation actions for the management of species and ecosystems.

BC Hydro and FLNRO have a number of roles and responsibilities that are particularly relevant to the development and implementation of actions through the Fish and Wildlife Compensation Programs action plans;

2) Riparian and Wetlands Action Plan - maintaining productive, functioning and diverse ecosystems.
3) Species of Interest Action Plan - compensating for losses requires either the creation of new habitat or the conservation of the carrying capacity of remaining productive habitat.

The Western Toad core forest habitat at Summit Lake is obviously the most strategic site remaining for BC Hydro / FLNRO to meet Compensation / Water Licence obligations.

It is the time and the place to implement the well-written vision, goals, objectives, activities and anticipated success measures outlined within the Ecosystem / Wildlife Program Plans and the FWCP's Action Plans.

FWCP Columbia Communications Coordinator, Angus Glass - FWCP News Toadfest 2013; “While the western toad population is still healthy at Summit Lake, we want to do everything we can to keep it that way. In North America we have seen their numbers decline significantly, and this Province is now the centre for western toad distribution in the world.”
Following massive population, aquatic and terrestrial habitat losses elsewhere, the Summit Lake western toad population and core forest habitat are under serious threat from multiple stressors impacting breeding, migration, summer and winter habitats.

Local impacts include;
1) Highway #6; 2) Residential settlement - Ruby Range Road, Island View Road and Kingfisher Road; 3) Three Island Resort Campgrounds; 4) Summit Lake Provincial Campground, parking lots and rail trail; 5) Summit Lake Ski Hill; 6) Forestry; 7) Climate Change; 8) Proposed multi-use motorized recreation.

Within the Rosebery to Summit Lake Trail Network ; FLNRO Section 57 Application document, it is noted the trails pass through sensitive ecosystems that include habitat for sensitive species including grizzly bears and western toads and these values will be maintained and the entire trail network will be managed to minimize the negative impacts of all human uses.

Unfortunately the proposed mitigation actions for the “protection of wildlife” will not prevent the increase killing of Summit Lake toads and toadlets. Brochures, trail kiosks, signage for warnings, closures, trail information, trail etiquette, emergency contacts and governing regulations will not protect the ecology or conserve the western toad population from ATV use on the trails and logging roads within Summit Lake core forest habitat, or BC Parks Goals 2 rail trail.

In closing:
Of particular concern is the cumulative impacts contributing to substantial population losses of toads and toadlets from and detrimental habitat fragmentation caused by highway mortality and the maze of logging roads, series of clearcuts, recreation and residential use.

We do not support the motorized use designation in the trail section #6 within the Summit Lake Goals 2 Protected Area (rail trail) or within the proposed Goal 2 Park expansion (663 Ha.) South Summit western toad core habitat area (section #16).

Sections of the Rosebery Trail have non-motorized designation and Summit Lake Trails require the non-motorized designation.

Thank you.
All the best,

Grant Trower
Wildlife Habitats for Tomorrow
**FACTOADS!**

Western Toad – Fact Sheet

What are the differences between frogs and toads?

<table>
<thead>
<tr>
<th>Frogs</th>
<th>Toads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smooth - moist skin</td>
<td>Bumpy dry skin with glands</td>
</tr>
<tr>
<td>Long hind legs (for hopping)</td>
<td>Short hind legs (for walking instead of hopping)</td>
</tr>
<tr>
<td>Eggs in clusters (masses)</td>
<td>Eggs in long strings</td>
</tr>
<tr>
<td>Local example: Pacific tree-frog</td>
<td>Local example: Western toad</td>
</tr>
<tr>
<td>No parotoid (poison) glands</td>
<td>Parotoid (poison) glands behind each eye</td>
</tr>
</tbody>
</table>

Frogs and toads are both amphibians (means "double life" because most have an aquatic, gill-bearing tadpole stage and an air-breathing adult stage that lives partially or almost entirely on land).

**Facts and Life History of Western Toads**

- Listed federally as a species of concern and are Blue-listed (vulnerable) in the Province
- Facing a combination of threats: habitat loss and destruction, road mortality, disease, pollution, introduced predators, global warming and increased UVB
- Three seasonal movements each year at Summit Lake: adults descend from upland habitat in spring to breed in the lake; return to upland habitat a few weeks later. Upon metamorphosis in late summer, toadlets migrate once (in late summer) from lake to upland habitat where they disperse and mature
- Adults migrate at night, toadlets during the day
- Explosive breeders (large congregations come together to compete for a mate), in early spring
- External fertilization occurs during amplexus (mating)
- Each egg string has up to 17,000 (on average 12,000) and can be several metres long
- Eggs hatch in 3 to 12 days (depending on water temperature)
- Tadpoles often swim together in huge aggregations in the warm shallow areas of the breeding ponds
- Tadpole development takes 6 to 8 weeks
- Life expectancy in the wild is 9 to 11 years (under good conditions) – there is a record of a toad that lived 36 years in captivity!
- Only 1% survival from egg to reproductive adult in a healthy population; when there is significant road mortality this rate goes down.
- The toadlets migration typically lasts between 4-6 weeks.
- They hibernate in burrows up to 1.3m underground, below the frost line
- 95% of their diet consists of insects, ants, beetles, crayfish, spiders, slugs, earthworms and centipedes
- They are not "warts" on the back of western toads, but glands that produce a bitter sticky white fluid when the toad feel threatened, that can cause the eyes or mouth of a would-be predator to tingle or feel numb and give an unpleasant taste. They also have large kidney-shaped parotoid glands behind the eyes that secret poison
Western toads are important because they are an indicator of ecological health and an important part of complex food web. Their distribution is shrinking and the centre of the world’s distribution has shifted from the USA to B.C.

The Situation at Summit Lake
- Importance of this site in the region: significant breeding area
- The toadlet migration is estimated to be in the millions
- Road mortality (adults and young) – occurs 3 times per year
  - Each year hundreds of thousands of recently metamorphosed toadlets are squished on the road (as they follow their instinct to move from the lake to upland habitat)
  - In 2009 over a two day period an estimated 90,000 dead toadlets were found along a one kilometre stretch of the road
  - Adults are also killed both on their way down to the lake to breed, and on their way back up the mountain
  - Takes 4-6 years for adults to become sexually mature and each female only mates once per year (and may not breed every year)

The Western Toad Project at Summit Lake
This project will assess the timing, severity and location of mortality with the end goal of designing permanent mitigation strategies such as fencing and highway underpass structures. Work includes:
- Adult and juvenile highway surveys to find mortality hotspots (Apr-Sept)
- Adult breeding surveys to determine main breeding areas (Apr-Jul)
  - There are seven main breeding sites known at Summit Lake
- Adult mark-recapture will help determine adult population breeding at Summit Lake
  - Adults marked with a unique 2mm PIT-tag, requiring no battery and lasts forever
  - Since 2011, researchers have marked 2,500 adult toads
- New, larger, concrete tunnel installed by MOTI, July 2014 (1.8m wide x 1.2m high). Wildlife fencing installed by FLNRO to guide adults and toadlets into tunnels.
- Additional wildlife fencing installed for 2015 around toad tunnels; tunnel and fencing proving very effective in reducing road mortality
  - 2015 toadlet migration hotspots were near the ski hill, and between the rest area and Provincial Park.

Additional Internet resources
2. British Columbia Frogwatch at http://www.env.gov.bc.ca/wld/frogwatch/
3. Amphibiaweb at http://amphibiaweb.org

TOADFEST is organized by the Fish & Wildlife Compensation Program with support from Ministry of Forests Lands and Natural Resource Operations; B.C. Parks; Columbia Basin Trust; and the Ministry of Transportation & Infrastructure with support from YRB.

Fact sheet prepared by:
Perfect weather, a high number of Western Toadlets, and lots of people, all helped to produce a successful Toadfest at Summit Lake Provincial Park south of Nakusp in August 2012.

Over 500 people helped carry toadlets cross the road and enjoyed the on-site activities last year. While the goal was primarily educational, to raise awareness about the importance of this breeding site for Western Toads, an estimated 14,750 toadlets were safely moved across Highway 6.

“We were extremely pleased with the turn-out, and the enthusiasm from those attending to help, and learn about, the toadlets,” said organizer and FWCP-Columbia communications coordinator, Angus Glass. The event was put on by B.C. Parks, Ministry of Environment, Ministry of Transportation and Infrastructure, Columbia Basin Trust, Yellowhead Bridge and Construction and the FWCP.

Toadfest is an outreach component of the Western Toad Project, now in its fourth year. The research and monitoring work, supported in part by the FWCP, develops and recommends long-term solutions to the high toad mortality on the road.

“So far, we have recorded over 100 recapture events from 950 adult toads which have been permanently marked with PIT tags since 2011,” said researcher Jakob Dulisse. “It appears that 2012 was a good breeding year.”

“While the Western Toad population is still healthy at Summit Lake, we want to do everything we can to keep it that way,” added Glass. “They are an important part of the ecosystem, but in North America we have seen their numbers decline significantly, and this province is now the center for Western Toad distribution in the world. Helping people connect with nature in this fashion will help with long term conservation of the western toad which is listed federally as a species of Special Concern.”

TOADFEST 2013: tentative dates are August 27 and 28, but check fwcp.ca later this summer for confirmation.
Securing land for present and future generations is the most effective means to ensure that key parcels of fish and wildlife habitats are protected from non-compatible usage. Learning and experiencing the wonders of nature, and providing a healthy environment are the best legacies we can offer our children and grandchildren across the Columbia Basin.
Briefing Note for the FWCP Columbia Board

May 31, 2016
Crystal Klym, FWCP Columbia Region Manager

Subject
Summit Lake western toads: public concerns regarding proposed Nakusp and Area Community Forest (NACFOR) logging and role of FWCP.

