TRANSBOUNDARY COOPERATION IN THE INTERNATIONAL COLUMBIA RIVER BASIN:

A Preliminary Assessment of Existing Arrangements and Future Prospects

Prepared for

The Columbia Basin Trust
Northwest Power & Conservation Council

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In Partnership with

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"In the end, we will conserve only what we love.
We will love only what we understand.
We will understand only what we are taught."

Baba Dioum, New Delhi, 1968

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ABSTRACT

This report is an assessment of the current state of transboundary cooperation between the United States and Canada within the international Columbia River basin on issues broadly related to water resource management. Current initiatives were identified and categorized into several management categories including: ecosystem function, fish passage & restoration, climate change, invasive species and/or toxics management, energy, and international river governance. Interviews were then conducted with 34 natural resource managers throughout the region on their work, specifically addressing areas where they are, and are not, collaborating cross-border at this time. These interviews revealed that, while there is a great deal of work currently being done to address these issues collaboratively, the work is largely fragmented and limited to sub-basin or regional activities. Basin-wide cooperation, outside of the relevant international treaties, appears virtually non-existent at this time. Managers working on climate change adaptation and mitigation in the Crown of the Continent region are disconnected from those working on the lower Snake or in Lake Roosevelt. Water quality monitoring activities in the lower Columbia River basin are not connected to those in the upper basin.

It is increasingly understood that complex natural resource issues cannot be successfully addressed in isolation. In order to strengthen and expand transboundary cooperation at the basin level, this report identifies several existing initiatives that could be expanded upon, as well as opportunities to make connections where few currently exist. These recommendations are directly based on feedback received from the individuals interviewed for this project, and offer opportunities, and challenges, for future cross-border cooperation in the Columbia River basin.

1.0 INTRODUCTION

1.1 Objectives of this Project

The Columbia River is an international river basin shared by Canada and the United States. Several initiatives have emerged over the years to facilitate transboundary administration and cooperation on a wide variety of water management, and related, natural resource issues. The objectives of this assessment are to highlight these existing transboundary arrangements and to offer some insight on opportunities for future transboundary cooperation between these riparian neighbors.

This assessment flows in part from participant requests at the October 2014 International Columbia River conference entitled *Learning from Our Past to Shape Our Future*, co-hosted by the Northwest Power & Conservation Council ("Council") and the Columbia Basin Trust ("Trust"). On the final day of the conference, participants specifically challenged the Trust and Council to bring together individuals and organizations working across the international border to share data, information, funding and collaborate on ways to effectively and efficiently address complex regional environmental and energy issues, as well as foster a greater sense of shared basin identity[1].

The international Columbia River basin contains a diverse set of stakeholders working at many different levels on a variety of regional issues such as improving ecosystem functioning, anadromous fish reintroduction, invasive species mitigation and prevention, sustainable energy production, and Tribal treaty rights protection. Outside of the Universities Consortium on Columbia River Governance (UCCRG), there currently appears to be few centralized databases or facilitated transboundary forums for managers to connect, meet or discuss their work and visions for the future of the basin. The Council and Trust may be open to facilitating such a forum, but first need a clearer picture of what cross-border collaboration already exists. This assessment is a first attempt at understanding the current transboundary management landscape. In addition to documenting who is doing what, where and with whom in the basin, this report also identifies the most compelling needs, interests and priorities for these initiatives so that any efforts to increase cooperation are seen as useful and elicit wide participation. The final objective of this project is to take the information gathered from interviews and identify potential next steps for the Council and Trust, and others, in their role as transboundary cooperation facilitators.

[1] For more information on the conference, and the outcomes mentioned here, see *The Columbia River Basin: Learning From Our Past to Shape Our Future, 2014 Conference Summary*

1.2 Methods

This report identifies a number of transboundary initiatives and categorizes them into broad issue areas (see Appendices 4.1 & 4.2). Telephone interviews were conducted with contacts from as many of the initiatives as were willing to participate and available during July 2015.

Given the limited objectives of this report, as well as the brief time frame for completion, we caution that it represents only a snapshot of the current transboundary cooperation landscape and should not be viewed as an exhaustive list of entities or a complete rendering of all of the transboundary work being done. Cross-border collaboration within the basin is a dynamic process, one that is constantly in flux. This narrative report is not intended to provide a full account of all the ties that bind Columbia basin communities together over their shared resources. Focusing solely, as this report does, on the legal and institutional arrangements in place does not take into account the complex social processes or cultural, spiritual, and economic ties that exist between transboundary communities. Instead, this report solicits input from managers working within each of the broad issue areas in order to identify and assess the overall level of institutionalized cross-border cooperation that exists at this time.

Identifying Initiatives

The international Columbia River basin encompasses an area of 259,000 square miles, approximately the size of France, and has ten major tributaries: the Kootenai/y, Okanagan, Wenatchee, Spokane, Yakima, Snake, Deschutes, Willamette, Cowlitz, and Lewis[2]. The river's headwaters originate in southeastern British Columbia, from which the mainstem and its tributaries flow through seven U.S. states before finally emptying into the Pacific Ocean at Astoria, Oregon. We used the following three criteria to help identify current transboundary initiatives:

- Operating within the international Columbia River basin
- Operating on both sides of the 49th Parallel
- Includes water and/or related natural resources

The compiled list includes 46 transboundary initiatives and represents an initial attempt at identifying the dozens of entities currently working on cross-border issues within the basin. This list, while not inclusive of every transboundary organization, is nonetheless representative of the type and level of institutionalized cooperation occurring at this time.

[2] Bill Lang. (n.d.). "Columbia River." Center for Columbia River History. Retrieved from http://www.ccrh.org/river/history.htm

The initiatives critically reviewed in this report vary in terms of formality as well as composition. Some are highly formal, such as the bilateral agreements between British Columbia and its neighboring states, while others simply consist of longstanding relationships that, over time, have generated shared projects and agendas, such collaborations between various First Nations in Canada and tribes in the U.S.

The primary focus of this report is on regional, state, provincial, local and tribal cooperation, outside of applicable international agreements. However, the current status of one such agreement, the Columbia River Treaty, was raised repeatedly during the interview process. More specifically, there is intense interest as to whether Canada and the United States may decide to adjust the current Treaty to include ecosystem function, fish passage, and/or Tribal and First Nations rights and responsibilities.

Categorizing Initiatives

The second stage of this assessment involved breaking down the list of identified transboundary initiatives into categories based on issue area. These categories are derived from the working groups used during the 2014 International Columbia River conference in Spokane. They include:

- Ecosystem function
- Fish passage and restoration
- Invasive species and/or toxics
- Climate change
- Energy
- Transboundary river governance

In light of the potential adjustment of the Columbia River Treaty, as well as future management of the basin in general, participants at the 2014 conference were asked to reflect on these issues, discuss their current status, and determine what changes, if any, they would make to the current management system. Given their continued relevance, this report uses the same classifications to categorize and assess the transboundary initiatives.

One note on the energy category. Like the transboundary river governance entities, many of the energy entities do not collaborate outside of their formal obligations under the Columbia River Treaty. Hydropower production is a very important transboundary issue, but for the purposes of this report on assessing and identifying areas that could benefit from greater cross-border cooperation, we decided not to focus on this highly regulated issue area, beyond identifying the relevant energy initiatives (see Appendix 4.2).

Interviews

The third and most important step involved conducting phone interviews with appropriate contacts from several initiatives within each category (for names and titles of the individuals who participated in these interviews, see Appendix 4.4). In addition, this report includes interviews with professionals who are not involved in any of the 46 initiatives, but who cooperate with international counterparts outside of a formal entity. Each interviewee was asked the same seven questions in order to develop a more holistic understanding of who is doing what, where, and with whom, as well as what challenges and successes they have had in their transboundary collaborations (interview template is in Appendix 4.3).

Interviews ran from July 1- 31, 2015, primarily by phone, but a few were also conducted via emailed questionnaires for those who were willing to participate but did not have time for a phone interview.

- 21 out of the 46 identified initiatives are represented by interviewees in this report (These are the participating initiatives, highlighted in Appendix 4.1).
- 34 interviews were completed in total
    - 21 of the interviewees are part of one or more initiative
    - 6 of the interviewees are part of ongoing cross-border cooperation outside of one of the 46 initiatives identified
    - 7 interviewees are not working cross-border at this time. This is primarily due to restrictions in their professional mandates or a lack of funding and staff to coordinate such work.

The composition of interviews includes individuals participating in entities from all of the categories, except for international river governance. There is also a great deal of overlap between categories. For example, several of the people included in this report who manage ecosystem function issues also work on invasive species and/or salmonid reintroduction and/or climate change. For the sake of clarity, we chose discrete categories for each entity, but also stress that there is great deal of overlap between them.

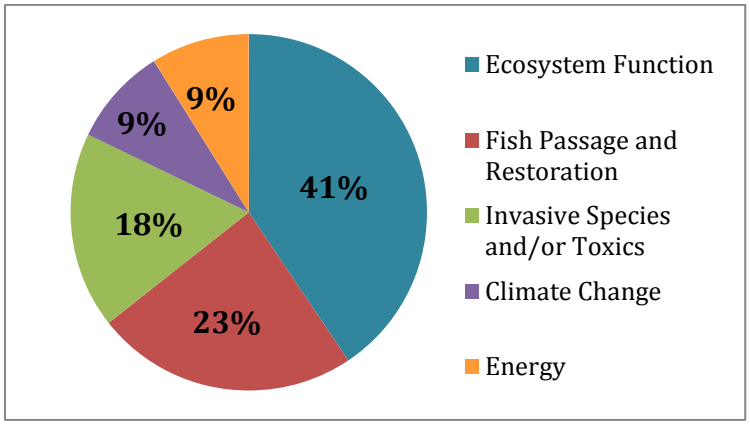

Figure 1: Interview Composition, by issue area

2.0 KEY FINDINGS

2.1 Overview of Transboundary Initiatives

In assessing the current state of transboundary cooperation within the international Columbia basin, it became clear that, while there is a great deal of work being done cross-border, the work is fragmented and, at present, there are a limited number of truly basin-wide initiatives. Furthermore, the issue areas identified in this report are not addressed equally; some areas have received more attention and funding than others. For example, managers working on invasive species in one sub-section of the basin are often disconnected from their counterparts in other sub-sections, and there are no basin-wide ecosystem health indicators in place to help managers assess, administer, restore and conserve critical habitat. These gaps represent challenges and opportunities for the creation of stronger cross-border cooperation around issues that cannot effectively be addressed in isolation. Efforts to improve ecosystem function in one portion of the basin may not be sufficient to address the needs of migrating salmonids if efforts in other areas are not equally robust. A more coordinated management plan is required if there is to be sustained progress. Other areas, such as landscape-level conservation planning, have stronger coordination in place in some portions of the basin but could be expanded to benefit the entire region. In this section, the findings are summarized by issue area, first by general theme, then in greater detail with examples of where cooperation currently exists, and where it is lacking.

Ecosystem Function

A majority of the transboundary initiatives identified in this report address the broad topic of "ecosystem function." In general, these are initiatives working towards the overall health of the river basin ecosystem or its sub-basins. Activities include terrestrial and aquatic habitat conservation and restoration, water and air quality improvement, toxic pollution mitigation, as well as wildlife conservation and management. Many of the transboundary initiatives dealing with ecosystem function are large in scale and formal in nature, either between federal agencies or between provinces and states, and often take the form of an agreement or memorandum of understanding (MOU). There are also a number of initiatives overseeing a smaller geographic scale, such as a specific stream, lake, or geographic landscape. These are generally less formal in the sense that they do not possess legally binding regulations and do not have the authority to make key decisions regarding resource management. They often act as forums for dialogue, bringing stakeholders together from across the basin to discuss common concerns, and educate the public about ecosystem health.

Fish Passage and Restoration

Restoring anadromous salmon to the blocked areas of the Columbia, as well as broader fish management activities throughout the basin, make up the second largest number of transboundary initiatives identified in this report. The fish species that navigate the Columbia and its tributaries are widely recognized as being vital to basin identity, culture, and livelihood. Therefore it is no surprise that work related to fish restoration and conservation makes up such a large percentage of cross-border activity. According to the Council's own report[3], over 55% of the spawning and rearing habitat once used by salmon and steelhead in the Columbia River basin is now blocked by dams lacking fish passage mechanisms. There is now great energy by many groups on both sides of the international border around restoring anadromous fish species to their traditional spawning grounds. The feasibility and desirability of restoration remains a controversial issue, however, and more will need to be done to address the remaining divides. Additional fishery issues in the basin revolve around setting biological objectives for resident species, hatchery management and interaction with wild populations, critical habitat protection, conservation of endangered and threatened species, harvest negotiations, and managing for the impact of climate change on native populations. Native species of concern include: salmon (the five Pacific salmon species plus kokanee), white sturgeon, trout (steelhead, rainbow, redband, bull, and westslope cutthroat), burbot and Pacific lamprey.

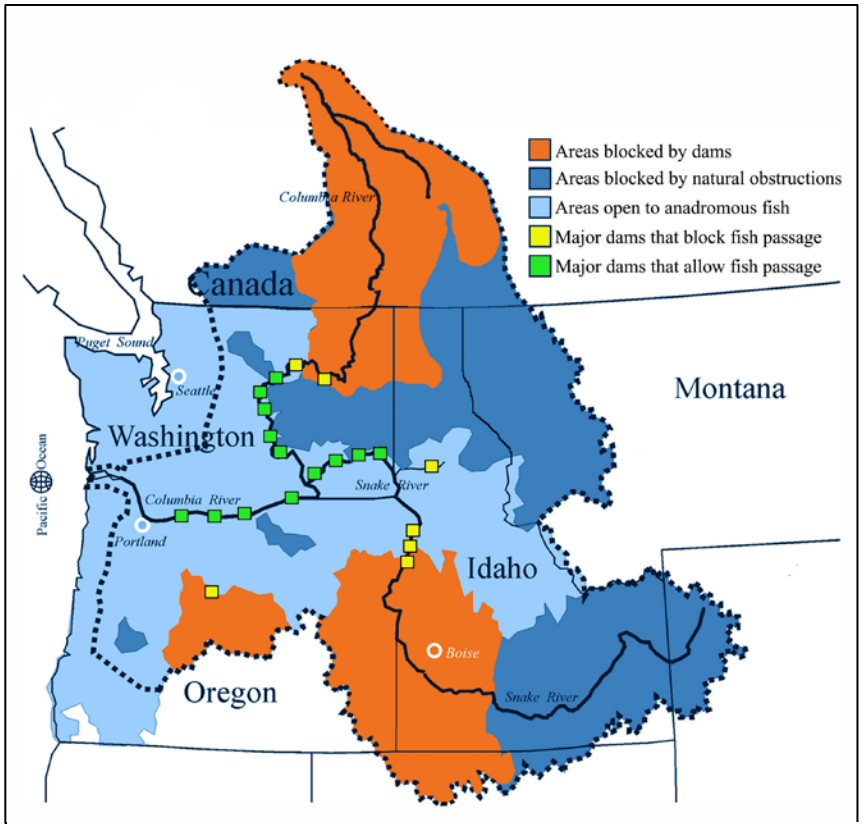

Figure 2. Areas blocked to anadromous fish in the Columbia River Basin

[3] Harrison, John. 2008. "Dams: Impacts on Salmon and Steelhead." *Columbia River History Project.* Northwest Power and Conservation Council. Retrieved from https://www.nwcouncil.org/history/DamsImpacts

Invasive Species
Invasive and non-native species management has few dedicated transboundary initiatives operating in the Columbia basin at this time. Only 2 out of the 46 identified for this report deal exclusively with invasives. Several of the other ecosystem function initiatives also address invasive species as part of a broader suite of ecosystem function activities, but this work is currently fragmented and inconsistent throughout the basin. At the same time, this is also an area where cross-border cooperation is occurring absent of a formal initiative. Many of the aquatic invasive species (AIS) coordinators in the region work on an ad hoc basis with their international counterparts to monitor and report invasive species activity as it traverses the international border.

Climate Change
The effects of climate change can arguably already be seen within the Columbia basin, making it very much a current issue. That being said, climate variability is still an emerging challenge that managers must begin to mitigate for and adapt to. Many of the transboundary initiatives currently dealing with climate change in the basin are formal partnerships between two or more federal governments, as well as multiple provinces and states. Others are part of broader ecosystem function activities being undertaken by regional stakeholder groups, researchers, and universities. Formal climate change initiatives, however, are uncommon at this point and the work being done is uneven throughout the basin.

Energy
Hydropower generation on the mainstem Columbia and its tributaries is by far the largest single source of electricity in the basin; its value to basin residents cannot be understated. Although there are a few initiatives dealing with the management of energy, all are formal agreements either between Canada and the United States or between the regional utility operators. This report does not identify any local or grass roots transboundary initiatives addressing energy production in the basin at this time.

2.2 Key Issue Areas and Examples

2.2.1 Examples of transboundary cooperation, by issue area

Each of these broad categories of activities have some cross-border cooperation already in place. This is especially true with regard to fish passage and salmon reintroduction, as they require coordination between Canada and the United States to both determine the feasibility of reintroduction as well as the eventual implementation of such a project, should it be approved. Around other issue areas, there is less institutionalized cooperation between the two countries. There are a variety of reasons for this but according to Steven Waste, Director of the USGS Columbia River Research Lab, some

managers in the United States, in their capacity as federal employees, have been instructed not to work cross-border at this time given ongoing uncertainty over the potential adjustment of the Treaty. Others see limited need for it at the moment, while some facing budget and staff constraints simply do not have time for additional collaboration efforts. That being said, nearly everyone interviewed for this report expressed a willingness and desire to work together on these issues.

Ecosystem Function

Major initiatives and organizations focusing on ecosystem function:

- Roundtable on the Crown of the Continent
- North Pacific Landscape Conservation Cooperative
- Crown Managers Partnership
- Great Northern Landscape Conservation Cooperative
- Universities Consortium on Columbia River Governance (UCCRG)
- Lake Roosevelt Forum
- The Kootenai Tribe of Idaho
- Various state and provincial partnerships (fish and wildlife managers)

With regard to comprehensive ecosystem functioning, there is extensive work being undertaken on water quality assessment, habitat restoration, connectivity and migration corridors for endangered and threatened species, adaptive management planning, and understanding the effects of climate change on drought, water temperature and wildfire patterns. Landscape-level concerns predominate this set of activities, with coordinators like Mary Sexton at the Roundtable on the Crown of the Continent and John Mankowski and his team at the North Pacific Landscape Conservation Cooperative (NPLCC) working to raise awareness about landscape-wide stressors and collaborating with their counterparts in Canada to monitor, assess and restore water quality in compromised streams and wildlife habitat. Major projects include the creation and expansion of publically available spatial data on landscape-level indicators of basin health; the creation of adaptive management plans for endangered species in response to a changing climate and continuing human development; big game restoration in Idaho and Montana; data harmonization between Canada and the U.S.; and transboundary river ecosystem restoration in the Kootenai/y River basin. In addition, there are also a few transboundary education programs aimed at increasing environmental awareness and fostering an expanded stewardship ethic throughout the basin.

In order to address landscape-level concerns, there is growing work being done by several groups and agencies on shared data collection, storage and harmonization. Since there is no standardized method or measurement system for collecting field data on many ecosystem function indicators, nor a single data management and storage program, data

collected by one team is often unusable for others working on the same set of issues at different institutions or agencies. This is especially true when working across an international border. The Crown Managers Partnership has created transboundary watershed maps for the Crown of the Continent region (includes portions of Montana, Alberta, and B.C.) for use by fish and wildlife managers working on both side of the border. Erin Sexton and her co-researchers at the University of Montana's Institute on Ecosystems are helping complete this work, which also receives financial support from the Great Northern Landscape Conservation Cooperative (GNLCC) and the Roundtable on the Crown of the Continent. Within the transboundary Flathead River ecosystem, there is also successful work being done on a shared database for mapping the movement of native salmonid populations. This work is primarily being completed outside of a transboundary entity through direct collaboration between the USGS, Montana Fish, Wildlife and Parks, and the Province of British Columbia; however individual members of the Roundtable, including Erin Sexton, are participating.

Both of the Landscape Conservation Cooperatives working in the region are currently funding projects that address these issues. The GNLCC and NPLCC are actively sponsoring the NorWeST stream temperature monitoring database, in partnership with the U.S. Forest Service, among others. NorWeST is an open source, online repository for temperature readings from over 15,000 stream sites across the northwest, and also includes geospatial mapping resources. This project was initiated in order to assist aquatic biologists and other researchers in measuring and modeling both fine and large scale aquatic habitat over time. As of 2015, the database only contains readings and maps from the northwestern United States, but the GNLCC is currently funding a pilot project with the Pacific Salmon Foundation to expand the stream temperature database to include British Columbia. The hope is that this project, combined with NorWeST, will ultimately provide a consistent set of international stream temperature scenarios, allowing the GNLCC and others working on the landscape to conduct comprehensive planning and vulnerability assessments for transboundary aquatic species.

The NPLCC has gone one step further, sponsoring a series of data harmonization and integration workshops for field researchers in both the U.S. and Canada. As part of this project, the NPLCC maintains a web-based, publically accessible Conservation Planning Atlas where the data is housed. The online portal currently contains over 900 different GIS data layers with information and maps related to natural resource management, climate change, and conservation activities throughout the coastal Pacific Northwest, and is continually expanding as data is integrated and added to the database. Also included on the Conservation Planning Atlas website are an array of collaboration tools that allow members to join groups dedicated to specific issue areas, share data, and create common maps. The NPLCC is leading the way on data sharing across agencies and borders and this project directly speaks to their mandate to "promote development, coordination, and

dissemination of science to inform landscape level conservation and sustainable resource management in the face of a changing climate and related stressors."[4]

In addition, the NPLCC and GNLCC fund an annual WildLinks Forum that brings together a diverse group of practitioners working throughout the Cascadia region to collectively create a more resilient local ecosystem. Priority areas currently include: salmon and bull trout restoration and conservation; north cascades grizzly bear recovery; maintaining and improving ecological connectivity; Canadian lynx conservation; and identifying and protecting geographic priority areas for species and ecosystem resilience to climate-related stressors. Started in 2012, the WildLinks Forum is led by natural resource professionals from several state, federal and provincial agencies and connects natural resource managers in B.C. and Washington State around these priority areas. This forum does not cover the entire geographic range of the LCCs, but provides a sub-regional working group for individuals focused on one, transboundary section of the landscape that shares distinct and connected aquatic and terrestrial features.

There are a number of other organizations hosting annual meetings aimed at increasing transboundary cooperation and education around a variety of ecosystem and community issues. The Roundtable on the Crown of the Continent sponsors a conference for interested individuals to meet annually and exchange ideas, build relationships, educate one another about what is happening in the Crown region, and identify opportunities to work collaboratively on landscape related projects. According to the Roundtable coordinator, Mary Sexton, their annual meeting has expanded in recent years to include greater participation from Alberta and, to a lesser extent, British Columbia. The annual meetings also enjoy strong participation from regional tribal members including the Blackfoot Confederacy, Confederated Salish and Kootenai Tribes, as well as the Piikani and Ktunaxa Nations. The Roundtable is explicitly *not* an advocacy organization, rather they aim to help educate, communicate and connect with citizens and organizations of all interests and perspectives on topics affecting the current and future management of the Crown ecosystem. This allows the Roundtable to play a neutral facilitator role and has helped build trust among a diverse set of participants who might not otherwise interact.

The Universities Consortium on Columbia River Governance (UCCRG) is dedicated to increasing basin-wide communication and education through the facilitation of a non-partisan forum for transboundary dialogue on Columbia River governance. The initiative connects applied research, at five leading academic institutions in B.C. and four U.S. states, to the needs and interests of actors within the basin and engages students in research, education, and policy dialogue. In the fall of 2012, the UCCRG hosted its 4th transboundary symposium in which more than 150 participants explored the roles and responsibilities of tribes and First Nations in governing the use of water and related

[4] North Pacific LCC. 2015. Retrieved from http://www.northpaciflcc.org/About

resources in the international Columbia basin. Following the symposium, representatives from the tribes and First Nations formed a Steering Committee and obtained external funding to continue this work. Preliminary findings are presented in a 2015 report entitled *A Sacred Responsibility.*

The Lake Roosevelt Forum (LRF) is another example of transboundary cooperation around ecosystem function. The Forum holds a conference every 18 months to help connect citizens and catalyze action around environmental stewardship, sustainable recreation, and tourism in the Lake Roosevelt ecosystem. Like the Roundtable on the Crown of the Continent, and the UCCRG, the LRF is non-partisan and serves as a general clearinghouse for dialogue, providing a voice to the local community, which has no regulatory authority over the management of the transboundary reservoir. Recently there has been greater interest and participation in the conference by Canadians and, for the past few years, the LRF has included dialogue with provincial government groups in British Columbia. According to LRF Director, Andy Dunau, there is great interest in increased collaboration cross-border. Members are now asking the question, "What will cross-border collaboration look like?" in order to get a more precise sense of what type of cooperative activities would be beneficial for participants.