Issue
Summit Lake, which is approximately 15 km southeast of Nakusp and adjacent to Highway 6, hosts a significant breeding population of western toads (*Anaxyrus boreas*). Substantial numbers of adult and juvenile toads (toadlets) are killed by vehicle traffic every year on Highway 6 as they migrate to and from Summit Lake (Dulisse, 2013). FWCP has been supporting toad conservation and awareness work in the area since 2010. Over the past several months there has been public concern regarding proposed logging activities in the Summit Lake area by NACFOR. These concerns have garnered significant media attention and resulted in a number of public inquiries as to FWCP's investment and involvement in Summit Lake western toad conservation activities.

Background
- The western toad is internationally listed as Near Threatened by the World Conservation Union, federally listed as Special Concern by the Committee on the Status of Endangered Wildlife in Canada and Blue-listed by the B.C. Conservation Data Centre (Dulisse, 2013). In addition, the western toad is identified as a priority species in the following FWCP Columbia Action Plans: Species of Interest, Riparian & Wetlands, and Small Lakes.
- There are three main migrations as adults move to and from the lake for breeding and toadlets leave the lake for upland habitat (Dulisse, 2013). These habitats are transected by Highway 6 thus vehicle mortality is high as western toads cross the highway either *en masse* (toadlets) or individually (adult toads). Adult toad mortality on highway 6 is considered the most significant factor affecting the population.
- In the summer of 2014, the Ministry of Transportation and Infrastructure (MOTI) installed a new toad tunnel (1.8m wide) under Highway 6 at Summit Lake to help reduce western toad mortality as they cross the road to and from the lake. Permanent fencing is now (2016) installed at the site.
- A portion of NACFOR’s Summit Lake operating area lies upslope from an existing Lands Act S. 16 map reserve adjacent to Highway 6 and upslope of the well-known breeding habitat of the western toad along the shores of Summit Lake. NACFOR has initiated work to develop a cutting permit with seven cutblocks, five to seven hectares in size, in the Summit Lake operating area. As part of the cutting permit development process, NACFOR completes numerous assessments to ensure due diligence and legal obligations for the project can be met.¹
- Through a (long-term) letter of agreement with the Ministry of Forests, Lands and Natural Resource Operations (FLNRO), the FWCP Columbia has supported Summit Lake western toad research and conservation activities since 2010 with a financial contribution of over $360,000. In 2016, activities include continuation of an ongoing western toad population assessment, construction, maintenance

¹ See NACFOR’s publication: Western Toad Management at Summit Lake

Revised: 31 May 2016
and monitoring of highway fencing at the (Highway 6) highway site and supporting the annual ToadFest event.

- Jakob Dulisse is the consultant who is working on contract with FLNRO (through the long-term agreement to deliver core fish and wildlife projects) on Summit Lake western toad research. This project has multiple partners including BC Parks, MOTI, FLNRO, Columbia Basin Trust (CBT) and the FWCP. Primary funders for the Toad research project have been CBT and the FWCP. The research project includes collecting field data, producing data summaries, data analysis and report writing for western toads at the Summit Lake population study area. Specific activities include adult toad mark-recapture data; migration of adult toads and toadlets; assessment and testing of mitigation structures; and recommendations for any changes to fencing and tunnels that may be required to reduce mortality.

- To learn more about western toad requirements for upland habitat NACFOR has supported the Summit Lake toad research project, which is expected to help identify forest management strategies and activities that will mitigate impacts to the western toad population and its habitat in the Summit Lake area. NACFOR provided Jakob with funding for telemetry, Regional FLNRO provided transmitters and they also provided in kind support on fence maintenance and construction. With input from FLNRO (FWCP section) staff, contractor Jakob Dulisse developed a draft document entitled “Western Toad Habitat Considerations for Forestry Operations”.

 Locally, this topic has generated a great deal of public interest and inquiries directed to all those involved in the project including, but not limited to, the FWCP, MFLNRO, NACFOR, CBT, and local biologists (see below for media examples). Based on correspondence received from concerned members of the public, some of the key concerns appear to include:

- the potential impacts of NACFOR’s proposed harvesting activities on western toads and their upland (terrestrial) habitat; adequacy of communication with the public
- potential loss of FWCP and partner financial investment in the conservation of western toads at Summit Lake if logging were to proceed
- perception that FWCP is supporting the logging of toad habitat by providing input into Habitat Considerations document
- recommendation to remove lands from NACFOR’s tenure, S. 16 Land Act reserve and add to provincial park to protect toad upland habitats

- Media coverage of this topic has been fairly extensive, examples include: Valley Voice (March 9, 2016 edition) – see digital pages 3, 4, 5, 6, and 9; Western toad protection at risk from logging, say environmentalists (CBC); Tiny western toads put squeeze on village of Nakusp (Times Colonist); Nakusp Toad Migration in Danger (Watershed Sentinel); Tiny western toads put economic, environmental squeeze on village of Nakusp (The Vancouver Sun); Help the Summit Lake toads survive (Nelson Star)

- To date, the Columbia Region Manager has received, and responded to, three formal public inquiries requesting information on the FWCP investment in Summit Lake western toad conservation activities. In addition, the Columbia Region Manager has met with Debbie Pitaoulis in-person to clarify the role of the FWCP in this matter.

Revised: 31 May 2016
August 23, 2007

Grant Trower, Chair  
Friends of the Lardeau River  
Box 1088  
Kaslo, BC  
V0G 1M0

Dear Mr. Trower;

Re: Protected Area Strategy Goal 2 Candidate Areas

As requested, please find enclosed a large-format map depicting the Protected Area Strategy (PAS) Goal 2 “A” List Candidate Areas in the Kootenay Region, and a small-format map showing the detail of the PAS site on the Lardeau River. In addition you will also find some background information and a list of all PAS Goal 2 “A” List Candidate sites in the West Kootenay-Boundary Region.

As you noted, your Regional District Director, Mr Andrew Shadrack, has been provided with this information. If you have questions or concerns please contact me at 250-426-1761 or Greg Chin at 250-489-8558.

Sincerely,

Pamela Cowtan  
Planning Team Leader - East Kootenay  
Regional Client Services Division

cc: Greg Chin, Planning Officer, Ministry of Environment  
Andrew Shadrack, Regional District Director, Electoral Area D

Attachments (4)
January 18, 2006

Mr. Grant Trower
Box 1088
Kaslo BC V0G 1M0

Dear Grant:

I have attached the “B” and “C” list for your information.

The Kootenay Boundary Land Use Plan allocated 10,500 ha for Goal 2 parks. Work on the over 80 candidate areas ranged from full agency support to limited support based on a number of social, economic and/or environmental issues.

Currently Land Act Section 16 reserves are being placed on all the IAMC approved “A” list Goal 2’s.

If you have any further questions please don’t hesitate to call.

Sincerely yours,

Sangita Sudan
Planning Officer

SS/sf

Attachments
West Kootenay-Boundary Protected Areas Strategy (PAS) Goal 2

Backgrounder

The March 1995 West Kootenay-Boundary Land Use Plan set aside over 11% of the region in large, representative “Goal 1” protected areas. The Plan stated that a local planning process would identify a further 0.25% (10,500 ha) for protection of small sites. This would bring the total protected area percentage in the West Kootenay-Boundary to 11.3%. These sites, known as “Goal 2” sites, would protect special natural, recreational or cultural features. Many sites offer regional direct and indirect economic benefits for recreation and tourism.

In 1998, a process to identify Goal 2 sites was initiated and Special Features site nominations were invited from an extensive list of stakeholder groups, organizations, First Nations, government and individuals. Special Features were defined as “elements or groups of elements made special by their rarity, scarcity and unique significance in intrinsic or perceived worth”. From that list, 123 sites were evaluated through a 3-step screening process where top candidates were added to an "A list". In 2000, the "A" list of 22 sites was signed off by the Interagency Management Committee (IAMC).

This “A” list has recently been reviewed and endorsed by the Kootenay Boundary Managers Committee. The Ministry of Environment is now consulting with local government and First Nations on these candidate sites. Candidate areas range in size from 1 to 715 hectares with an average size of 258 hectares. Before finalizing any new park proposals for government’s consideration, there will also be a final review by the KBMC and the list will be presented to government with a recommendation that the area be established as a park or protected area.

Provincial Parks are established by the Park Act and are free of mining, forest harvesting and hydro electric development. Protected Areas are established by Order in Council under the Environment and Land Use Act to protect an area or portion of a park where there is a need to allow a future or existing use that would not be compatible with the Park Act, such as an industrial road or mineral claim. After these considerations, both Parks and Protected Areas are essentially managed the same.
Hi Elsje:

Please see attached Goal 2 site (A list), this list totals up to 5,111 hectares.

The Goal 2 allocation as agreed to following the land use plan was to identify an area up to a maximum budget of 10,500 hectares.

Three Goal 2 sites were established (they are not on the attached list). They are Gilpin Grasslands (791 ha, 2007), Boothmans Oxbow (42 ha, 2007), and the Gimli Peak addition to Valhalla Provincial Park (635 ha, 1999).

This leaves 3,921 hectares.

Hope these numbers provide some clarity for you.