A final example of transboundary collaboration around ecosystem function is the Kootenai River Habitat Restoration Project in the Idaho portion of the Kootenai/y River watershed. The Kootenai Tribe of Idaho coordinates with Idaho Fish & Game, the B.C. Ministry of Forests, Lands, and Natural Resource Operations, Bonneville Power Administration (BPA), the Bureau of Land Management, Montana Fish, Wildlife, and Parks, and the University of Idaho, among others. The program aims to restore habitat by mitigating the negative impacts of land and water use changes, restoring native vegetation and floodplain conditions, restoring aquatic habitat for native fish populations, and creating opportunities for the community to get involved in river stewardship.

Fish Passage and Restoration

Major initiatives and organizations focusing on fish passage and restoration:

- Upper Kootenay Ecosystem Enhancement Program (UKEEP)
- Canadian Columbia River Inter-Tribal Fish Commission (CCRIFC)
- Columbia River Inter-Tribal Fish Commission (CRITFC)
- Upper Columbia White Sturgeon Recovery Initiative (UCWSRI)
- The Kootenai Tribe of Idaho
- Okanagan Nation Alliance (ONA)
- Colville Confederated Tribes
- Upper Columbia United Tribes (UCUT)
- Various state and provincial partnerships (fish and wildlife managers)

While tribes and First Nations, state and provincial agencies, non-profit organizations, and federal ministries, are working on many issues related to fish passage and restoration, there are a few activities that predominate. First is the reintroduction of salmon above the Chief Joseph and Grand Coulee Dams. At present, there is great energy around assessing the feasibility of returning salmon to their native spawning grounds in Canada. Organizations like the Columbia River Inter-Tribal Fish Commission (CRITFC) are spearheading these efforts and talks continue on both sides of the border on how to move forward with restoration in the upper Columbia.

Cross-border cooperation around salmon reintroduction, fish passage and broader fishery conservation issues within the basin range from formal transboundary programs like the Upper Kootenay Ecosystem Enhancement Program (UKEEP) to informal, ad hoc consultation between fisheries biologists in B.C and various U.S. state agencies. Cross-border coordination between the tribes and First Nations appears to be especially well established. The Canadian Columbia River Inter-Tribal Fish Commission (CCRIFC) and its United States counterpart, CRITFC, work together to advocate for the reintroduction of anadromous salmon in the upper Columbia, as well as the restoration and conservation of aquatic habitat for salmon and other important species, such as white sturgeon and Pacific lamprey. The Upper Columbia White Sturgeon Recovery Initiative (UCWSRI), initiated in 2000, includes in its technical working group members from state / provincial and federal government agencies, First Nations and tribal organizations, as well as private industry. Their conservation aquaculture program has released juvenile white sturgeon in both Canada and Washington State in order to help restore natural, sustainable recruitment rates. In recent years, the Kootenai Tribe of Idaho has also worked with CCRIFC to fund the release of juvenile sturgeon in the upper Kootenai/y River.

For nearly 40 years, CRITFC has been, and continues to be, a leading voice on fish passage and restoration in the basin and maintains strong relationships with their Canadian counterparts at CCRIFC and the Okanagan Nation Alliance (ONA). Last year, the 15 Columbia Basin Tribes and 3 First Nations jointly released a common position paper entitled, “Fish Passage and Reintroduction Into the U.S. and Canadian Upper Columbia Basin,” meant to inform U.S. and Canadian governments, as well as other regional stakeholders, on how anadromous salmon and other resident fish can be reintroduced and why reintroduction is an essential element in the potential adjustment of the Columbia River Treaty. Also in 2014, CRITFC sponsored two meetings for the coalition of Columbia Basin Tribes and First Nations, the first of which was a technical meeting on their fish passage work and the second was a larger meeting centered around the future of our salmon. These annual meetings, along with tours of the Canadian headwaters for U.S. tribal members, help cement cross-border relations among the tribal groups, as well as the broader community interested in restoring fish passage to the blocked areas of the Columbia. The ONA, Colville Confederated Tribes, and CCRIFC are currently planning a meeting for salmon leadership and restoration in Canada, similar

to the work already happening south of the border between the Upper Columbia United Tribes (UCUT) and the Council.

In the Kootenai/y and Flathead sub-basins the Montana Department of Fish, Wildlife & Parks works with their counterparts in B.C. and the Canadian Department of Fisheries and Oceans to conserve and manage transboundary fish species including Kootenai white sturgeon, burbot, as well as redband, bull and westslope cutthroat trout. Currently, they are also conducting research on mountain whitefish and sculpin. Funded primarily by BPA, their collaborative work on bull trout in the Wigwam watershed has been ongoing for 20 years and continues to help fishery managers on both sides of the border understand and manage this threatened transboundary species.

Invasive Species and / or Toxics

Major initiatives and organizations focusing on invasive species and/or toxics:

- Crown Managers Partnership
- 100th Meridian Initiative (Columbia Basin Rapid Response Plan)
- Central Kootenay Invasive Species Society (CKISS)
- Great Northern & North Pacific Landscape Conservation Cooperatives
- B.C. – Montana Environmental Cooperation Arrangement
    - B.C. – Montana MOU and Cooperation on Environmental Protection, Climate Action, and Energy
- International Kootenai/y Ecosystem Recovery Team (IKERT)
- Teck Resources with federal, state, provincial, tribal & First Nations partners

Coordination around invasive & non-native species, as well as toxics mitigation, is ongoing in a majority of the Columbia basin lakes and streams. Invasive species have been carried across the border in both directions and pose a serious threat to aquatic and terrestrial habitat. Consequently, all of the invasive species and water quality managers contacted for this report highlight the critical need for heightened cooperation between Canada and the United States on these issues. Currently, coordination is primarily limited to communication and consultation between cross-border entities and individuals. However, there is growing recognition of the need for a concerted, transboundary plan for dealing with invasives as climate change and its associated stressors continue to pose a challenge to those working to suppress existing invasives and rapidly respond to new threats. For example, the 2010 MOU on Environmental Protection, Climate & Energy signed by British Columbia and Montana includes an invasive species provision under its commitment to cooperation on fish and wildlife management issues. In 2015, the Crown Managers Partnership held their annual transboundary forum in Lethbridge, Alberta and chose to focus on the impact of climate change and terrestrial invasive species in the Crown of the Continent region. According to Crown Managers Partnership Steering

Committee member, Erin Sexton, the Partnership is focusing its efforts on the creation and implementation of transboundary invasive species management protocols to be used in Alberta, B.C., and Montana.

Additionally, AIS coordinators in B.C., Alberta, and Montana work collaboratively on addressing the threat of harmful invasives on an individual basis, and through organizations such as the 100th Meridian Initiative and the Central Kootenay Invasives Species Society (CKISS). These organizations help unify eradication efforts by state, provincial, local and federal agencies. The LCCs are also working on communication and planning, sponsoring workshops and helping to raise awareness about the threat these non-native species pose to the region. Managers from both sides of the border expressed concern over the spread of American bullfrog, Yellow flag iris, northern pike, as well as quagga and zebra mussels. There are also many regional and sub-basin specific invasives that pose a threat; however, in terms of coordinating basin-wide activities, the ones listed here appear to be the current species of greatest concern to the basin as a whole.

Finally, coordination on toxics mitigation and water quality is ongoing in the Kootenai/y River basin as well as the Lake Roosevelt section of the Columbia River. In the Kootenai/y sub basin, the Kootenai Tribe of Idaho is working with the Idaho Department of Fish & Game and the International Kootenai/y Ecosystem Recovery Team (IKERT) to monitor water quality. Since 2008, baseline samples in the Elk River, a Canadian tributary of the Kootenai/y, indicate elevated levels of selenium most likely originating from the five coal mines operated by Teck Resources along the Elk River. Following years of tense negotiation and numerous technical advisory committee meetings, including both Canadian and U.S. representatives, Teck agreed to build six mega water treatment plants for its mines, as well as to help convene a transboundary Lake Koocanusa management committee. This group will be co-chaired by a member from B.C. and Montana and its steering committee will consist of representatives from the Montana Department of Environmental Quality, the U.S. EPA, Environment Canada, and relevant B.C. Ministries. Tribal representatives from the Kootenai, Salish and Ktunaxa nations, as well as representatives from local government and Teck Resources, will advise the steering committee. There are also plans for a separate monitoring and research group made up of scientific advisors from both countries. According to Julie Dal Soglio, Director of the EPA's Region 8 Montana Office, they are hoping to get this initiative off the ground within the next year or so. In the meantime, Montana DEQ and FWP continue to take fish and bird tissue samples in Lake Koocanusa in an effort to monitor selenium levels in the resident populations.

In the Lake Roosevelt section of the Upper Columbia, Teck Resources is also funding remediation efforts stemming from decades of chemical and metals pollution originating primarily from its Trail, B.C. smelting operations. The Colville Confederated Tribes, Spokane Tribe of Indians, EPA Region 10, and the Washington Department of Ecology

are leading this water quality mitigation and monitoring effort, and coordinate with Teck Resources, Natural Resources Canada, and the B.C. Ministry of the Environment.

Climate Change

Major initiatives and organizations focusing on climate change:

- B.C. – Washington State Environmental Cooperation Agreement
- B.C. – Montana Environmental Cooperation Arrangement
    - B.C. – Montana MOU and Cooperation on Environmental Protection, Climate Action, and Energy
- B.C. – Idaho Environmental Cooperation Arrangement
- Environment Canada (EC) – Environmental Protection Agency (EPA) Statement of Cooperation on the Georgia Basin & Puget Sound Ecosystem
- Pacific Coast Collaborative
- North Pacific & Great Northern Landscape Conservation Cooperatives

Transboundary initiatives specifically aimed at addressing climate change are primarily in their infancy at this point, or are included as a component of larger landscape and aquatic restoration activities. However, there is increasing recognition of the need to directly address climate change and its role in stream and habitat management, as well as in energy production and resource use. British Columbia has signed MOU's with individual states such as Montana (2010), while larger regional partnerships such the Salish Sea ecosystem health index, published jointly by Environment Canada and the U.S. EPA, are also addressing climate stressors. This is an area ripe for expanded cooperation. Climate change is predicted to impact all aspects of the hydrologic cycle in the Pacific Northwest, with warmer temperatures reducing winter snowpack, increasing spring runoff, and exacerbating summer drought. As such, adaptation and mitigation activities will need to be updated and expanded in order to protect fragile habitat for fish, wildlife, and human populations.

Current collaboration around climate change issues includes the work the LCCs are doing on climate adaptation at the landscape level, as well as MOUs between the states and B.C. on reducing greenhouse gas emissions and investing in clean energy technology. Managers and researchers throughout the region are studying how changes in wildfire patterns (timing, scale, intensity, duration, and composition) are affecting both terrestrial and aquatic habitat, although cooperation cross-border is still in its infancy. Tribal fishery organizations are also extremely concerned about the potential impacts of climate change on aquatic habitat, as salmon and lamprey are particularly sensitive to changes in water quantity and temperature. In its 2014 Spirit of the Salmon restoration plan for the Columbia River, CRITFC devoted a section of the Technical Recommendations to climate change mitigation and adaptation strategies. CRITFC Executive Director, Paul

Lumley, highlights the pressing need for a comprehensive, basin-wide approach to addressing climate change. CRITFC's Technical Recommendations are a first step, but increased support for these pioneering efforts is needed.

Transboundary Cooperation: What Is Working Well?

While many people interviewed for this report had positive things to say about their current transboundary cooperation within the Columbia River basin, there were some initiatives that appear to be more successful than others. Areas where there appears to be a strong or increasing level of success include:

- Transboundary communication and network building
  - For Example: The Lake Roosevelt Forum; Roundtable on the Crown of the Continent; UCCRG
- Data sharing and integration (in some areas)
  - For Example: NPLCC; Crown Managers Partnership
- Connectivity and landscape-level ecosystem management
  - For Example: NPLCC; GNLCC; Crown Managers Partnership
- Cross-border monitoring of salmon, trout, and sturgeon populations in the Kootenai/y and transboundary Flathead watersheds
  - For Example: Partnerships between Montana FWP, the Province of British Columbia, and the U.S. Geological Survey; Crown Managers Partnership; Round Table on the Crown of the Continent
- Tribal and First Nation coordination on all of these activities, especially with regard to fish passage and salmon restoration
  - For Example: ONA and Colville Confederated Tribes; CCRIFC and CRITFC; UCUT
- Conflict / dispute resolution
  - For Example: Advisory committee meetings between Teck Resources, B.C. ministries, U.S. EPA, and Montana Department of Environmental Quality over management of mining operations in the Elk River Valley and selenium monitoring in Lake Koocanusa

Inclusion in this list does not mean there are not gaps, but rather, that there has been concerted effort on the part of multiple organizations to address these issues. For example, the LCCs are making great strides on data sharing and integration, but according to several individuals spoken to for this report, especially those working for state and federal agencies, managers often do not have access to the data they need. Additionally, many data integration efforts are limited to one area of study. For example, since 2008, the International Joint Commission (IJC) has been funding a U.S. and Canada Hydro harmonization project in which they are developing a bi-national, coordinated approach to the integration and management of hydrographic datasets for drainage basins that straddle the Canadian – United States border. While this information is certainly useful to many natural resources managers, it only provides data on stream hydrology. That is why efforts like the NPLCC's Conservation Planning Atlas are so relevant – the

Atlas includes data on a much broader range of topics including land cover, soil and forest vulnerability to climate change, and the location and extent of riparian areas in the coastal Pacific Northwest. Expanding this database to include the entire Columbia basin could provide a helpful tool for managers working on the ground throughout the region.