Regards,

Keith

Keith J. Baric MSc
Planning Section Head (Kootenay-Okanagan)
BC Parks and Conservation Officer Service Division

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## West Kootenay-Boundary

### Protected Areas Strategy (PAS) Goal 2

#### "A" List

**August 10 2007**

<table>
<thead>
<tr>
<th>Regional District/ Electoral Area</th>
<th>Ref #</th>
<th>Name</th>
<th>Area (ha)</th>
<th>Feature</th>
<th>PAS Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDCK/JD</td>
<td>1</td>
<td>Blue Ridge</td>
<td>337</td>
<td>Cultural Heritage</td>
<td>Concentration of Archeological sites including argillite quarry</td>
</tr>
<tr>
<td>RDCK/KH</td>
<td>4</td>
<td>Brenner Delta Old Growth</td>
<td>424</td>
<td>Biological</td>
<td>Interior Cedar Hemlock old growth forest &amp; riparian habitat</td>
</tr>
<tr>
<td>RDCK/KD</td>
<td>8</td>
<td>Cody Caves Expansion</td>
<td>30</td>
<td>Landform &amp; Recreation</td>
<td>Extensive limestone cave formation</td>
</tr>
<tr>
<td>RDCK/KK</td>
<td>21</td>
<td>Halfway River Hot Springs</td>
<td>44</td>
<td>Hydrological &amp; Recreation</td>
<td>Accessible and significant natural hot spring. Significant climbing site</td>
</tr>
<tr>
<td>RDCK/KD</td>
<td>22</td>
<td>Howser Spire</td>
<td>365</td>
<td>Landform &amp; Recreation</td>
<td>Significant commercial and public climbing site adjacent to Bugaboo Park</td>
</tr>
<tr>
<td>RDCK/A</td>
<td>26</td>
<td>Jack and Cory Creek (deferred)</td>
<td>430</td>
<td>Biological</td>
<td>Red-listed Cœur d'Alene salamander habitat</td>
</tr>
<tr>
<td>RDCK/EL</td>
<td>27</td>
<td>Johnstone Creek</td>
<td>29</td>
<td>Biological</td>
<td>Grassland addition to existing Provincial Park</td>
</tr>
<tr>
<td>RDCK/A</td>
<td>29</td>
<td>Kettle River Recreation Area</td>
<td>182</td>
<td>Biological, Cultural &amp; Recreation</td>
<td>Popular campground beside Kettle River. Old Growth Ponderosa Pine and river valley. Townsend's Big Eared Bats. Portion of Kettle Valley Railroad</td>
</tr>
<tr>
<td>RDCK/EL</td>
<td>31</td>
<td>Kokanee Creek Ecological Reserve</td>
<td>214</td>
<td>Biological</td>
<td>Ponderosa Pine stand not normally found in this biogeoclimatic zone</td>
</tr>
<tr>
<td>RDCK/A</td>
<td>32.d</td>
<td>Kootenay Lake Shoreline System - Tye Creek</td>
<td>41</td>
<td>Natural, Recreation and Cultural</td>
<td>Part of a system of small lakeshore sites along Kootenay Lake. Public recreation - boating and beach</td>
</tr>
<tr>
<td>RDCK/A</td>
<td>32.a</td>
<td>Kootenay Lake Shoreline System - Pebble Beach</td>
<td>14</td>
<td>Natural, Recreation and Cultural</td>
<td>Part of a system of small lakeshore sites along Kootenay Lake. Public recreation - boating and beach</td>
</tr>
<tr>
<td>RDCK/A</td>
<td>32.f</td>
<td>Kootenay Lake Shoreline System - Harlequin Island</td>
<td>1</td>
<td>Natural, Recreation and Cultural</td>
<td>Part of a system of small lakeshore sites along Kootenay Lake. Public recreation - boating and beach</td>
</tr>
<tr>
<td>RDCK/A</td>
<td>32.g</td>
<td>Kootenay Lake Shoreline System - Irvine Creek</td>
<td>13</td>
<td>Natural, Recreation and Cultural</td>
<td>Part of a system of small lakeshore sites along Kootenay Lake. Public recreation - boating and beach</td>
</tr>
<tr>
<td>RDCK/A</td>
<td>32.h</td>
<td>Kootenay Lake Shoreline System - Wilson Creek</td>
<td>5</td>
<td>Natural, Recreation and Cultural</td>
<td>Part of a system of small lakeshore sites along Kootenay Lake. Public recreation - boating and beach</td>
</tr>
<tr>
<td>RDCK/A</td>
<td>32.i</td>
<td>Kootenay Lake Shoreline System - Troup Junction</td>
<td>21</td>
<td>Natural, Recreation and Cultural</td>
<td>Part of a system of small lakeshore sites along Kootenay Lake. Public recreation - boating and beach</td>
</tr>
<tr>
<td>RDCK/EL</td>
<td>32.j</td>
<td>Kootenay Lake Shoreline System - Burdena Cut</td>
<td>3</td>
<td>Natural, Recreation and Cultural</td>
<td>Part of a system of small lakeshore sites along Kootenay Lake. Public recreation - boating and beach</td>
</tr>
<tr>
<td>RDCK/A</td>
<td>32.k</td>
<td>Kootenay Lake Shoreline System - Crawford Bay</td>
<td>7</td>
<td>Natural, Recreation and Cultural</td>
<td>Part of a system of small lakeshore sites along Kootenay Lake. Public recreation - boating and beach</td>
</tr>
<tr>
<td>RDCK/EL</td>
<td>32.l</td>
<td>Kootenay Lake Shoreline System - Fletcher Falls</td>
<td>3</td>
<td>Natural, Recreation and Cultural</td>
<td>Part of a system of small lakeshore sites along Kootenay Lake. Public recreation - boating and beach</td>
</tr>
<tr>
<td>RDCK/EL</td>
<td>33</td>
<td>Kootenay Lake North End</td>
<td>165</td>
<td>Biological</td>
<td>Large riparian area &amp; protects White Sturgeon habitat. Adjacent to wildlife management area</td>
</tr>
<tr>
<td>RDCK/EL</td>
<td>34</td>
<td>Lardeau River</td>
<td>716</td>
<td>Biological, Recreation and Cultural</td>
<td>Protects Bull Trout &amp; Gerrard Trout habitat. Rich riparian habitat</td>
</tr>
<tr>
<td>RDCK/EL</td>
<td>36</td>
<td>Molly Creek Cedars</td>
<td>10</td>
<td>Biological and Recreation</td>
<td>Old growth cedar</td>
</tr>
<tr>
<td>RDCK/EL</td>
<td>37</td>
<td>Renata Natural Arch</td>
<td>102</td>
<td>Landform &amp; Recreation</td>
<td>Large natural bedrock arch accessible by boat or trail</td>
</tr>
<tr>
<td>RDCK/EL</td>
<td>38</td>
<td>Randell Creek</td>
<td>296</td>
<td>Biological</td>
<td>Old growth forest. Grizzly bear habitat and Speckled Dace</td>
</tr>
<tr>
<td>RDCK/EL &amp; RDNO</td>
<td>43</td>
<td>Summit Lake Park Expansion</td>
<td>486</td>
<td>Hydrological, Recreation and Cultural</td>
<td>Public recreation - boating and foreshore</td>
</tr>
</tbody>
</table>

### Notes

1. The BC government has identified Summit Lake as provincially significant for the blue listed Western Toad. The Western Toad is listed as one of the three "Priority One" amphibian species in the 2011 report "Dam Footprint Impact Summary" by *Fish & Wildlife Compensation Program along with the Northern Leopard Frog and the Wood Frog.*

---

**Impact Summary**

- **Fish & Wildlife Compensation**
- **Hydrological, Recreation & Cultural**
- **Landform, Recreation & Cultural**
- **Public recreation, camping, beaches**
- **Public recreation boating and beaches**

**TOTAL** 8795
<table>
<thead>
<tr>
<th>Name</th>
<th>Area (ha)</th>
<th>PAS Value</th>
<th>Risk Factor/Conflict</th>
<th>Regional Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boothman's Oxbow</td>
<td>109</td>
<td>Remnant riparian feature</td>
<td>Med. - MOU agreed to for cattle grazing</td>
<td>protects rare dry habitat site with many rare species for study and guided viewing</td>
</tr>
<tr>
<td>Gilpin</td>
<td>810</td>
<td>rare habitat PP Point w/ red listed species</td>
<td>Med. - MOU agreed to for cattle grazing</td>
<td>protects rare dry habitat site with many rare species for study and guided viewing</td>
</tr>
<tr>
<td>Murray Gulch</td>
<td>504</td>
<td>grassland and dry Gulch &amp; rare species</td>
<td>Med. - MOU agreed to for cattle grazing</td>
<td>protects rare dry habitat site with many rare species for study and guided viewing</td>
</tr>
<tr>
<td>Blue Ridge Expansion</td>
<td>69</td>
<td>First Nations quarry site</td>
<td>Med. Timber concerns</td>
<td>Protects important archeological site (First Nations argellite quarry)</td>
</tr>
<tr>
<td>Halfway River Hot Springs Expansion</td>
<td>30</td>
<td>hot spring seeps &amp; unusual plants</td>
<td>Med. Timber concerns</td>
<td>Protects hot spring seeps and unusual plants</td>
</tr>
<tr>
<td>Koot. L.- Twenty minute Point</td>
<td>2</td>
<td>Archeological site and foreshore</td>
<td>Low - Agreed to by all agencies</td>
<td>protects archeological site and foreshore</td>
</tr>
<tr>
<td>Koot. L.- 2 Creeks, s. of Irvine Cr.</td>
<td>4</td>
<td>Archeological site and foreshore</td>
<td>Low - Agreed to by all agencies</td>
<td>protects archeological site and foreshore</td>
</tr>
<tr>
<td>Koot. L.- 1st Point, s. of Wilson Cr.</td>
<td>32</td>
<td>Archeological site and foreshore</td>
<td>Low - Agreed to by all agencies</td>
<td>protects archeological site and foreshore</td>
</tr>
<tr>
<td>Koot. L.- 2nd Point, s. of Wilson Cr.</td>
<td>5</td>
<td>Archeological site and foreshore</td>
<td>Low - Agreed to by all agencies</td>
<td>protects archeological site and foreshore</td>
</tr>
<tr>
<td>Koot. L.- n. of Blake - Heather Cr.</td>
<td>12</td>
<td>beach and foreshore</td>
<td>Check status of old cabin</td>
<td>enhances &amp; expands public &amp; commercial opportunities, tourism, marinas, houseboats</td>
</tr>
<tr>
<td>Koot. L.- 1st Point, s. of Blake</td>
<td>7</td>
<td>Archeological site and foreshore</td>
<td>Low - Agreed to by all agencies</td>
<td>protects archeological site and foreshore</td>
</tr>
<tr>
<td>Koot. L.- 2nd Point, s. of Blake</td>
<td>8</td>
<td>Archeological site and foreshore</td>
<td>Low - Agreed to by all agencies</td>
<td>protects archeological site and foreshore</td>
</tr>
<tr>
<td>Koot. L.- 2 Cr., N. of Rhinoceros Pt.</td>
<td>11</td>
<td>Archeological site and foreshore</td>
<td>Low - Agreed to by all agencies</td>
<td>protects archeological site and foreshore</td>
</tr>
<tr>
<td>Koot. L.-Rhinoceros Point</td>
<td>6</td>
<td>beach and foreshore</td>
<td>Low - Agreed to by all agencies</td>
<td>protects archeological site and foreshore</td>
</tr>
<tr>
<td>Koot. L.- Cr., s. of Rhinoceros Pt.</td>
<td>2</td>
<td>Archeological site and foreshore</td>
<td>Low - Agreed to by all agencies</td>
<td>protects archeological site and foreshore</td>
</tr>
<tr>
<td>Koot. L.- Cr., n. of Junice Cr.</td>
<td>7</td>
<td>Archeological site and foreshore</td>
<td>Low - Agreed to by all agencies</td>
<td>protects archeological site and foreshore</td>
</tr>
<tr>
<td>Koot. L.- 1st Point, n. of Junice Cr.</td>
<td>8</td>
<td>Archeological site and foreshore</td>
<td>Low - Agreed to by all agencies</td>
<td>protects archeological site and foreshore</td>
</tr>
<tr>
<td>Koot. L.- Junice Creek</td>
<td>17</td>
<td>beach and foreshore</td>
<td>Low - Agreed to by all agencies</td>
<td>protects archeological site and foreshore</td>
</tr>
<tr>
<td>Koot. L.- North Drewry</td>
<td>10</td>
<td>Archeological site and foreshore</td>
<td>Low - Agreed to by all agencies</td>
<td>protects archeological site and foreshore</td>
</tr>
<tr>
<td>Koot. L.- South Drewry</td>
<td>26</td>
<td>Archeological site and foreshore</td>
<td>Low - Agreed to by all agencies</td>
<td>protects archeological site and foreshore</td>
</tr>
<tr>
<td>Koot. L.- South Midge</td>
<td>7</td>
<td>beach and foreshore</td>
<td>Low - Agreed to by all agencies</td>
<td>protects archeological site and foreshore</td>
</tr>
<tr>
<td>Koot. L.-Next Creek</td>
<td>19</td>
<td>beach and foreshore</td>
<td>Low - Agreed to by all agencies</td>
<td>protects archeological site and foreshore</td>
</tr>
<tr>
<td>Koot. L.-Shaw Creek</td>
<td>8</td>
<td>beach and foreshore</td>
<td>Low - Agreed to by all agencies</td>
<td>protects archeological site and foreshore</td>
</tr>
<tr>
<td>Waneta</td>
<td>122</td>
<td>White Sturgeon viewing, dry habitat</td>
<td>High - conflicts with utility corridors</td>
<td>White Sturgeon viewing opportunity</td>
</tr>
<tr>
<td>Fox Tree Hill</td>
<td>159</td>
<td>remnant natural valley bottom site</td>
<td>High - conflicts with RDC &amp; 1st Nations</td>
<td>public hiking and viewing</td>
</tr>
<tr>
<td>Stagleap Hill</td>
<td>options</td>
<td>high value Caribou habitat</td>
<td>Med/ High - timber and minerals conflict</td>
<td>protects critical area of occupied Caribou habitat</td>
</tr>
<tr>
<td>Tenise</td>
<td>449</td>
<td>old growth cedar/hemlock stand</td>
<td>High - timber conflicts</td>
<td>public and commercial viewing opportunities of old growth trees and rare lichens</td>
</tr>
<tr>
<td>Cascade Canyon</td>
<td>200</td>
<td>historic power site and waterfall</td>
<td>High pos. conflict w/ power generation</td>
<td>public viewing and historic interpretation</td>
</tr>
<tr>
<td>Boundary Falls</td>
<td>43</td>
<td>historic trade route &amp; power site</td>
<td>Low - UREP reserve</td>
<td>public viewing and historic interpretation</td>
</tr>
<tr>
<td>Downie Creek Campsite</td>
<td>111</td>
<td>former BC Parks campground, boat launch</td>
<td>Med-mineral claim</td>
<td>public or commercial camping and boat launch</td>
</tr>
<tr>
<td>Perry's Island</td>
<td>9</td>
<td>small Island in the Slocan River</td>
<td>Low</td>
<td>protects small island and public recreation</td>
</tr>
<tr>
<td>Pilot Peninsula/sw</td>
<td>221</td>
<td>high value UWR, beaches, rare orchid</td>
<td>Low/Med - Timber</td>
<td>enhances &amp; expands public &amp; commercial opportunities, tourism, marinas, houseboats</td>
</tr>
<tr>
<td>Salmo R. Cottonwoods (2 sites)</td>
<td>83</td>
<td>riparian area, Harlequin Ducks</td>
<td>Unknown</td>
<td>protects Harlequin Ducks and riparian area</td>
</tr>
<tr>
<td>Gibson L. Rd - Old Growth</td>
<td>?</td>
<td>popular trail in old growth Cedar stand</td>
<td>Med. - timber conflicts</td>
<td>excellent opportunity for guided viewing by existing or new commercial operators</td>
</tr>
<tr>
<td>Monica Meadows</td>
<td>?</td>
<td>popular alpine meadow</td>
<td>Low -</td>
<td>excellent opportunity for guided viewing by existing or new commercial operators</td>
</tr>
<tr>
<td>Summit Lake Expansion</td>
<td>54</td>
<td>lake foreshore &amp; old railway grade</td>
<td>Low</td>
<td>lake is popular and old railway grade is used by public and commercial operators</td>
</tr>
</tbody>
</table>

Total 3164
The only responsible and reasonable solution is to protect this very small habitat area (663ha.) of immature forest from the operational forest and NACFOR's tenure, reallocate the cut blocks elsewhere within the 10,000 ha. tenure. Expand the Goal 2 status already there to include this exceptional ecosystem which is a highly publicized special feature. This area constitutes less than 6.5% of NACFOR's tenure but would preserve 95% of core terrestrial habitat where these toads spend 99% of their lives (8 years).
Wildlife Habitats for Tomorrow

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250-366-4375
Photos and video reveal Western Toads found throughout forest slated to be logged in Nakusp

Toadlets found squashed on the road while NACFOR prepares to log

NAKUSP, BC – A recent photo and video expedition has revealed thousands of Western Toads are dispersing into their forested habitat that is slated to be imminently logged. The images and video show toads under logging equipment, on logging roads as well as on branch roads into the logging cut blocks. Branch roads were constructed in February 2016.

In the fall of 2015, Nakusp Community Forest (NACFOR) was given permission by the BC government to log the habitat of one of the province’s most important populations of Western Toad, a blue-listed species at risk in BC.

“British Columbia spent $750,000 to build a tunnel to protect these toads from highway deaths as they migrate from Summit Lake to the surrounding forest,” says Gwen Barlee, national policy director with the Wilderness Committee. “Now, the government is allowing their forested habitat to be destroyed. Toads are already getting squashed on logging roads as NACFOR moves in logging equipment right while the toads’ spring dispersal is in full swing.”

Only last week, NACFOR has started grading the logging roads while hundreds of toads were migrating across it.

“Now they have brought in a feller-buncher, which means logging could begin at any time,” says Craig Pettitt, a director of the Valhalla Wilderness Society. “We recorded young toads all around their machine. We are outraged that the government and NACFOR would allow logging in critical toad habitat when it is clear toads will be killed left, right and centre.”

At an Open House held May 19, the public was shocked to hear NACFOR foresters state that they knew that their logging operations would kill toads, but that they are going ahead with logging regardless. The statements by these foresters shows a total disregard for any of the best management practices literature they have provided the public on NACFOR’s website.

“The Western Toad is disappearing from the U.S. and parts of southern BC, and habitat loss and fragmentation are recognized by scientists as one of the primary causes,” says Wayne McCrory, a biologist with the Valhalla Wilderness Society. “The Summit Lake population already suffers serious mortality on the main highway, and the logging activities will increase mortality. Whole populations of these toads have disappeared elsewhere which is why we must protect this provincially important population of western toads.”

The BC government’s Management Plan for the Western Toad recommends that as much forest habitat as possible be maintained, ‘adjacent to breeding sites to allow for hibernation, foraging, and other essential life functions.’ Government scientists acknowledge that the Summit Lake region is one of the key breeding areas for western toads in the Kootenay region, if not the entire province. In natural situations 99 per cent of young western toads will not survive their first year. For the Summit Lake toads this number is even higher because of highway mortality.
“Signage at Summit Lake proudly declares ‘BC the global keepers of the Western Toad,’ said Debbie Pitaoulis who lives near Summit Lake. "The BC government deserves to feel proud for investing time and money to get these toads off the highway and into the forest where they live more than 95% of their lifespan. But allowing the destruction of that very habitat is shameful and irresponsible. The BC government needs to step in and protect their core habitat for the toads, for the province and for the world."

For more information, please contact:

Wayne McCrory | Local Biologist, Valhalla Wilderness Society, 250-358-7796
Craig Pettitt | Forest Technician, Valhalla Wilderness Society, 250-358-7997
Gwen Barlee | National Policy Director, Wilderness Committee, 604-202-0322
Debbie Pitaoulis | Resident of Summit Lake, 250-265-3212

Additional media resources:

VIDEO: Summit Lake Western Toads on logging roads — password: We$terntoad
VIDEO: Intro to the Summit Lake Western Toad
PHOTOS: Western Toads near logging equipment at Summit Lake
(Please credit: Isaac Carter/WC Files)
Delivering the Ecosystems Program

The Ecosystems Program, like other areas of government, is faced with the challenge of identifying, developing and implementing new and innovative methods to achieve goals. We have responded in several ways.

Conservation priorities: The British Columbia Conservation Framework. The drivers and challenges previously described have traditionally generated reactive responses by the Ecosystems Program. The Conservation Framework represents a new and fundamentally different approach, a shift from reactive to proactive management of species and ecosystems, by providing a framework to:

- act sooner, to apply preventive conservation approaches before species and ecosystems become at risk, and to lessen the need to rely on reactive conservation (e.g., recovery, restoration);
- act smarter, ensuring that priority-setting is science-based, with proactive assignment of required conservation actions; and
- act and invest in a more coordinated way, by aligning resources with the highest conservation priorities and implementing actions across government and with stakeholders and partners.
**Strategy 1.2.a: Policy**

Lead, support and influence development of ministry and government policies to support sustainable environmental management; conservation and protection of species, habitat and ecosystems; and avoidance or reduction of impacts on these values, and support consistent application of these policies across industry sectors.