How Could Transboundary Cooperation Be Improved?

While there are a few areas that have strong cross-border collaboration already in place, other issue areas have weaker connections. This is due to a variety of factors such as limited time and funding, lack of leadership, distance between potential collaborators, and conflicting mandates and political agendas. These areas include:

- Coordination between the upper Columbia River basin and the lower reaches
- Funding / staff availability
- Long-term political support for activities, especially at the federal level
- Basin-wide coordination of hatchery activities
- Basin-wide coordination on invasive species
- Cross-border species management (caribou, grizzly)
- Columbia River estuary and floodplain restoration
- Disparity between BC Hydro's support for ecosystem function, salmon restoration, and fish passage work in Canada and BPA's support for the same activities in the United States

One of the principal takeaways from this project is that while there is a significant amount of cross border coordination happening throughout the basin, most of it is limited to regional, sub-basin activities, i.e., between Idaho and B.C. on their shared portions of the Kootenai/y, between B.C. and Washington on Lake Roosevelt fish and invasive species, and between Montana and B.C. and Alberta on ecosystem function, energy, and climate change. Basin-wide coordination appears to be conspicuous by its absence outside of the limited scope of the Columbia River Treaty and the UCCRG. Several of the managers included in this report voiced frustration over the lack of basin-wide coordination or communication around shared issues of concern. The LCCs are doing a great job of working with regional managers to begin taking a larger, landscape-based approach to environmental management. However, the international Columbia River is geographically split between two LCCs, so neither includes an integrated strategy for the international Columbia basin. In addition, fish stock supplementation in some areas of the basin takes place without consultation, leading to possible crowding and density dependence in some areas, while work on invasives between Montana and Alberta is not necessarily coordinated downstream with Washington or Oregon.

Several fisheries managers and scientists voiced concern over the lack of coordinated transboundary hatchery activities, specifically regarding fish production and release.

State and federal fishery managers are aware of the issue and have made concerted efforts to better harmonize management. At the request of the U.S. Congress, the Hatchery Scientific Review Group (HSRG) was formed and asked to review hatchery operations in the Pacific Northwest generally, and the Columbia River Basin specifically. The Columbia River portion of their report was completed in 2009 and U.S. hatchery managers have been working to modify operations in response to the recommendations. These reviews were conducted only within the U.S. reaches of the basin, however, leaving open the question of transboundary hatchery management and cooperation.

A major issue contemporary Columbia basin fishery managers face is lack of food and habitat to support viable fish populations. Due to a variety of factors, including the presence of dams, chemical pollutants, and non-native species, the carrying capacity of the river and its tributaries is not what it once was. A 2015 report[5] by the Independent Scientific Advisory Board (ISAB) finds a growing density dependence (DD) problem in some portions of the basin, making the recovery of key native species less likely. According to the report, DD occurs when a population's density affects one or more vital lifecycle rates, often resulting from competition for limited resources, such as food or habitat. The ISAB report does not deal with hatcheries specifically; however, there is a sense by some that the lack of coordination between hatcheries may contribute to DD problems. Improved communication between hatchery operators on both sides of the international border regarding the type and number of fish being produced, as well as the timing and location of release, is needed to address these problems.

Funding and staff availability is a perennial issue in the realm of natural resource management, but surprisingly did not appear to be the most common barrier to increased transboundary cooperation that we encountered. Most of the individuals who mentioned a lack of funding as a barrier were part of state/provincial or federal agencies. Federal funding cuts in the United States and provincial cuts in B.C. have led to reductions in staff and programmatic activities across the board. Several state fish and wildlife managers expressed a desire to be more involved in collaborative activities, but already face heavy workloads and are unable to hire additional staff. Most of the initiatives included in this report receive a patchwork of funding from a variety of sources including BC Hydro and BPA (primarily hydropower mitigation funds), federal agencies, state funds, extractives companies, sales from state hunting and fishing licenses, tribal organizations, and foundation grants. Several also rely on in-kind support of staff time and resources.

Some Canadian managers also expressed frustration over the fact that BPA spends substantially more annually on the Council's Fish and Wildlife Program than BC Hydro

[5] Independent Scientific Advisory Board. 2015. *Density dependence and its implications for fish management and restoration programs in the Columbia River basin*. Retrieved from https://www.nwcouncil.org/media/7148891/isab2015-1.pdf#page=39

does on its Fish and Wildlife Compensation Program, especially when it comes to sockeye salmon restoration in the Okanagan. They feel that the Canadian portion of the basin suffers from this disparity and argue that increased funding from BC Hydro is necessary to improve ecosystem function in the upper Columbia, and throughout the basin. We do not include this last point of contention to suggest that it is the role of the Council and the Trust to address this disparity directly, but rather to simply note that that this disparity in funding is a real issue impacting the ability of managers to work together on shared issues of concern.

2.2.2 Opportunities for New Transboundary Cooperation

While all of these broad categories of activities have some transboundary work already underway, some activity areas have received more attention than others. Areas that currently have little to no existing cross-border cooperation include:

- Transboundary climate change mitigation and adaptation activities
- Effects of legacy mining on the basin as a whole
- Water quality monitoring, especially in the upper Columbia
- Non-point source pollution
- Effects of forest and timber harvest with respect to sedimentation, habitat (terrestrial and aquatic), and riparian corridors
- Mitigation for Canadian Okanagan salmon
- Post-2024 flood risk management and its implications for current ecosystem enhancement work
- Establishing and maintaining a basin wide "report card" including, but not limited to, a suite of basin wide biophysical, socio-economic and governance "indicators"

All of these areas represent opportunities for building cross-border coalitions within the basin and could be included as part of a larger, integrated transboundary initiative.

Several individuals interviewed for this report are involved in initiatives that are transboundary in theory, but, for a variety of reasons, are not collaborating at this time. For example, the Pacific Northwest Aquatic Monitoring Partnership (PNAMP) is designed to facilitate collaboration around aquatic monitoring topics and promote best practices in monitoring design and implementation. BPA's Fish & Wildlife Program will use their online monitoring Toolset; however, this Toolset was developed by USGS staff and is being used, so far, only in the U.S. portion of the basin. In the past, PNAMP has worked collaboratively with British Columbia on an aquatic monitoring partnership, but that work is no longer active. PNAMP's coordinator, Jen Bayer, expressed great interest in expanding PNAMP to include cross border monitoring activities. Similarly, the Kootenai River Network was once a transboundary organization, however, according to

their Director, Jim Dunnigan, due primarily to budget cuts the Network is functionally a Montana organization at this point. Others, like Steven Waste and his team at USGS's Columbia River Research Lab, are ready and eager to work with their colleagues in B.C. and Alberta on improving ecosystem function throughout the basin, but are unable to do so at this time due to political restrictions on their collaboration while the U.S. State Department reviews the Columbia River Treaty.

2.3. Most Compelling Needs, Interests, and Priorities

One of objectives of this report is to try to identify the most compelling needs and priorities of those currently involved in cross-border cooperation in the Columbia basin, in order to assess where increased facilitation might prove the most useful to participants. Participants identified several areas where they could use assistance including:

- Improving basin-wide coordination
- Coordinating fishery and hatchery management in the mainstem Columbia and its tributaries
- Creating integrated and consistent invasive species management protocols throughout the basin.
- Improving understanding of the interconnectedness and shared responsibility regarding basin-wide resource management, and
- Cultivating a basin identity and basin culture

The greatest need identified through these interviews appears to be the need to improve basin-wide coordination. Researchers hard at work in the transboundary Flathead are often completely disconnected from those working on the same issues in the Okanagan or in the Columbia estuary. Transboundary cooperation is happening, but not at a basin level. Among other problems, this has caused much duplication of effort and funding because practitioners simply don't know what's going on in other parts of the basin. In order to address this issue, some participants in this report expressed an interest in convening annual meetings for technical staff throughout the basin on issues of shared concern. Others suggested the creation of an online forum dedicated to natural resource issues in the Columbia River basin through which managers can coordinate with one another, ask questions about specific problems they are facing, leverage funding and expertise, and collaborate on future projects.

Fisheries managers throughout the basin expressed concern over the disconnect between the many hatcheries in the basin and stressed the need to coordinate fishery and hatchery management in the mainstem Columbia and its tributaries. As plans to reintroduce salmon to the blocked areas of the basin move forward, there needs to be greater

coordination between all of the relevant agencies and actors. Following the 2014 International Columbia River Conference, there has been great energy around moving forward with salmon reintroduction to the blocked areas; however, many unanswered questions remain when it comes to implementation. The tribes and First Nations have taken the lead on these issues and the ongoing cooperation between CRITFC, the Okanagan Nation Alliance, Colville Confederated Tribes, UCUT, CCRIFC, and The Confederated Salish & Kootenai Tribes could serve as a model of transboundary collaboration going forward.

There is also great interest among AIS coordinators for integrated and consistent invasive species management protocols throughout the basin. Currently, some managers feel that not all jurisdictions are on the same page, especially when it comes to northern pike suppression and eradication. Increasing the dialogue between managers in all corners of the basin would help reduce costs, streamline operations, and hopefully prevent new invasions, as the cost of suppression and removal is far higher than prevention. Invasive and non-native species also need to be addressed as part of a larger conversation about climate change, another area where basin-wide cooperation is weak.

While communication about the need for a whole-of-basin or whole-of-landscape approach has certainly grown in the last decade, major gaps remain in the general understanding of how management in the Dalles affects the Okanagan or events in Castlegar affect Camas. Several coordinators and managers highlighted this lack of communication and shared responsibility for the basin as an area where they would like to see improvement. This also plays into the concept of cultivating a basin identity, something the Trust has long been working to foster. The interviews conducted for this report make clear that there is currently a divide between upstream and downstream portions of the basin. This divide is not primarily between the United States and Canada. Rather, it is between those who live in the blocked areas above Chief Joseph and Grand Coulee and those who live below. During the course of our interviews, we heard frustration from both fish and wildlife managers and the tribes and First Nations working above Chief Joseph and Grand Coulee as, ever since the dams went in, they have been obliged to bear the brunt of the costs in terms of loss of habitat, land, and ecosystem function, primarily for the benefit of agribusinesses and urban populations downstream.

Billions of dollars have been spent on hydropower mitigation efforts. However, many communities appear to have limited autonomy over the management or proper functioning of their local ecosystem. The managers in the upper reaches feel that the upper basin reservoirs are operated primarily for the benefit of residents hundreds of miles away, not for the benefit of local communities. They also feel there is little recognition from downstream inhabitants about the true cost of hydropower and flood control for Portland and Vancouver, WA, and little appetite for a conversation about the

possibility of making changes to the current management system. Given this divide, it is clear that more dialogue is needed between these two "basins" to begin to address the deeply felt frustration that persists, and work toward the cultivation of a unified basin culture.

3.0 CONCLUSION

3.1 Opportunities to Build Upon & Enhance Existing Arrangements

Within the international Columbia River basin there exists many opportunities to build upon and advance the large number of initiatives addressing ecosystem function, fish passage and restoration, invasive species and toxics, climate change, and energy. Through the interview process we found that there are some activities already taking place that show potential to be extremely beneficial to the basin as a whole. These are areas that appear to have a strong foundation of collaboration but where coordination is not currently occurring at a basin scale. These arrangements present the Trust and the Council with an opportunity and a challenge to leverage early successes and existing networks to help create a more cohesive and comprehensive basin management structure. The three activities we would like to highlight – convening annual meetings or forums, creating a publicly accessible, shared transboundary database, and expanding integrating monitoring programs – are detailed below.