**Activities include:**
- Lead or support policy development or revision related to Ministry of Environment responsibilities and authorities in implementation of natural resource legislation.
- Lead, support and influence policy development for implementation of the *British Columbia Conservation Framework* across B.C. government ministries and agencies, including completion of policy for conservation priorities and actions; guide implementation of the *Framework*; and build support for application of the *Framework* among statutory decision-makers in resource agencies.

**Objective 2.5. Landscape Approaches to Conservation:** The Ecosystems Program works to develop and implement landscape-scale approaches to achieving desired conservation outcomes for species, habitat and ecosystems.

**Strategy 2.5.a: Core Lands for Conservation**

Lead and support conservation and management actions for conservation in B.C. parks, protected areas and conservation lands.

**Activities include:**
- Evaluate the effectiveness of provincial parks and protected areas in conserving biological diversity.
- Work with BC Parks staff to lead and support core conservation initiatives in parks and protected areas, including vulnerability and risk assessments, adaptive management, management planning, inventory and monitoring.
- Lead and support conservation projects and actions that cross park boundaries to adjacent lands.
- Work with BC Parks and other ministries to protect representative and proportional enduring landscape features (e.g., surficial materials, topographic diversity (climate change refugia) and geological features).

**Strategy 2.5.b: Landscape Connectivity**

Work with partners in BC Parks, other agencies and non-governmental organizations (NGOs) to analyze landscape connectivity and facilitate landscape-level management actions for species, habitat and ecosystems.

**Activities include:**
- Develop tools to evaluate landscape connectivity and identify key connection points.

**Strategy 2.5.c: Cumulative Effects**

Identify species, habitat and ecosystem values at the landscape scale, and assess and address cumulative effects of human activities and climate change on these values.

**Activities include:**
- Develop a conceptual, results-based approach to quantifying species and ecosystem management objectives within a landscape context as a basis to manage cumulative effects.
- Assess conservation uplift in areas affected by mountain pine beetle, in the context of increased allowable annual cut (AAC).

**Success Measures**
- Landscape condition and connectivity are given increasing consideration in management decisions by BC Parks and other agencies.
- An approach is developed to define management objectives for species and ecosystems within the landscape context as a basis for managing cumulative effects.
- Work of the Ecosystems Program contributes to improved understanding of cumulative effects.
Goal: Conserve species and maintain the health of wildlife populations in collaboration with our partners

The Wildlife Program has adopted the cross-government Conservation Framework, a goal-based set of methods and tools used to prioritize species and ecosystems for conservation action. The Conservation Framework has the following three goals:

1. to contribute to global efforts for species and ecosystems conservation
2. to prevent species and ecosystems from becoming at risk
3. to maintain the full diversity of native species and ecosystems

Healthy wildlife populations are fundamental to sustaining B.C's wildlife heritage. The Wildlife Program must work with other Ministry programs, agencies, First Nations, and stakeholders to design wildlife management actions that conserve, preserve, or maintain healthy species populations. Engaging others in becoming stewards of wildlife is critical to the success of the program.
British Columbia's wildlife is a public resource that holds intrinsic, environmental, economic, and social value. It also contributes significantly to ecological diversity at a provincial, national, and global level. By conserving and restoring native wildlife species and their habitats, we help ensure the sustainability of the province's wildlife resource and all of its associated benefits.

The Wildlife Program will use the Conservation Framework as its primary conservation planning, priority-setting, and management tool. This will ensure that our actions are aligned and co-ordinated across the province. This new approach will also guide internal business planning and allow wildlife managers to allocate resources and build business cases based on the framework's priorities.

A variety of legislation, regulations, policies, procedures, and best practices form the regulatory framework for managing wildlife and wildlife habitat in British Columbia. The Ministry is responsible for the Wildlife Act, which along with its associated 31 regulations, is the key piece of legislation that guides the Wildlife Program. The Park Act, Ecological Reserve Act, along with some designations made under both the Forest and Range Practices Act and the new Oil and Gas Activities Act (e.g. Wildlife Habitat Areas, Ungulate Winter Ranges, Wildlife Habitat Features) are also the responsibility of the Ministry. Decisions made under other pieces of legislation, such as the Land Act, federal Species at Risk Act, federal Fisheries Act, and those made by local governments, can have significant effects on wildlife. Having well designed, current, and efficient regulatory and policy tools will help the Ministry effectively influence those decisions.

As society shifts its values and government develops new ways of delivering programs and working with people, the Ministry will continually examine its legislation, regulations, policies, procedures, and practices to ensure it has the tools and information needed to effectively manage wildlife.

Our Strategies and Activities

Implement a co-ordinated and structured approach to managing species of conservation concern in B.C.

- Identify priority species for conservation management.
- Identify and implement appropriate management actions for priority species, including species assessments, inventory, planning, listing, habitat protection/restoration, and alien species control.
- Seek alignment of species conservation priorities and management actions across government and with partners and stakeholders.
- Track and report on conservation activities, by species and management action group, and on changes to status assessments of species and their habitats on an annual basis.

Our Strategies and Activities

Assess and improve the current regulatory framework for managing wildlife.

- Bring into force the Wildlife Amendment Act through regulation to protect species at risk and their residences.
- Review public comment and policy analysis on desired changes to the Wildlife Act. Identify, for Executive consideration, possible incremental changes to the Act.
The Columbia River has been extensively altered by dams built for flood control and hydroelectric power production in both Canada and the United States. The Fish and Wildlife Compensation Program: Columbia Basin (FWCP:CB) was established to offset footprint impacts of BC Hydro dams and reservoirs on fish and wildlife in the basin. Objectives of the FWCP:CB are to: 1) meet BC Hydro water license obligations with regard to compensation of fish and wildlife impacted by dam construction in the Columbia Basin, and 2) to sustain and enhance fish and wildlife populations by undertaking projects with potential to mitigate impacts resulting from BC Hydro projects. The FWCP:CB program area includes the BC portions of the Kootenay and Columbia drainages, east of the Monashee Mountains. The program addresses impacts related to 12 dams and associated reservoirs, including impacts on Kootenay Lake.

At the time of dam construction, the amount and quality of impact assessments for fish and wildlife were not sufficient to fully assess the significance of potential impacts to ecosystems and species, particularly poorly understood species. The lack of this information has made it difficult for agencies, program sponsors and stakeholders to assess the progress toward compensation for the range of dam impacts.

In 2005 the FWCP:CB undertook this project to update our understanding of the impacts of the dams, to support ongoing strategic and program planning, to assist in prioritization of compensation options, and to facilitate reporting the progress of addressing impacts. Study objectives included: improved quantification and increased understanding of the significance of the impacts to fish and wildlife, their habitats, ecosystem function and fish-wildlife interactions, and the identification of the range of compensation options.

The project is composed of five broad elements: 1) mapping of basic aquatic and terrestrial ecosystems within the dam footprints; 2) assessing changes in primary productivity; 3) assessing changes to aquatic and terrestrial habitats; 4) assessing impacts on individual fish and wildlife species; and 5) the identification of compensation options. This report is a summary of thirteen previous reports that document individual components of the five elements.

Pre-dam aquatic, wetland/floodplain and terrestrial ecosystems were mapped from pre-dam information sources, including aerial photographs, topographic maps and land class mapping. The ecosystem mapping demonstrated that each reservoir was unique with regard to the types, amounts and proportions of ecosystems impacted. The Arrow and Kinbasket Reservoirs occupy the largest footprints at 51,270 and 42,650 ha respectively. The Revelstoke (11,450 ha), Duncan (7,300 ha) and Kokanusa (6,885 ha) reservoirs are also fairly extensive. The Whatshan (1,770 ha) and Pend d'Oreille (430 ha) are somewhat smaller, and Kootenay Canal, Aberfeldie, Elko, Cranberry, and Spillimacheen reservoirs are less than 50 ha each (because of lack of data, footprint impacts of Aberfeldie, Elko and Cranberry are not discussed in the report). The pre-dam ecosystem composition of the Arrow and Whatshan Reservoirs were dominated by pre-existing lakes, while the Kinbasket, Revelstoke, Kokanusa, Pend d'Oreille, and Spillimacheen were dominated by forested ecosystems and large river systems, and the Kootenay Canal by forested ecosystems. The Duncan footprint included a complex mix of lakes, forests and wetlands. All footprints included varying lengths of river and/or stream ecosystems.

Primary productivity was calculated for the pre-dam aquatic, wetland/floodplain and upland ecosystems, and for the new reservoirs. Methods for determining primary productivity varied depending on the type of ecosystem; however, most pre-dam calculations relied on modeling and/or comparisons with other similar ecosystems in BC due to the lack of pre-dam information. Overall pre-dam gross primary productivity within the dam footprints was estimated at approximately 870,000 tons of C/yr, with approximately 95% of that from forested ecosystems. Post-dam reservoirs have an estimated gross primary productivity of about 29,600 tons of C/yr, resulting in a net loss of over 840,000 tons of C/yr. Variation in primary productivity changes between reservoirs was principally dependent on footprint area and the proportion of forested ecosystems.