Convene Annual Meetings and/or Forums

As noted in the previous section, there are several successful examples of regional level or sub-basin forums that facilitate conversation between different stakeholders and interested parties regarding issues facing their geographic region. Some innovators in this area include the Lake Roosevelt Forum, UCCRG, Cascadia Partnership, the Roundtable on the Crown of the Continent, and the Inter-Tribal aquatic resource management organizations of the Columbia River basin (such as CRITFC, CCRIFC, and UCUT). What all of these entities have in common is the freedom to facilitate communication outside of bureaucratic regulations and restrictions; they are often non-profits with voluntary or in-kind staff and coordinators. Thanks to their neutral mandate, they have the ability to attract wider stakeholder participation. This opens the door for participants to engage in dialogue in a safe and neutral setting, which in turn helps to foster a stronger sense of trust and community.

Identifying and cultivating shared values are another benefit of these forums. Participants acknowledge that they are not always going to agree on the best plan of action, but if they can first identify desired outcomes based on their shared concern for the landscape or ecosystem in which they live and work, it is far easier to work backwards and make collective recommendations based on those shared values. Convening and facilitating annual non-partisan meetings or forums around specific areas of interest to stakeholders would be a logical next step when looking to build upon, and improve, existing dialogue. The entities noted above provide models for how to make connections and foster enduring relationships, which in turn generate successful

initiatives and activities. As Andy Dunau of the Lake Roosevelt Forum has noted, the most successful initiatives are those that people care enough about to invest themselves in; most people will only do so if they feel as though their concerns have been heard and considered. These forums provide such opportunities.

One potential challenge, however, is that meetings need to be held regularly in order to keep the dialogue ongoing and relevant. Making the time to participate in these meetings, and the work that comes out of them, is costly. For this reason, it is important that any new initiative has clear objectives and strong facilitation in order to be effective and worthwhile. Many of the individuals interviewed for this report are willing to participate in such forums, so long as they have clear agendas and strong facilitation. If participants feel their time is not being honored they will be unlikely to participate in the future. As such, it is important that any effort to coordinate and fund these meetings includes a strong facilitation component.

Shared, Publically-Available Transboundary Database

Another area with strong potential for expansion is the collection and integration of data across the basin; specifically the creation of a publicly accessible, shared transboundary database. Such a task would involve extensive data integration and harmonization between entities already building and operating shared databases. Some major innovators in this area are the NPLCC, the IJC, and Crown Managers Partnership. Like the transboundary forums, many of these entities operate within a different geographic scale or only collect data on specific issues, such as stream temperature. At this point, what is needed is either funding to expand one of these existing databases to include information related specifically to the Columbia River basin, or the creation of a database aggregator, which pulls from existing databases. In addition, this report identifies current gaps in data collection, including:

- Information on bull trout spawning in Canadian tributaries
- Geographic extent of pure west slope cutthroat and red band trout populations
- Data on the impacts of Elk River Valley coal mines on fish, wildlife, and water quality in and around Lake Koocanusa, as well as
- Information on the location and spread of terrestrial and aquatic invasive species

A basin-wide database that includes information gathered on these topics, broken down by issue areas, was a recurring request. Having such a comprehensive database could foster collaboration, reduce duplication of effort, and increase public trust in the data collection process. Furthermore, such a database can help draw attention to the need for new initiatives by identifying gaps in collection and monitoring.

Integrated Monitoring Projects

Similar to integrated databases, ongoing, coordinated monitoring projects are needed to help managers and researchers throughout the basin understand current conditions, inform management plans, and model future scenarios. Within the basin there are some key innovators in this area, including PNAMP, the GNLCC, and IKERT. PNAMP is a leader in this area, responsible for coordinating a number of plans and projects, which in turn attract partners like GNLCC, the Council's Fish & Wildlife Program, as well as federal and state managers who take advantage of PNAMP's monitoring tools and online database. Federal, state, tribal, local and private aquatic monitoring programs in the Pacific Northwest evolved independently in response to different organizational and jurisdictional mandates and needs. PNAMP's model is one that could be considered on a broader basin-wide scale to incorporate monitoring on transboundary water quality – one of the current gaps we identify in this report. Another, more ambitious, option would be establishing and maintaining a basin-wide report card including, but not limited to, a suite of basin-wide biophysical, socio-economic and governance "indicators" of basin health.

3.2 Opportunities to Facilitate Transboundary Cooperation

Throughout the interview process, the importance of dialogue and communication was a common theme. Effective communication is a key component of successful initiatives; it is a way in which common values are identified, a means by which to build trust, a tool for information sharing, and a process for determining activities moving forward. Within the basin, this report identifies several opportunities for the facilitation of transboundary cooperation, all of which involve communication:

- Convene an international basin-wide cooperation steering team including members from each issue area (contact information in Appendix 4.2).
- Explore the possibility of facilitating transboundary working groups around each issue area focused on dialogue, coordination, and problem-solving. This could take the form of annual meetings, an online forum, or a combination of both.
- Meet with relevant LCCs working on data integration and explore the possibility of collaborating and expanding upon these projects.
- Facilitate conversations around bridging the upstream and downstream divide that exists on either side of the blocked areas.

Bridging the upstream / downstream divide also incorporates the concept of 'basin culture' that the Trust is working to cultivate. Focusing on what these two communities have in common is a good starting point, because while they sometimes face different problems, they also share similar desires for the health of the basin and its resources. Initiating these conversations can help mitigate this divide and create a more cohesive basin culture.

3.3 Potential Next Steps

A majority of the interviewees expressed the desire to increase their cooperation on basin-wide transboundary issues. Those who declined participating at this time did so because, while they personally understand the benefit of such cooperation, their current organizational mandate does not allow them to engage internationally. As a basin unit, we recognize it is no longer feasible to address issues like climate change, toxic pollution remediation or invasive species management in isolation alone. All of these issues are profoundly interconnected, with the mighty Columbia River at the center. The Columbia River has provided nourishment for the communities surrounding it since time immemorial and the relationship between communities and the river is one of reciprocity. Communities depend on the river for food, energy, transportation, recreation, and spiritual sustenance. In return, the river depends on communities to care for it and use its resources in a sustainable manner. There is no question that our current river management system has provided immense benefit to millions of people; however, these benefits have come at great cost to the river, its inhabitants, and the larger ecosystem. We have taken great strides in addressing these costs, but there is more work to be done.

Sustainably conserving and managing the international Columbia River must be a collaborative effort throughout the entire basin. Increasingly, we see innovative and proactive resource management efforts within the basin, but at this time the work appears to remain disjointed. Whatever the exact format or composition of future cross-border collaboration in the region, what is clear is the need for strong leadership and facilitation. This report has identified several existing initiatives that could be expanded upon, as well as opportunities to make connections where few currently exist.

Participants at the October 2014 International Columbia River conference challenged the Trust and the Council to bring together individuals and organizations from across the international border. They did so because they recognized the truly unique position and resources that the Council and Trust wield in the international Columbia basin. No other organizations in the region possess the same ability to mobilize individuals and entities to come together and address the issues in such a cohesive manner. We hope this report will assist in providing a clearer picture of what cross-border collaboration already exists within the international Columbia River basin, where innovation could be replicated and expanded, and where improvements could be made to benefit the basin as a whole.

APPENDIX 4.1: EXISTING TRANSBOUNDARY ARRANGEMENTS, BY PRIMARY ISSUE AREAS AND PARTICIPATING ENTITIES

Note: Some arrangements / entities cover more than one issue area so they are listed multiple times in this appendix to more accurately reflect the work they do. The number listed after each initiative corresponds to the initiative's summary profile in *Appendix 4.2: Existing Transboundary Arrangements, By Scale*. Entities whose member(s) participated in this report are highlighted in **bold**.

Ecosystem Function

- North American Agreement on Environmental Cooperation (NAAEC) (under the auspices of NAFTA) (#3)
- **Environment Canada (EC) – Environmental Protection Agency (EPA) Statement of Cooperation on the Georgia Basin and Puget Sound Ecosystem (2000)** (#4)
- **CANUWEST – Canada-U.S. Joint Inland Pollution Contingency Plan** (#5)
- North American Wetlands Conservation Act (#9)
    - North American Wetlands Conservation Council
    - Migratory Bird Commission
- North American Waterfowl Management Plan (#8)
    - Pacific Coast Joint Venture
    - Canadian Intermountain Joint Venture
- Georgia Basin / Puget Sound / International Airshed Strategy (#10)
- Salish Sea Ecosystem Conference (Puget Sound – Georgia Basin Ecosystem Research Conference) (#11)
- **British Columbia – Washington State Environmental Cooperation Agreement (1992)** (#12)
    - **Memorandum of Understanding on Environmental Cooperation**
    - British Columbia – Washington Environmental Cooperation Council (ECC)
    - Memorandum of Understanding on Environmental Assessments and Reviews
    - Memorandum of Understanding on Referral of Water Rights Applications
    - Interagency Agreement - Air Quality
    - Interagency Memorandum of Understanding – Columbia River
- British Columbia – Washington State Joint Cabinet Meetings (#13)
    - Washington State – B.C. Coastal and Ocean Task Force (2007)
- **British Columbia – Montana Environmental Cooperation Arrangement (2003)** (#16)
    - **British Columbia – Montana MOU and Cooperation on Environmental Protection, Climate Action, and Energy (2010)**
- Montana – Alberta St. Mary and Milk Rivers Water Management Initiative (#17)
- British Columbia – Idaho Environmental Cooperation Arrangement (2003) (#18)
- Oil Spill Memorandum of Cooperation (Pacific States and British Oil Spill Task Force – 2001) (#19)
- Pacific Northwest Environmental Directors (#20)
- **Pacific Northwest Economic Region (PNWER)** (#21)
- High Ross Treaty (#22)
    - Skagit Environmental Endowment Commission
- **Great Northern Landscape Conservation Cooperative (GNLCC)** (#24)
- **North Pacific Landscape Conservation Cooperative (NPLCC)** (#25)

- The Crown of the Continent Conservation Initiative (CCCI) (#26)
- **Crown Managers Partnership** (#27)
- **Roundtable on the Crown of the Continent** (#28)
- Northwest Straits Marine Conservation Commission (#29)
- Puget Sound Partnership (#30)
- **Lake Roosevelt Forum** (#31)
- **Upper Kootenay Ecosystem Enhancement Plan (UKEEP)** (#32)
- North Cascades Institute Grizzly Bear Restoration Plan (#36)
- **Salmo Watershed Streamkeepers Society** (#37)
- Milk River Watershed Council Canada (MRWCC)/ Milk River Watershed Alliance (MRWA) (#38)
- The Universities Consortium on Columbia River Governance (UCCRG) (#39)
- Coast Salish Gatherings (#40)
- **Upper Columbia United Tribes (UCUT)** (#41)
- Inter-governmental Policy Council – Olympic Coast National Marine Sanctuary (#45)
- **International Kootenai/y Ecosystem Restoration Team (IKERT)** (#46)

Salmon Restoration and Fish Passage

- Pacific Salmon Commission (#6)
- Transboundary Gas Group (Columbia River dissolved gas) (#7)
- Washington – British Columbia Chapter of the American Fisheries Society (#15)
- Puget Sound Partnership (#30)
- **Pacific Northwest Aquatic Monitoring Partnership (PNAMP)** (#33)
- **The Upper Columbia White Sturgeon Recovery Initiative (UCWSRI)** (#34)
- **Upper Columbia United Tribes (UCUT)** (#41)
- **Columbia River Inter-Tribal Fish Commission (CRITFC)** (#42)
- **Canadian Columbia River Inter-Tribal Fisheries Commission (CCRIFC)** (#43)
- **Okanagan Nation Alliance (ONA) / Colville Confederated Tribes** (#44)
    - **The Okanogan/Okanagan Basin Monitoring and Evaluation Program (OBMEP)**
    - **Upper Columbia River Salmon Restoration**
    - **Okanagan Sockeye Reintroduction Program**
- Inter-governmental Policy Council – Olympic Coast National Marine Sanctuary (#45)

Climate Change

- Commission for Environmental Cooperation (CEC) (under the auspices of NAFTA) (#3)
- British Columbia – Washington State Joint Cabinet Meetings (#13)
    - Washington State – B.C. Memorandum on Pacific Coast Collaboration to protect Our Shared Climate and Ocean (2007)
    - Washington State – B.C. Memorandum of Understanding on Coastal Climate Change Adaptation (2008)
    - Washington State – B.C. Joint Action Plan on Awareness and Outreach for Coastal Impacts of Climate Change (2011)

    - Washington State – B.C. Joint Action Plan on Carbon Neutral Government (2011)
- **Pacific Coast Collaborative** (#14)
    - **Action Plan on Climate and Energy**
- **British Columbia – Montana Environmental Cooperation Arrangement (2003)** (#16)
    - **British Columbia – Montana MOU and Cooperation on Environmental Protection, Climate Action, and Energy (2010)**

Energy

- International Osoyoos Lake Board of Control (under the auspices of the IJC) (#1)
- Columbia River Treaty (#2)
    - Libby Coordination Agreement
- **Pacific Coast Collaborative** (#14)
    - **Action Plan on Climate & Energy (2013)**
- **British Columbia – Montana Environmental Cooperation Arrangement (2003)** (#16)
    - **British Columbia – Montana MOU and Cooperation on Environmental Protection, Climate Action, and Energy (2010)**
- **Pacific Northwest Economic Region (PNWER)** (#21)
- High Ross Treaty (#22)
    - Skagit Environmental Endowment Commission

Transboundary River Governance

- International Joint Commission (#1)
- Columbia River Treaty (#2)
    - Libby Coordination Agreement
- Montana – Alberta St. Mary and Milk Rivers Water Management Initiative (#17)
- **Pacific Northwest Economic Region (PNWER)** (#21)
- High Ross Treaty (#22)
    - Skagit Environmental Endowment Commission

Invasive Species

- **Pacific Northwest Economic Region (PNWER)** (#21)
- Columbia Basin Rapid Response Plan (#23)
    - The 100th Meridian Initiative
- **Crown Managers Partnership** (#27)
- **Central Kootenay Invasive Species Society (CKISS)** (#35)

APPENDIX 4.2: EXISTING TRANSBOUNDARY ARRANGEMENTS, BY SCALE (International, Provincial and State, Regional, First Nations & Tribes)

INTERNATIONAL

1. **International Joint Commission (IJC)**
   - i. International Columbia River Board of Control
   - ii. International Osoyoos Lake Board of Control
   - iii. Canada – U.S. Hydrographic Data Harmonization Task Force

Keywords: *Transboundary River Governance, international data harmonization*

Summary: The International Joint Commission is an independent bi-national organization established by the United States and Canada under the Boundary Waters Treaty of 1909. The purpose of the Commission is to help prevent and resolve disputes about the use and quality of boundary waters and to advise Canada and the United States on questions about water resources. The Commission investigates issues only when requested to do so by both nations. Its recommendations are not binding.

The Commission has responsibilities related to the following treaties and agreements: Boundary Waters Treaty of 1909; Great Lakes Water Quality Agreement of 1978, amended 1987; and the Air Quality Agreement (1991). Separate boards are responsible for particular boundary waters issues including the International Columbia River Board of Control and the International Osoyoos Lake Board of Control. Ecology operates Zosel Dam on Lake Osoyoos (straddling the BC border and Oroville, Wash.) to achieve levels mandated by the International Joint Commission in 1982.

Since 2008, the IJC has also sponsored a task force dedicated to integrating and harmonization hydrologic data on all of the transboundary rivers, lakes, and streams that form the border between the United States and Canada. The task force is made up of representatives from Environment Canada, Agriculture and Agri-Food Canada, U.S. Geological Survey, Natural Resources Canada and the U.S. Environmental Protection Agency. The integrated data uses GIS software (ESRI), is publicly available online and is designed to be used by the IJC and other water resource managers working in these transboundary watersheds. The harmonization task force's work is ongoing.

More information:
http://www.columbiarivergovernance.org/A_Shared_Responsibility_2015_FINAL.pdf
http://ijc.org/en_/iolbc/home
http://nhd.usgs.gov/Canada-US_Hydro_Harmonization.pdf

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2. Columbia River Treaty

i. Libby Coordination Agreement

Keywords: *Energy, Transboundary River Governance*

Summary: The Columbia River Treaty (1961) is an agreement between Canada and the United States on the development and operation of dams in the upper Columbia Basin for power and flood control benefits in both countries. The Canadian and U.S. Entities defined by the CRT, and appointed by the national governments, manage the operation and implementation of the treaty requirements. The Canadian Entity is the B.C. Hydro and Power Authority, and the U.S. Entity is the Administrator of the Bonneville Power Administration and the Northwestern Division Engineer for the U.S. Army Corps of Engineers. The CRT also established a Permanent Engineering Board that reports to the governments annually on CRT results, any deviations from the operating plans, and assists the Entities in resolving any disputes.

In 2024 the 60 years of purchased flood control space in Canadian CRT projects expires. Instead of a coordinated and managed plan to regulate both Canadian and U.S. projects for flood control, the CRT calls for a shift to a Canadian operation under which the United States can call upon Canada for flood control assistance. The United States can request this "called-upon" assistance as needed but only to the extent necessary to meet forecast flood control needs in the United States that cannot adequately be met by U.S. projects. When called-upon is requested, the United States will then have to pay Canada for its operational costs and any economic losses resulting from the called-upon flood control operation.

The CRT has no specified end date; it allows either Canada or the United States the option to terminate most of the provisions of the CRT on or after September 16th, 2024, with a minimum of 10 years advance written notice. 2024 is the first year a notice of termination would take effect assuming notice is given by 2014. Unless the CRT is terminated or the federal governments elect to modify the CRT, its provisions continue indefinitely, except for the changes in flood control described above. The U.S. Army Corps of Engineers and the Bonneville Power Administration are conducting a multi-year effort called the 2014/2024 Columbia River Treaty Review.

More information:
http://www.columbiarivergovernance.org/A_Shared_Responsibility_2015_FINAL.pdf
http://www.crt2014-2024review.gov
http://blog.gov.bc.ca/columbiarivertreaty/

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3. **North American Free Trade Agreement (NAFTA)**
   i. North American Agreement on Environmental Cooperation (NAAEC)
   ii. Commission for Environmental Cooperation (CEC)

Keywords: *Ecosystem Function, Climate Change*

Summary: The North American Free Trade Agreement (NAFTA) is a 1994 agreement signed by the governments of Canada, Mexico, and the United States, creating a trilateral trade bloc in North America. As a side-treaty of NAFTA, the North American Agreement on Environmental Cooperation (NAAEC) was created. NAAEC is an environmental agreement between the U.S., Canada, and Mexico to accompany the linearization of trade and economic growth with environmental protection in North America. With the creation of the NAAEC, the Commission for Environmental Cooperation (CEC) was established.

The CEC is an intergovernmental organization comprised of a Council overseeing the implementation of the NAAEC, a Secretariat, and a Joint Public Advisory Committee. The CEC's mission is to foster conservation, protection and enhancement of the North American environment in the context of increasing economic, trade, and social links among Canada, Mexico, and the United States. CEC strategic plans focus on Healthy Communities and Ecosystems, Climate Change-Low-Carbon Economy, and Greening the North American Economy with activities related to enforcement, environmental information, sustainability and pollutants and health.

More information:
http://www.cec.org/Page.asp?PageID=1226&SiteNodeID=310&BL_ExpandID=878

4. **Environment Canada (EC) – Environmental Protection Agency (EPA) Statement of Cooperation on the Georgia Basin and Puget Sound Ecosystem (2000)**

Keywords: *Ecosystem Function*

Summary: The EC and EPA Statement of Cooperation is a framework to promote sustainability in the Salish Sea region. It promotes Canada-U.S. collaboration in addressing the transboundary and global environmental challenges confronting the ecosystem. It confirms the commitment by the two federal levels of government to transboundary collaboration for the health of the Georgia Basin – Puget Sound ecosystem; recognizes the special role and interests of Coast Salish Nations and Tribes; and commits EC and the EPA to develop annual action plans and report to the public on progress.

The Statement of Cooperation Working Group is co-chaired by EC Pacific and Yukon and EPA Region 10 with representation from the Coast Salish Gathering Coordinators, the British Columbia Ministry of the Environment, Washington State Department of Ecology and the Puget Sound Partnership to facilitate a multilateral discussion.

More information:
http://www.columbiarivergovernance.org/A_Shared_Responsibility_2015_FINAL.pdf

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5. CANUWEST – Canada-U.S. Joint Inland Pollution Contingency Plan

Keywords: *Ecosystem Functions*

Summary: The Canada-United States Joint Inland Pollution Contingency Plan provides for cooperative preparedness, reporting, and response measures between Canada and the U.S. when an oil release or hazardous substances emergency occurs along the shared inland boundaries. The "Annex I – CANUSWEST" (1998) is a cross-border plan for response to Oil and Hazardous Material Spills along the inland borders between British Columbia, Canada and the United States. The EPA Office of Emergency Management (OEM) administers programs jointly with Canada to prepare for and prevent environmental emergencies along the northern border of the United States. OEM's Director serves as the EPA chair of the U.S. National Response Team, and OEM's Deputy Director serves as the U.S. Co-chair for the International Joint Advisory Team. The EPA Regions head their geographically corresponding U.S. Regional Response Teams. The agency provides On-Scene Coordinators (OSCs), scientific support coordinators for inland spills, and Remedial Project Managers for hazardous waste remedial actions under Superfund. EPA funds the Environmental Response Team (ERT), which is dispatched at the OSC's request to any response episode exceeding available regional resources. The ERT can provide support for site assessments, health and safety issues, action plan development, and contamination monitoring. Legal expertise is also available from EPA to interpret environmental statutes.

More information: http://www2.epa.gov/emergency-response/us-canada-joint-inland-pollution-contingency-plan
http://www2.epa.gov/sites/production/files/2014-08/documents/us_can_jcp_eng.pdf

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6. Pacific Salmon Commission

Keywords: *Salmon Restoration and Fish Passage*
Summary: Formed in 1985 to implement the newly-signed Pacific Salmon Treaty, the Commission is a sixteen-person body consisting of 4 Commissioners and 4 alternates from the U.S. and Canada and aims to represent all interested parties including commercial fishermen, recreational fishermen, as well as state, local, federal and tribal governments in setting long-term salmon management goals. The Commission itself does not regulate the salmon fisheries but provides regulatory advice and recommendations to the two countries. It has responsibility for all salmon originating in the waters of one country that are subject to interception by the other, affect management of the other country's salmon or affect biologically the stocks of the other country. In addition, the Pacific Salmon Commission is charged with taking into account the conservation of steelhead trout while fulfilling its other functions. The Committee has two major functions: to conserve Pacific Salmon in order to achieve optimum production, and to divide the harvests so that each country reaps the benefits of its investment in salmon management. In effect, this Commission gives both countries a forum through which to resolve their difficult salmon management problems.

In June of 1999, the United States and Canada reached a comprehensive new agreement (the "1999 Agreement") under the 1985 Pacific Salmon Treaty. Among other provisions, the 1999

Agreement established two bilateral Restoration and Enhancement funds: the Northern Boundary and Transboundary Rivers Restoration and Enhancement Fund (Northern Fund) and the Southern Boundary Restoration and Enhancement Fund (Southern Fund). The purpose of the two funds is to support activities in both countries that develop improved information for resource management, rehabilitate and restore marine and freshwater habitat, and enhance wild stock production through low technology techniques.

More information: http://www.psc.org

Contact Information: Vancouver, B.C. Commission office: 604- 684-8081

7. Transboundary Gas Group (Columbia River dissolved gas)

Keywords: *Salmon Restoration and Fish Passage*

Summary: The Transboundary Gas Group (TGG) was organized in 1998 to help coordinate ongoing investigations and dissolved gas management efforts in the transboundary region of the Columbia River Basin. The TGG is a forum of dam operators, government scientists and resource managers from the Columbia Basin in the U.S. and Canada. It is made up of a steering committee and four technical working groups: Biological Effects and Research, Monitoring and Information Sharing, Modeling (Compute Simulations), and Operational and Structural Gas Abatement. The group meets semi-annually to discuss total dissolved gas reduction strategies and problems in the Columbia River and its major tributaries and reports to involved agencies and the BC/WA Environmental Cooperation Council (see #13).

High levels of total dissolved gas (TDG) are often produced below dams when spillway water plunges to depth; TDG is when the partial pressures of atmospheric gases in solution exceed their respective partial pressures in the atmosphere. Supersaturated levels of dissolved gas can cause gas bubble disease in aquatic biota. The Transboundary Gas Group's long term goal is reduce system wide TDG to levels safe for all aquatic life in the most cost-effective manner possible.