Impacts on aquatic habitats were assessed by comparing the pre-dam habitats within the footprints with the total aquatic habitats within the Columbia Basin. Significant areas of lotic (riverine) habitats were lost because of...
DAM FOOTPRINT IMPACTS SUMMARY: COLUMBIA BASIN

Flooding (1600 linear km or 12,000 ha), with low elevation, low gradient rivers having the most significant losses. Lentic (lake/reservoir) habitat has been significantly increased in area, from 41,450 ha to 110,800 ha. However, the diversity and type of lentic habitats has been altered, with 12 lakes being replaced by 12 reservoirs. Changes in littoral habitats vary from reservoir to reservoir. Littoral habitats within storage reservoirs are subjected to larger variations in water levels than natural lakes, while most of the run of the river reservoirs and regulated Kootenay Lake, have water level stability similar to or more than that of comparable natural lakes in the region, including some lakes that were inundated. A risk assessment, based on losses as a proportion of similar terrestrial habitats available in the Columbia Basin, demonstrated that across the various dam units, loss-induced risks were: very high for very wet forests (4780 ha, 19%), wetlands (7700 ha, 26%) and gravel bars (3660 ha, 53%); high for wet forests (28,760 ha, 10%), cottonwoods (5530 ha, 21%) and shallow water/ponds (1070 ha, 31%); and medium high for intermediate forests (15,660 ha, 2%). Losses of lake and river shoreline habitats were rated high for Kinbasket (980 km) and Arrow (680 km) reservoirs, while Revelstoke (350 km), Duncan (200 km) and Koocanusa (310 km) were rated medium high. Within the drawdown zones of some reservoirs there have been new ecosystems established, especially in the Revelstoke Reach of the Arrow Reservoir. Even though some of these simplified communities produce large quantities of vegetation, their value for higher trophic levels is limited.

Fish species impact assessments described a wide range of impacts, although the significance of particular impacts on individual species varied considerably depending on the life history of the species. Impacts were assessed in detail for 5 fish species, and to a lesser extent for 19 other species. The major impacts reported include loss of riverine habitat affecting some stage of the life history (e.g., kokanee, rainbow trout, bull trout, sculpins, dace, minnows, suckers), nutrient losses (e.g., kokanee, piscivorous rainbow trout, bull trout, sculpins, chubs), changes in flow regimes (e.g., white sturgeon), changes in water quality/turbidity (e.g., white sturgeon, rainbow trout, kokanee, mountain whitefish, sculpins), habitat/population fragmentation (e.g., white sturgeon, bull trout, rainbow trout), and entrainment (e.g., kokanee). In contrast, species that were able to take advantage of the extensive increases in lentic habitat, may have benefited from reservoir establishment in some situations (e.g., kokanee, burbot, lake chub, bull trout).

Wildlife impacts were evaluated for 269 vertebrate species using habitat loss information and species-habitat associations. Sixty-four Priority 1 species including: 3 amphibians, 1 reptile, 45 birds and 15 mammals had high habitat impacts, and agency emphasis for conservation and/or management. Forty-six Priority 2 species including 38 birds and 8 mammals had high habitat impacts, but were low agency conservation or management priority. Species with the highest habitat impacts were wetland and riparian specialists such as amphibians, waterbirds, waders, songbirds, bats and aerial insectivores. Overall species impacts mirrored substantial habitat losses, particularly in Kinbasket, Arrow and Duncan dam units.

In addition to direct habitat and species impacts, the dams have also had significant impacts on ecological functions and processes. These include altered annual hydrologic regimes and floodplain processes, as well as disrupted biological processes such as natural disturbance regimes, trophic dynamics and nutrient cycling. The dams and reservoirs have impacted functions for individual species and populations, including seasonal migrations, genetic exchange, predator/prey relationships, reproduction and dispersal. These impacts can extend into non-impacted watershed units, especially those downstream of dams and reservoirs (e.g., Kootenay Lake, lower Columbia River).

Potential compensation opportunities identified in the series of impact assessment reports are summarized. Compensation options included various projects for both aquatic and terrestrial ecosystem restoration and creation (e.g., stream channel works, lake fertilization, stand structure treatments, restoration of connectivity); habitat securement, stewardship and management (mainly off-site); and species-specific projects for inventory, research, predator/prey manipulation and artificial population/habitat enhancement (e.g., spawning channels, hatchery production, captive rearing, re-introductions, nest boxes). Long-term investments in these activities will contribute to meeting the water license conditions that gave rise to the FWCP:CB, and provide valuable support to maintaining the biodiversity of the Columbia Basin.

March. 2011

G. Utzig and D. Schmidt
Other authors emphasize the need to address primary limiting factors when attempting to maintain productive capacity, rather than having a strict focus on habitat loss. For example, replacement of lost spawning habitat will result in minimal population increase if factors later in the life history are more limiting. They also note that compensation approaches should have a goal of maintaining the habitat required to provide broad life history diversity, and recognize that evaluation of project success should be based on quantified ecological improvement rather than easily measured outputs such as funds spent or the number of fish stocked.

Clearly, re-creating the total amount and composition of habitats lost within the footprint of the reservoirs is not a practical consideration as this would require removal of the dams themselves. In practice, where impacts are extensive and varied, compensation approaches also need to be multifaceted and acknowledge that NNL may not be achievable.

Within some reservoir footprints, it is potentially feasible to re-create functioning fish and wildlife habitats to a fraction of pre-dam distribution (e.g., pelagic habitats, non forested wetlands); however, most opportunities for compensation (e.g., habitat restoration) occur 'off-site' or in 'unaffected-dam-units'. In addition, opportunities for habitat protection through acquisition, covenant, or stewardship agreement (e.g., preservation), do not neatly fit into the concept of NNL but arguably provide the greatest environmental benefit into the future. In concert with other compensatory approaches, preservation is a recognized tool and is considered here alongside the generally accepted compensation options of habitat conversion/creation and restoration.

Knowledge of species, ecosystems, and their functions continues to expand as new information is gathered through inventory, research, and new analysis techniques. Where the majority of the land base is Crown owned and managed (as is the case in the Columbia Basin), provision of new information supporting effective protection and/or restoration of remaining highly-impacted habitats can also be considered a viable compensation option. For example, 'Integrated Management Planning' information that assists designation of Protected Areas, Watershed and Riparian Reserves, Old Growth Management Areas, Wildlife Habitat Areas, and Ungulate Winter Ranges can provide incremental benefit to species and ecosystems affected by footprint impacts.

On-site compensation options for some lake habitats and fish species are present, but for stream and terrestrial habitats and species compensation, on-site compensation options are generally limited to the upper elevations of reservoirs where water levels can allow for development of some habitat types (e.g., wet meadows, mud flats/ sand bars and limited shrub habitat). These created habitats may have severely limited seasonal function, depending on reservoir water level fluctuations. In addition, wildlife use of 'on-site' habitats requires further study to determine the conditions where these re-created habitats act as production 'sources' or 'sinks'. Forest and stream habitats cannot be developed within the reservoir footprints, so compensation opportunities for these habitats will only occur off-site or in unaffected dam units. Floating islands offer the opportunity to create additional wetland or herbaceous habitat within the dam footprints. Due to the combination of limited area, site-specific habitat types, and potential habitat function that can be achieved on-site, the majority of terrestrial and stream habitat compensation options will occur off-site.

Off-site compensation options depend heavily on the availability of low elevation habitats. In many cases, limited opportunities remain in the affected dam units, and unaffected dam units may provide some of the only remaining low elevation habitat types. Free flowing sections of the Columbia River are rare in the Basin, consequently these areas have value both as a benchmarks and potential concentration areas for fish and wildlife in remaining low elevation habitats.
Habitat Types for analysis were defined based on additional Ecosystem Types from MacKillop et al. (2008). New species/habitat associations were added to the CBDB to match species to the new Habitat Types, based on species use of habitat elements associated with the new types (e.g., coarse woody debris and hollow live trees with Wet Forests, deciduous trees and Cottonwood stands).

A Wildlife Species Impact Rating (WSIR) was calculated for each species in each dam unit it occurred, based on a summation of the Habitat Loss Risk Ratings (HLRR) for each of the Habitat Types associated with that species. The WSIR's were then combined with further information from the BC Conservation Framework, BC MoE regional management priorities for mammal species, and the list of focal species birds of significance for the Columbia Basin prepared by the Canadian Intermountain Joint Venture. Based on those combined criteria, priority ratings were determined for each resident/breeding vertebrate species in each impacted dam unit (a total of 289 species for the Columbia Basin Study Area). Priority 1 species had both high or very high impact ratings (WSIRs), as well as high priorities for management, as determined by other agencies/processes. Priority 2 species had high or very high impact ratings, but were not designated as a high priority for management by the other agencies/processes.

1.2 Vision and Principles
The FWCP's provincial vision is:

"Thriving fish and wildlife populations in watersheds that are functioning and sustainable."

While the program operates in basins and landscapes that have been significantly altered by hydro-electric development, the vision recognizes that an effective program can support the maintenance of healthy fish and wildlife populations that will meet both conservation and sustainable use objectives. Actions focussed on conserving, and where possible restoring ecosystem function, will help species be more resilient to emerging pressures such as climate change.

The program principles include:

- **Approach** - The program has a forward-looking, ecosystem-based approach that defines the desired outcomes and takes actions to restore, enhance and conserve priority species and their habitats.

- **Decision Making** - The program efficiently uses its resources and works with its partners to make informed and consensus-built decisions that enable the delivery of effective, meaningful and measurable projects that are supported by the impacted communities.

- **Geographic Scope** - Within the watersheds, basins and ranges of the populations of species affected by generation facilities owned and operated by BC Hydro.

- **Objectives** - The program defines and delivers on compensation objectives that reflect the partnership's collective goals and align with provincial and federal fish and wildlife conservation and management objectives in the areas where we work.

- **Delivery** - The program strives to be a high performing organization with skilled and motivated staff and partners delivering efficient, effective and accountable projects.

1.3 Partners and Program Delivery
The program is a partnership between BC Hydro, the BC Ministry of Environment, Fisheries and Oceans Canada, First Nations and public stakeholders. The goal is to have engagement and participation of all the partners in priority setting, approval, review and delivery of the program.
FISH AND WILDLIFE COMPENSATION PROGRAM

COLUMBIA BASIN PLAN DRAFT

June 2012
BC Provincial Government

The BC Ministry of Environment (MOE) and BC Ministry of Forests, Lands and Natural Resource Operations (FLNRO) manage and deliver a wide range of programs and services that support the Province’s environmental and economic goals. The Ministry encourages environmental stewardship, develops innovative partnerships, engages First Nations, stakeholders and the public and actively promotes the sustainable use of British Columbia’s environmental resources. Within this broader context, the Ministry has a number of responsibilities that are particularly relevant to the development and implementation of actions under the FWCP including:

- Management and conservation of the province’s biodiversity;
- Protection of fish, wildlife, species-at-risk and their habitats;
- Protection and restoration of BC’s watersheds; and,
- Provision and management of fish and wildlife-based recreation.