More information: http://www.nwd-wc.usace.army.mil/tmt/wqnew/tgg/2004_meeting/BC_WA_ECCPresentationFeb04.pdf

8. North American Waterfowl Management Plan (NAWMP) (under the auspices of the Migratory Birds Convention)

i. Pacific Coast Joint Venture
ii. Canadian Intermountain Joint Venture

Keywords: *Ecosystem Function*

Summary: Recognizing the importance of waterfowl and wetlands to North Americans and the need for international cooperation to help in the recovery of a shared resource, the North American Waterfowl Management Plan (NAWMP) was signed in 1986 by the Canadian Minister of the Environment and the U.S. Secretary of the Interior. In it included a strategy developed by the United States and Canadian governments to restore waterfowl populations through habitat protection, restoration, and enhancement. The management plan has been updated three times,

once in 1994 where Mexico became a signatory to the Plan, 1998 and again in 2004. The NWAMP is international in scope but regional in terms of implementation; partnering up with federal, state, provincial, tribal, and local governments, businesses, conservation organizations, and individual citizens on conservation projects. Leadership and oversight for the Plan's activities are provided by a Committee with delegates from Canada, the U.S., and Mexico. In turn the Committee receives technical advice from a Science Support Team.

As part of this overall management plan, there are two regional initiatives that fall within the purview of this report: the Pacific Coast Joint Venture and the Canadian Intermountain Joint Venture. These joint ventures coordinate wetland management and protection efforts within their geographic territory. To date they have helped conserve thousands of square kilometers of wetland territory on both sides of the border that are critical to migratory birds.

More information: http://www.fws.gov/birdhabitat/NAWMP/index.shtm

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9. North American Wetlands Conservation Act

i. North American Wetlands Conservation Council
ii. Migratory Bird Commission

Keywords: *Ecosystem Function*

Summary: The North American Wetlands Conservation Act (NAWCA) of 1989 provides matching grants to organizations and individuals who have developed partnerships to carry out wetlands conservation projects for the benefit of wetlands-associated migratory birds and other wildlife in the United States, Canada, and Mexico. NAWCA supports activities under the North American Waterfowl Management Plan (see #8), an international agreement that provides a strategy for the long-term protection of wetlands and associated uplands habitats needed by waterfowl and other migratory birds in North America. It does this through a Standard and a Small Grants Program. Both are competitive grants programs that support projects involving long-term protection, restoration, and enhancement of wetlands and associated upland habitats; they require that grant requests be matched by partner contributions at no less than a 1-to-1 ratio. The difference is the Standard Grants Program supports projects in all three countries and the Small Grants Program operates only the U.S. with grant requests not exceeding $75,000.

NAWCA's Grants Program is facilitated through the U.S. Fish and Wildlife Service's Division of Bird Habitat Conservation (Division). The North American Wetlands Conservation Council is a nine-member council established by the NAWCA that reviews the grant proposals and makes recommendations to the Migratory Bird Commission regarding which projects should be funded. The Commission has the final authority to give final funding approval to projects.

More information:
http://www.fws.gov/birdhabitat/Grants/NAWCA/index.shtm

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10. Georgia Basin / Puget Sound / International Airshed Strategy

Keywords: *Ecosystem Function*

Summary: In August of 2002, a Statement of Intent was signed by the Regional Director General of EC Pacific and Yukon and the EPA Region 10 Regional Administrator to develop the Georgia Basin-Puget Sound International Airshed Strategy to develop and implement initiatives to improve air quality in the transboundary Georgia Basin-Puget Sound region. The GBPS International Airshed Strategy was developed by a coordinating committee, under the U.S. Canada Border Air Quality Strategy, a cooperative effort to investigate barriers to reducing air pollution in transboundary air basins in North America developed under the auspices of the 1991 U.S. Canada Air Quality Agreement. The Coordinating Committee is made up of members from regional, provincial, state and federal government agencies, and First Nations and Tribes. Environment Canada Pacific and Yukon Region (PYR) and the Environmental Protection Agency (EPA) Region 10 act as co-lead agencies, coordinating joint activities by the Committee.

The purpose of the Georgia Basin Puget Sound International Airshed Strategy is to: Reduce the impacts of air pollution to human health, ecosystems, and visibility in the GBPS airshed; Prevent future deterioration and work towards continuous improvement of air quality in the GBPS region; Establish practical and effective instruments to address shared concerns regarding transboundary air pollution in the GBPS region.

More information:
http://www.columbiarivergovernance.org/A_Shared_Responsibility_2015_FINAL.pdf
http://www.ec.gc.ca/Air/default.asp?lang=En&n=D6F2B21E-1

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11. Salish Sea Ecosystem Conference (Formerly Puget Sound – Georgia Basin Ecosystem Research Conference)

Keywords: *Ecosystem Function*

Summary: The biennial Salish Sea Ecosystem Conference is the largest, most comprehensive scientific research and policy conference in the Salish Sea region. It is hosted variously by Environment Canada, EPA, Puget Sound Partnership, Ecology and the Ministry of the Environment; alternating BC and WA locations. Purpose is to highlight and connect cross-border

scientific research and management techniques for meaningful action, exploring the science/policy interface. The conferences involve scientists, policymakers, Coast Salish Tribes and First Nations, resource managers, business leaders, elected officials, non-profit organizations, educators, students, and concerned citizens to promote informed action in the Salish Sea based on sound science.

More information: http://www.wwu.edu/salishseaconference/index.shtml

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PROVINCIAL & STATE

12. British Columbia – Washington State Environmental Cooperation Agreement

i. Memorandum of Understanding on Environmental Cooperation
ii. BC – WA Environmental Cooperation Council (ECC)
iii. Memorandum of Understanding on Environmental Assessment
iv. Memorandum of Understanding on Referral of Water Rights Applications
v. Interagency Agreement - Air Quality
vi. Interagency Memorandum of Understanding – Columbia River

Keywords: *Ecosystem Function*

Summary: Under the British Columbia – Montana Environmental Cooperation Agreement of May 7, 1992 British Columbia's Ministry of Environment and Washington's Department of Ecology entered into a Memorandum of Understanding (MOU) which established the Environmental Cooperation Council (ECC).

The ECC's purpose is to ensure coordinated action and information sharing on environmental matters of mutual concern. The ECC is co-chaired by the Director of the Dept. of Ecology and the Deputy Minister of the Ministry of the Environment. Other members include the Environmental Protection Agency (EPA), Environment Canada (EC), and the Department of Fisheries and Oceans Canada Pacific Region.

To address critical cross-border environmental issues that require joint attention by Washington State and BC, the Council establishes and directs the work of Task Forces, which facilitate information sharing, coordination and cooperation on issues of mutual interest. The ECC and its Task Forces have addressed: flooding of the Nooksack River, the Abbotsford Sumas Aquifer, air quality in the Fraser Valley/Pacific Northwest airshed, the shared waters of the Georgia Basin and Puget Sound, and air and water quality issues in the Columbia River Basin.

The ECC still exists but has been inactive in the past two years due to budget constraints, the use of other cross border forums (most notably, joint climate initiatives, Pacific Coast Collaborative, and the EC/EPA Statement of Cooperation), and the spin-off of new working groups due in part to ECC coordination (Dissolved gas groups and Salish Sea science coordination). ECC task forces continue to meet and work in subject areas.

More information:
http://www.columbiarivergovernance.org/A_Shared_Responsibility_2015_FINAL.pdf
http://www.env.gov.bc.ca/spd/ecc/

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13. British Columbia – Washington State Joint Cabinet Meetings

i. Washington State – B.C. Memorandum on Pacific Coast Collaboration to protect Our Shared Climate and Ocean (2007)
ii. Washington State – B.C. Coastal and Ocean Task Force (2007)
iii. Washington State – B.C. Memorandum of Understanding on Coastal Climate Change Adaptation (2008)

iv. Washington State – B.C. Joint Action Plan on Awareness and Outreach for Coastal Impacts of Climate Change (2011)
v. Washington State – B.C. Joint Action Plan on Carbon Neutral Government (2011)

Keywords: Ecosystem Function, *Climate Change*

Summary: Beginning in 2005, Governor Gregoire and Premier Gordon Campbell hosted joint cabinet meetings on a range of cross border trade, economic development, transportation, health, emergency services and environmental issues resulting in over 25 agreements as of 2010. With Campbell's resignation (Nov. 2010), it is not known if his successor will continue these meetings.

The WA/BC Coastal & Ocean Task Force was established in June 2007 through the MOU between Washington and British Columbia on Pacific Coast Collaboration to protect Our Shared Climate and Ocean (a precursor to the Pacific Coast Collaborative – see #15), signed by Governor Gregoire and Premier Campbell. Its mandate is to provide a mechanism to enhance collaboration between the State of Washington and the Province of British Columbia on coastal and oceans issues. The Coastal and Oceans Task Force is to report to the respective governments through the BC/WA Environmental Cooperation Council. The Puget Sound Partnership (see #16) participates in and convenes the Coastal and Oceans Task Force. The task force is empowered to address coastal issues, has a three-year work plan covering transboundary issues of mutual interest, and includes priorities for governance and information sharing; science and policy; shared indicators of ecosystem health; and issue areas for habitat restoration, climate, and water quality.

Washington State – B.C. Memorandum of Understanding on Coastal Climate Change Adaptation (2008) was signed at a Joint Cabinet meeting in Kelowna, BC. This MOU commits the governments to share data & research, collaborate on sea level impact analysis, and work together on communication and policies related to adapting to coastal climate change impacts; signed by Premier Campbell and Ecology Director Manning for WA.

Washington State – B.C. Joint Action Plan on Awareness and Outreach for Coastal Impacts of Climate Change (2011) is an agreement signed between Washington State Department of Ecology Director Ted Sturdevant and B.C. Minister of State for Climate Action John Yap. It is a commitment, born out of the WA-BC MOU on Coastal Climate Change Adaptation, to further strengthen engagement with Washingtonians and British Columbians about how sea level rise threatens critical shoreland areas and communities.

Washington State – B.C. Joint Action Plan on Carbon Neutral Government (2011) is an agreement signed between Washington Department of Ecology Director Ted Sturdevant and B.C. Minister of State for Climate Action John Yap limiting carbon emissions from government operations and promoting awareness of the impacts of sea level rise on coastal areas. It was signed in tandem with the WA-BC Joint Action Plan on Awareness and Outreach for Coastal Impacts of Climate Change (2011).

More information:
http://www.columbiarivergovernance.org/A_Shared_Responsibility_2015_FINAL.pdf

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14. Pacific Coast Collaborative (PCC)

i. Action Plan on Climate & Energy (2013)

Keywords: *Climate Change, Energy*

Summary: On June 30, 2008, the leaders of Alaska, British Columbia, Oregon, California, and Washington signed the Pacific Coast Collaborative Agreement that brings together the Pacific leaders in a partnership and a forum for leadership, mutual action and a common voice on issues affecting the Pacific Coast region. The agreement was signed by Gov. Chris Gregoire, Oregon Gov. Ted Kulongoski, Alaska Gov. Sarah Palin, California Gov. Arnold Schwarzenegger and B.C. Premier Gordon Campbell. The Pacific Coast Collaborative meets at least once a year, with the chair and the meeting location rotating annually through each jurisdiction. The purpose of these meetings is to create a forum for information sharing and create the opportunity for collaborative action by several or all of the members together addressing climate change, ocean health, security, or regional economic growth and stability. PCC topics include clean energy; regional transportation; innovation, research and development; a sustainable regional economy, especially with respect to environmental goods and services; emergency management. Agreements signed in 2007 to take action on climate change between British Columbia and California, Washington and Oregon laid the foundation for the PCC.

The Action Plan on Climate and Energy (2013) is an agreement between British Columbia, Oregon, California, and Washington (the PCC minus Alaska) to lead national and international policy on climate change, transition the West Coast to clean modes of transportation and reduce the large share of greenhouse gas emissions from this sector, and to invest in clean energy and climate resilient infrastructure.

More information: http://www.pacificcoastcollaborative.org/Pages/Welcome.aspx
http://www.pacificcoastcollaborative.org/Documents/Pacific%20Coast%20Climate%20Action%20Plan.pdf

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15. Washington – British Columbia Chapter of the American Fisheries Society

Keywords: *Salmon Restoration and Fish Passage*

Summary: The Washington – British Columbia Chapter of the American Fisheries Society is made up of fisheries biologist from WA and BC interested in the conservation and enhancement of fish populations and their environment, while also advocating on behalf of the educational and technical aspects of the fisheries profession. The mission of the BC-WA Chapter is to advance the conservation and intelligent management of aquatic resources within a context of sound

ecological principles, gather and disseminate information pertaining to aquatic science and fisheries management, and to promote the educational and technical aspects of the fisheries profession.