A number of policies and plans guide the Ministry in delivering on these goals and objectives. The Conservation Framework is British Columbia’s approach for maintaining the rich biodiversity of the province, providing a set of science-based tools and prioritized actions for conserving species and ecosystems in B.C. Program Plans for Freshwater Fisheries, Wildlife and Ecosystems articulate a clear set of strategies supported by actions to achieve both conservation-based outcomes and the provision of recreational opportunity. Recovery Strategies and Management Plans continue to be developed to guide the maintenance, recovery and/or use of specific species and ecosystems. These plans may include specific performance measures and targets.

Fisheries and Oceans Canada

Under the federal Fisheries Act, DFO is the primary agency responsible for conserving and managing Canada’s fisheries, including pacific salmon. It does so through management and monitoring of fisheries, protection of fish habitat, and pollution prevention. The Policy for the Management of Fish Habitat (1986) has an overall objective of ‘net gain’ of fish habitat and helps guide the implementation of fish habitat protection through collaboration with relevant provincial agencies. The Species at Risk Act mandates protection of geographically and genetically distinct populations. The principle goal of the Wild Salmon Policy is “to restore and maintain healthy and diverse salmon populations and their habitats for the benefit and enjoyment of the people of Canada in perpetuity”. This is achieved through

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3 http://www.env.gov.bc.ca/conservationframework/
4 http://www.env.gov.bc.ca/esd/
FISH AND WILDLIFE COMPENSATION PROGRAM

COLUMBIA BASIN

SPECIES OF INTEREST ACTION PLAN

DRAFT

June 2012
2.3. Limiting Factors

Factors limiting the abundance and distribution of aquatic and terrestrial species are related to three broad categories:

- **Habitat Extent**
  The carrying capacity of habitat for any species is ultimately determined by the extent of suitable habitat. As mentioned above, inundation and other stressors have altered the extent of habitats available. Compensating for this loss requires either the creation of new habitat or treatments that increase the carrying capacity of remaining habitat.

- **Distribution**
  Connectivity among habitats is important for dispersal of fish, plants and animals and for seasonal movements of some species. Populations in suitable but isolated habitats are often at higher risk of extirpation because immigration and emigration are disrupted, making these populations more susceptible to stochastic events. Management actions that can address habitat fragmentation and barriers include re-establishing connectivity where practical, and/or transplanting individuals into unoccupied or under-occupied habitats.

- **Productivity**
  The productivity of an ecosystem is defined as its ability to grow or yield native plants and animals. Even where the extent and distribution of habitats is relatively intact, the productivity of ecosystems can be eroded by a variety of pressures such as invasive species, nutrient and sediment loading, soil erosion, changes in drainage patterns, as well as forest harvesting, livestock grazing and other extractive activities. Addressing these factors can increase the productivity of habitats in general and can provide more suitable habitat for native species.

In addition, specific habitat features can limit the distribution and abundance of species; for example, spawning beds or nest cavities. Projects designed to increase the availability of limiting habitat features can increase the productivity of habitats for specific species.

2.4. Trends and Knowledge Status

Long-term monitoring data are generally unavailable for aquatic and terrestrial species in the Columbia Basin. As a result, our knowledge of pre-dam populations is limited to anecdotal accounts or inferences made from habitat impacts. Trend information for some species (e.g., ungulate populations, recreational fish species) has become more available over the past 25 years. More recently, a focus on threatened and endangered wildlife has improved our knowledge of the distribution and abundance of these species; however, there remain significant gaps.

**Actions:**

Actions are management activities, plans or policies for achieving the objectives.

**Objectives:**

Objectives are the “ends” or the outcomes we ultimately care about. Actions are the “means,” or the things we do to achieve them. This report focuses on describing the actions required to achieve the objectives in relation to species of interest.

3.2. Objectives, Measures and Targets

There are two FWCP objectives for species of interest in the Columbia Basin.

**Objective 1** – Maintain or improve the status of species of interest in the Columbia Basin.

**Sub-objective 1:** Improve the distribution and abundance of recovery and focal species.

**Rationale** — Expanding/recovering populations and/or expanding the range species of interest that are found within the Columbia Basin is considered a high priority.
FISH AND WILDLIFE COMPENSATION PROGRAM

COLUMBIA BASIN

RIPARIAN AND WETLANDS ACTION PLAN DRAFT

June 2012
Targets: Targets are the value of the performance measure that indicates the attainment of a desired condition.

Actions: Actions are management activities, plans or policies for achieving the objectives.

Objectives are the "ends" or the outcomes we ultimately care about. Actions are the "means," or the things we do to achieve them. This report focuses on describing the actions required to achieve the objectives in relation to riparian and wetland species and habitats. Complementary actions may also be identified in the separate Species of Interest Action Plan.

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

- **Category 1**
  - Natural riparian or wetland habitat
  - Largely intact and functioning ecosystems with natural disturbances sufficient to maintain subclimax communities and processes characteristic of wetlands and riparian ecosystems.

- **Category 2**
  - Disclimax or degraded wetland or riparian habitat
  - Formerly natural wetland or riparian ecosystems that have lost most of their natural disturbance regime and are no longer functioning effectively as wetland or riparian habitat. These areas are candidates for restoration to Category 1 or 3 habitats.

- **Category 3**
  - Managed or created riparian or wetland habitat
  - Ecosystems resulting from water impoundments, diversions or other artificial disturbances that require active management to maintain productivity and function.

The categories contrast different levels of ecosystem function that require different management approaches.

### 3.2. Objectives, Measures and Targets

The entire Columbia Basin shares common objectives, sub-objectives and performance measures; however, targets are stratified by focal areas.

**Objective 1 – Maintain productive and diverse ecosystems.**

**Sub-objective 1:** Secure remaining Category 1 riparian and wetland habitat within the basin impacts area.

**Rationale:** Conversion to other land uses is an ongoing threat to riparian and wetland habitat, and securing remaining habitat to prevent loss is a high priority. Habitat is considered "secure" if it is protected from conversion to other land uses (e.g., by purchasing the land or negotiating a covenant or stewardship agreement).

**Performance measure:** Proportion of riparian and wetland habitat secured within 20 years.
ENVIRONMENTAL STRATEGIC PLAN
2009-2012

REVIEW & UPDATE 2013 - ?
LINKAGE TO THE COLUMBIA BASIN
1. DAM FOOTPRINT IMPACTS SUMMARY
2. COLUMBIA BASIN PLAN AND 6 ACTION PLANS
   - RIPARIAN / WETLANDS
   - LARGE LAKES  SMALL LAKES
   - UPLAND / DRYLAND
   - STREAMS  SPECIES OF INTEREST
3. MINISTRY OF ENVIRONMENT PROGRAM PLANS
   - WILDLIFE  FRESHWATER FISHERIES
   - ECOSYSTEMS
   - INTEGRATED PARTNERSHIPS

CBT  FWCP  MOE  DFO
CPC  BC HYDRO

W W W . C B T . O R G
Goal 2 - Encourage education and awareness for all generations about Basin ecosystems and associated human interactions.

**Objectives**

- Provide access to environmental information.
- Provide resources to projects, programs and collaborative efforts, promoting effective approaches to education and awareness.
- Generate a better understanding of Basin well-being and current environmental conditions needing action.

**Desired Outcomes**

- Broad-based education and awareness about Basin ecosystems and human interactions with the systems is growing.
- Awareness of particular environmental conditions needing attention is increasing.
- Mechanisms are in place to improve access to environmental information and support effective educational and awareness efforts in the Basin.

**Planned Activities**

- Provide funding for community-based environmental education and awareness projects.
- Support approaches to enhance environmental awareness and understanding of community groups, individuals and governments and disseminate information that will assist them in action.
- Support education and awareness programs in the Basin and explore options to further support environmental educators in the Basin.
- Collaborate to explore and promote effective environmental education and awareness approaches, particularly adult-focused.
- Ensure broad communication and understanding of environmental conditions needing attention, as identified through research, other activities, programs or initiatives.

Goal 3 – Support positive environmental action within the Basin, leading where appropriate.

**Objectives**

- Provide technical support and expertise for community environmental actions.
- Provide resources to community projects which address ecological priorities.
- Implement priority conservation efforts.

**Desired Outcomes**

- Technically sound local and regional community projects are being supported.
- An increasing area of Basin ecosystems which are at risk are managed for conservation values.
- Actions are expanding to address the spectrum of ecological priorities.
Environment Strategic Plan
2014 – 2019

Goals & Objectives

Columbia Basin trust
cbt.org
Goal 2: Ecosystems

Strengthen Basin-wide and local efforts to maintain and enhance aquatic and terrestrial ecosystem function and native biodiversity.

Why focus on ecosystems?

Ecosystems must be able to function and adapt so that the diversity of life in the Basin will endure and essential goods and services provided by ecosystems continue to support a high quality of life for Basin residents. In an era when changing temperatures and precipitation patterns have begun to impact human communities and disrupt the natural habitats of many species already threatened, maintaining and enhancing ecosystem functionality and biodiversity is critically important. Through collaboration, partnerships and project funding, the Trust’s activities will support efforts to ensure the region’s native biodiversity is able to adapt and thrive over time.

Objectives

1. Strengthen efforts to maintain and enhance ecosystems and species of conservation concern.

Activities

• Continue partnering with community-based and government organizations to enhance and conserve ecosystems of conservation concern at local and regional scales through research and support for on-the-ground projects.

• Support projects that contribute to the enhancement and conservation of fish, wildlife and plant species that are of conservation concern.

Desired Outcomes

• Project funding and collaboration result in conservation and enhancement of ecosystems of conservation concern.

2. Contribute to scientifically sound land conservation and stewardship on private lands.

Activities

• Continue contributing to land securements for conservation purposes.

• Continue supporting partners to develop and implement stewardship plans for conservation securements.

Desired Outcomes

• Increased amount of land with high conservation value and public benefit is protected through a variety of means to ensure current and future generations can appreciate the Basin’s biological diversity and natural heritage.

3. Help reduce the threat of invasive species to terrestrial and aquatic ecosystems.

Activities

• Support collaboration and on-the-ground projects that prevent, reduce and monitor the establishment and spread of current and new invasive species.

• Improve Basin residents’ understanding of how native biodiversity is impacted by invasive species.

Desired Outcomes

• More groups work together to address invasive species. Further establishment of invasive species is prevented or reduced.

• Basin residents have increased awareness and understanding of the importance of native biodiversity and the threats posed by invasive species.
APPENDICES

Appendix Statement of Principles for the Columbia River Roundtable

The Columbia River Roundtable includes citizens, businesses, and other organizations in Canada and the United States who support an updated U.S.-Canada Columbia River Treaty. An updated Treaty will:

1. Make protection and restoration of the ecological health and ecosystem function of the Columbia River and its tributaries an explicit and equal Treaty purpose;
2. Create resilience to climate change and other environmental threats within the Columbia watershed by restoring ecosystem functions and enhancing ecological health;
3. Reduce harmful impacts of dams and reservoirs;
4. Restore salmon and other anadromous fish throughout their historic habitats, and protect and restore other native fish and wildlife and their habitats;
5. Honour and support Columbia River First Nations and Tribes as leaders in bringing ecosystem function and salmon restoration into the Treaty; and,
6. Be transparent and inclusive, so future basin governance and Treaty arrangements meaningfully engage all affected people.
Biodiversity lost to flooding - low elevation & old growth forests, grassland ecosystems & plant communities, complex aquatic / floodplain ecosystems, riparian & wetland zones and sophisticated fish & wildlife habitats.

26 miles or 45 kms of rock, sand, gravel and stumps
In 1964 the United States and Canada entered into the Columbia River Treaty. This agreement still governs the management of the river’s water and dams today. During the treaty negotiations, the voices of local communities and indigenous peoples were excluded. Not surprisingly the treaty has only two purposes: hydropower production and flood control management. Nothing in the treaty promotes the return of salmon or health of the river.

We find ourselves now with a once-in-a-generation opportunity to right this historic wrong. The window to renegotiate the 50-year-old treaty opened in 2014, providing the region a chance to modernize and change the priorities by which the Columbia River is managed.

One priority that many voices are calling for is the addition of ecosystem function as a third purpose of a modernized treaty. The Ethics & Treaty Project was created to promote the idea that the two nations must base their renegotiation decisions on the ethical principles of stewardship, justice, and fostering the common good—not only for humans, but also for the river itself and all the species that depend on it. In so doing, the project seeks to promote environmental justice, improve the health of the Columbia River, and restore fish passage to the Upper Columbia River and other ancestral spawning waters now blocked by dams.

Working for river stewardship in a time of climate change.
In 2001, twelve Roman Catholic Bishops of the international Columbia River watershed wrote the Columbia River Pastoral Letter. The letter invited people to explore the implications of human stewardship of creation and to effect a spiritual, social and ecological transformation of the watershed. In May 2014, Gonzaga University hosted the conference “Ethics & the Treaty: Righting Historic Wrongs.” The conference, while acknowledging benefits from the dams, provided a forum for religious and indigenous leaders to discuss the damage done by the Columbia River’s dam-building era. From this conference issued the Declaration on Ethics & Modernizing the Columbia River Treaty, which hundreds of people have now signed.

On September 23, 2014, the Declaration, the Pastoral Letter, and a letter signed by 21 religious and indigenous leaders from throughout the Columbia River basin was sent to President Obama and Prime Minister Harper. These religious and indigenous leaders admonished the two nations to renegotiate the treaty consistent with the values and ethics espoused by the Declaration and Pastoral Letter and to establish a water ethic as a foundation for resolving international water conflicts.

**Kettle Falls**, an incredibly rich salmon fishing spot and gathering place for indigenous people since time immemorial, was flooded by Grand Coulee Dam.

In June 1940, an estimated 8,000 to 10,000 people mourned the falls at a “Ceremony of Tears” organized by the Colville Confederate Tribes and attended by representatives of the Yakama, Spokane, Nez Perce, Salish, Kootenai, Blackfeet, Coeur d’Alene, Tulalip, Pend d’Oreille, and other tribes.

**Grand Coulee Dam**, built by the United States with the approval of Canada, blocked the return of salmon to the upper Columbia and permanently flooded Kettle Falls.

**Hydropower** and flood control are the two purposes of the 50-year-old Columbia River Treaty. In a time of climate change, a third and coequal purpose needs to be added: ecosystem function.

**ETHICS & TREATY PROJECT**
is sponsored jointly by the Center for Environmental Law & Policy and Sierra Club, working with tribes and First Nations with natural resource rights and management authorities in the Columbia River Basin.

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[http://celp.org/ethics-treaty-project](http://celp.org/ethics-treaty-project)
The Governments of the United States of America and Canada implemented the Columbia River Treaty in 1964 (Treaty) and agreed to jointly govern water resources to promote economic growth, wealth, and happiness for the citizens of the two nations. For fifty years the original treaty has only included flood control and hydroelectric power generation as international management purposes of the Columbia River. The consideration to renegotiate the Treaty currently underway is driven by the looming expiration of some flood control provisions, the ten-year time frame required for either party to withdraw from the treaty, and the societal desire to restore the Columbia River to health.

What the Treaty did not mention in 1964 is as significant today as what it did mention: the recognized and reserved rights and management authorities of the Columbia Basin tribes in the U.S. and the First Nations in Canada were ignored in the Treaty. The trust, treaty and honour obligations of the U.S. and Canada to ensure healthy, sustainable populations of salmon, sturgeon, lamprey, bull trout and other native fish and wildlife, their habitats and other cultural resources within the Columbia River Basin were not provided for in the Treaty. The tribes and First Nations were not even consulted during its negotiation.

In the U.S., the Northwest Power Act of 1980 makes fish and wildlife and power production equal obligations in running the federal system of dams and calls for protection of tribal rights. Those statutory obligations combined with trust and treaty responsibilities of the U.S. to the tribes require reconsideration of the premises of the 1964 treaty.

Today we recognize fish, wildlife, riparian habitat conditions, water quality, and water temperature as vital issues for the Treaty. All of these omissions from the current Treaty are wrong from our 21st century perspective. Renegotiation of the Treaty provides an opportunity to ensure that these concerns become additional fundamentals of our regional water management.

Climate change, not recognized as an emerging problem in 1964, also needs to be taken into account for a modernized treaty to be useful in the new century. Climate change projections show a future with hotter and drier conditions east of the Cascade Mountains, reduced snowpack, reduced summer river flows, increased rainfall west of the Cascades, and in general a new regime that will challenge the survival of native species adapted for present habitat conditions. Climate change will impact the entire region irrespective of national borders and any treaty renewal needs to help shape and implement joint approaches for responsibly addressing this issue and planning for resiliency and adaptation.

From an ethical perspective, the Columbia River Pastoral Letter, The Columbia River Watershed: Caring for Creation and the Common Good, provides a template for socially and scientifically informed ethical norms that should be considered in the renegotiation process.

Considering the Columbia Basin as a Common Good means that the basin constitutes a shared international habitat that is an inclusive and integrated human-ecological system, in which our stewardship responsibilities and our moral and legal obligations to native people are actively upheld. This leads to the following principles for modernizing the Treaty:

- Respect the rights, dignity and traditions of the Columbia Basin tribes and First Nations by including them in the implementation and management of the Treaty.
- Include healthy ecosystem function as an equal purpose of the Treaty.
- Achieve balance among river uses for hydroelectric power production, coordinated flood risk management, and healthy waters and flows that provide for abundant and sustainable native fish and wildlife populations.
- Develop flow and water management operations to help people, native species, and entire ecosystems withstand climate change.
- Provide for ecosystem management of the region while protecting other river uses, including tribal commercial, and tribal ceremonial and subsistence activities.
- Engage local communities in a meaningful manner that is transparent and inclusive during renegotiation and future management of the Treaty.
- Address economic and environmental justice for the poor along with other aspects of economic development.
- Restore anadromous and resident fish passage to all historical locations throughout the Columbia River basin, including Chief Joseph, Grand Coulee, Hugh Keenleyside, Brilliant, and Waneta dams.
This is a map produced by the Columbia River Inter-Tribal Fish Commission. It is meant for informational and display purposes only and was created with the best data available at the time of production. It does not represent any legal boundaries or position.

Tribal Nations in the United States*
1. Burns Paiute Tribe
2. Coeur d'Alene Tribe
3. Confederated Salish and Kootenai Tribes of the Flathead Nation
4. Confederated Tribes and Bands of the Wenatchee Nation
5. Confederated Tribes of the Colville Reservation
6. Confederated Tribes of the Umatilla Indian Reservation
7. Confederated Tribes of the Warm Springs Reservation of Oregon
8. Cowlitz Indian Tribe
9. Ft. McDermitt Paiute-Shoshone Tribes
10. Kalapuya Tribe of Indians
11. Kootenai Tribe of Idaho
12. Nez Perce Tribe
15. Spokane Tribe of Indians

First Nations in Canada
Inside the Columbia Basin
16. Tsilhqot'in (Tsilhqot'in Nation)
17. Ktunaxa (Ktunaxa Nation)
18. Secwepemc (Secwepemc Nation)
19. Colville (Colville Tribe)
20. Shuswap (Shuswap Nation)

Outside the Columbia Basin with Assured Interests
21. Ktunaxa (Tsimshian) (Tsimshian Nation)
22. Secwepemc (Kwaw-kwaw-kwaw Nation)
23. Qw'utsun (Kwaw-kwaw-kwaw Nation)

Columbia River Treaty