More information: http://wabc-afs.org/about-us/

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16. British Columbia – Montana Environmental Cooperation Arrangement

i. British Columbia – Montana MOU and Cooperation on Environmental Protection, Climate Action, and Energy

Keywords: *Ecosystem Function, Energy, Climate Change*

Summary: The Province of British Columbia and the State of Montana established the British Columbia/Montana Environmental Cooperation Arrangement in 2003 to identify, coordinate and promote mutual efforts to ensure the protection, conservation and enhancement of their shared environment for the benefit of current and future generations. Both governments recognize that environmental concerns and impacts respect neither geographical nor political boundaries, and that there is significant benefit in cooperation and collaboration on mutual environmental interests.

Acting on the obligation of the 2003 British Columbia - Montana Environmental Cooperation Arrangement, an MOU and Cooperation on Environmental Protection, Climate Action, and Energy was signed in 2010 by the Premier of British Columbia and the Governor of Montana. The MOU provides a framework for collaboration on environmental protection, climate action, and renewable energy. Signatories will work with US and Canada Federal, State, and Provincial governments, Ktunaxa Nation, Confederated Salish and Kootenai Tribes, as well leaders from business, environmental advocates, and scientists.

In terms of environmental protection it is a commitment to work together to remove mining, oil and gas, and coal development in the Flathead River Basin; cooperate on fish & wildlife management; collaborate on any projects with cross-border significance that could possibly degrade land or water resources; share information proactively; and collaborate in responding to emergencies. In terms of climate action it is an agreement to facilitate adaptation to climate change, promote a wood building culture, measure progress in reducing greenhouse gas emissions, and reduce greenhouse gas emissions. In regards to renewable energy the two governments are working together to pursue cooperative clean and renewable transboundary gas policies, harmonized definitions of low impact renewable resources, support the West Renewable Energy Zones (WREZ) Project, encourage a “conversation first” utility framework, leverage energy efficiency through building codes, and enable clean transportation solutions.

More information:
http://www.env.gov.bc.ca/spd/docs/Montana_ENVIRONMENTAL_COOP_ARRANGEMENT.pdf

http://www.gov.bc.ca/igrs/attachments/en/MTEnvCoop.pdf

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17. Montana – Alberta St. Mary and Milk Rivers Water Management Initiative

Keywords: *Transboundary River Management, Ecosystem Functioning*

Summary: The Boundary Waters Treaty formally governs these waters, however, in 2006 the IJC suggested that Alberta and Montana begin high-level discussions regarding the use and management of their shared waters as these rivers were heavily oversubscribed by a variety of users on both sides and suffering from inadequate infrastructure investment and rapid degradation. As a result, a joint Terms of Reference was signed in 2008 by Montana Governor Brian Schweitzer and Premier Ed Stelmach of Alberta, authorizing this transboundary water management plan. The objectives of the initiative include improved access for Alberta and Montana to the shared waters of the St. Mary and Milk Rivers; enhanced decision-making processes that link water management with the needs of water users in both jurisdictions; and reliable water supply access for Alberta irrigators and other water users within the Milk River Basin. There are a wide variety of water uses within the St. Mary and Milk River basins, however, this initiative focuses on irrigation and environmental in-stream flows.
The initiative's working group consists of six members from each jurisdiction including irrigators, city council members, department of natural resources employees and tribal representatives. Additional participants include technical support staff from the IJC, U.S. Bureau of Reclamation, Canadian federal departments, and others, as well as stakeholder groups from around the basin. Their initial recommendations for future action to meet the initiative goals were delivered to the Premier and the Governor in 2010 and work continues on refining and funding these initial recommendations.

More information: http://esrd.alberta.ca/water/programs-and-services/river-management-frameworks/montana-alberta-st-mary-and-milk-rivers-water-management-initiative/documents/StMaryMilkRiversInitiative-Terms-2008.pdf

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18. British Columbia – Idaho Environmental Cooperation Arrangement

Keywords: *Ecosystem Function*

Summary: The Province of British Columbia and the State of Idaho established the British Columbia/Idaho Environmental Cooperation Initiative in 2003 to identify, coordinate and promote mutual efforts to ensure the protection, conservation and enhancement of our shared environment for the benefit of current and future generations. Both governments recognize that environmental concerns and impacts respect neither geographical nor political boundaries, and that there is significant benefit in cooperation and collaboration on mutual environmental interests.

More information: http://www.env.gov.bc.ca/spd/docs/Idaho_ENVIRO_COOP_ARNGMNT.pdf
https://www.deq.idaho.gov/media/562986-all_bc_idaho_2004_285_286_287.pdf

Contact Information: Idaho DEQ State Office: (208) 373-0502

19. Oil Spill Memorandum of Cooperation (Pacific States and British Oil Spill Task Force – 2001)

Keywords: *Ecosystem Function, Toxics*

Summary: The Pacific States/British Columbia Oil Spill Task Force was authorized by a Memorandum of Cooperation signed in 1989 by the Governors of Alaska, Washington, Oregon, and California and the Premier of British Columbia, following two oil spill incidents: the tank barge Nestucca spilled oil on the coasts of Washington and British Columbia in 1988; and, three months later, the Exxon Valdez oil spill in Alaska. In 2001 a revised Memorandum of Cooperation was written to include the State of Hawaii and a focus on spill preparedness and prevention needs. The continuing focus of the Task Force is on fostering regulatory consistency, sharing information and resources, and coordinating development and implementation of new policies and programs to reduce the risk of marine oil spills.

The Task Force Members are senior executives from the environmental agencies with oil spill regulatory authority in the states of Alaska, Washington, Oregon, California and Hawaii and the Province of British Columbia. Oil spill program managers from each member agency comprise the Task Force's Coordinating Committee, which oversees activities and projects as authorized by the Members when they adopt a Five Year Strategic Plan and Annual Work Plans. The Coordinating Committee convenes four times a year. The Task Force Members hold their Annual Meetings each summer, rotating locations among member jurisdictions. The Task Force Executive Coordinator staffs the Task Force and provides liaison with stakeholders (industry, agencies, NGOs), arranges and facilitates meetings, develops comments and other documents, and coordinates project implementation.

More information: http://oilspilltaskforce.org

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20. Pacific Northwest Environmental Directors

Keywords: *Ecosystem Functions*

Summary: This group is made up of environmental directors from Washington, British Columbia, Oregon, Idaho, Alaska, Yukon and Alberta and the administrators of EPA R10, and Environment Canada Pacific & Yukon Region. It has been facilitated by Ross & Associates with two or three informal meetings a year.

More information:
http://www.columbiarivergovernance.org/A_Shared_Responsibility_2015_FINAL.pdf

Contact Information:
EPA Region 10, Seattle Office
Phone: 206-553-1200 or 800-424-4372 Email: epa-seattle@epa.gov

21. Pacific Northwest Economic Region (PNWER)

i. Energy & Environment
ii. Water Policy Working Group
iii. Invasive Species

Keywords: *Transboundary River Governance, Energy, Invasive Species*

Summary: Based on a proposal created by the Pacific NW Legislative Leadership Forum in 1988, The Pacific Northwest Economic Region (PNWER) is a statutory public/private non-profit created in 1991 by the states of Alaska, Idaho, Oregon, Montana, Washington, and the Canadian provinces of British Columbia and Alberta. Canada´s Yukon Territory, Saskatchewan and Northwest Territories joined later. PNWER is made up of all state and provincial legislators. The governors and premiers were added to the PNWER governance structure in 1993.

Their mission is to increase the economic well-being and quality of life for all citizens of the region, while maintaining and enhancing our natural environment. PNWER facilitates working groups consisting of public and private leaders to address specific issues impacting the regional economy: Agriculture, Arctic Caucus, Cross Border Livestock Health, Border Issues, Security & Disaster Resilience, Energy I (Transmission), Energy II (Renewable Energy), Environment, Health Care Innovation ,Invasive Species, Sustainable Development, Telecom, Trade and Economic Development, Transportation, Tourism, Water Policy, and Workforce Development.

Through its Water Policy Working Group, PNWER is beginning a dialogue to address important regional water issues such as the renegotiation of the Columbia River Basin Treaty and the effects of climate change on water management. This particular working group is under the leadership of Senator Jim Honeyford of Washington State, David Hill of the Centres and Institutes and Research Advocacy (CIRA) University of Lethbridge, and Felicia Muncaster from PNWER.

More information:
http://www.columbiarivergovernance.org/A_Shared_Responsibility_2015_FINAL.pdf

Contact Information:
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Felicia Muncaster, Program Coordinator (Water Policy Working Group)
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22. High Ross Treaty

i. Skagit Environmental Endowment Commission

Keywords: *Ecosystem Function, Energy, Transboundary River Governance*

Summary: The High Ross Treaty was signed by the U.S. and Canada based on an Agreement between the City of Seattle and British Columbia, resolving their dispute over the Ross Dam. In the Treaty, Seattle agreed not to raise the height of the Ross Dam (which would flood sensitive ecological areas in BC) for 80 years in exchange for the ability to purchase power at rates equivalent to that which they would have achieved had the dam been raised as planned. As part of the Treaty, the Skagit Environmental Endowment Commission was established in order to promote recreation opportunities and preserve the fish and wildlife habitat of the Upper Skagit Watershed until the Treaty expires in 2065.

More information: http://skagiteec.org/about/high-ross-treaty

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23. Columbia Basin Rapid Response Plan

i. The 100th Meridian Initiative

Keywords: *Invasive Species*

Summary: In 2009, British Columbia signed on as a partner in the Columbia Basin Rapid Response Plan, a 100th Meridian Initiative objective, along with Washington, Oregon, Idaho and Montana. The system provides early detection, rapid response and notification about zebra and quagga mussels.

The 100th Meridian Initiative is a cooperative effort between local, state, provincial, regional and federal agencies to prevent the westward spread of zebra/quagga mussels and other aquatic nuisance species in North America. The Columbia River Basin Team is comprised of 100th Meridian Initiative partners primarily in Washington, Oregon, Montana, Idaho, Montana, Wyoming, and British Columbia. In 2011 a response plan was signed by the U.S. Fish and Wildlife Service; Columbia River Intertribal Fish Commission; the states of Idaho, Montana, Oregon, and Washington; and the Canadian province of British Columbia.

More information: http://100thmeridian.org/Columbia_RBT.asp

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REGIONAL

24. Great Northern Landscape Conservation Cooperative (GNLCC)

Keywords: *Ecosystem Function*

Summary: The Great Northern Landscape Conservation Cooperative (GNLCC) partnership is network of U.S. federal, Canadian provincial and federal, Tribal Nations, state, academic, and conservation organizations working to create and move towards a collective vision for the landscape that is science-based and community oriented by funding partner projects across the region. It is one of 22 LCCs established by the U.S. Department of the Interior and it is their job is to provide the context and make the case for why landscape-level conservation and coordination is important. Everyone within the Great Northern Landscape, a binational area that covers over 300 million acres from the Yukon down to northern Wyoming, is a potential partner to the GNLCC. The GNLCC is governed by a Steering Committee, which sets the vision, goals and priorities and an Advisory Team, which works with the GNLCC Coordinators to develop foundational information and provide recommendations to the Steering Committee. The Science Community develops and provides specific science needs and four Partner Forums help set priorities for or support on-the-ground landscape conservation.

The GNLCC is a transboundary organization, but given that is a U.S. Fish and Wildlife project there is more U.S. participation historically. However, GNLCC is currently supporting the Transboundary Flathead River Basin Coordination effort which stems from the 2010 MOU signed by British Columbia and Montana (see #18). Alberta is also actively participating in many of the GNLCC initiatives.

More information: http://greatnorthernlcc.org/

Contact Information:
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25. North Pacific Landscape Conservation Cooperative (NPLCC)

Keywords: *Ecosystem Function*

Summary: Like the GNLCC, the Northern Pacific Landscape Conservation Cooperative (NPLCC) is a collaboration between state, provincial, federal, Tribal / First Nations, academic, and environmental representatives working to achieve a collective landscape vision for the Pacific coastal region extending from northern California up to southern Alaska. The NPLCC promotes development, coordination, and dissemination of science to inform landscape level conservation and sustainable resource management in the face of a changing climate and related environmental stressors. The NPLCC is governed by a Steering Committee (SC) with a core staff that reports to the SC and implements both the SC strategic plan and the day-to-day operations of the LCC. The SC establishes and supervises standing Subcommittees and other ad hoc groups as necessary to help execute its responsibilities.

One of their most successful initiatives at this time is their Conservation Planning Atlas which is a large landscape data set that includes data from both U.S. and Canadian scientists. In order to

create this transboundary information exchange they held a series of data translation workshops in order to convert all the data into one standardized format that could be used by scientists and policy makers on both sides of the border. The dataset is hosted on their servers and is accessible to everyone.

More information: http://northpacificlcc.org/

Contact Information:
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26. The Crown of the Continent Conservation Initiative (CCCI)

Keywords: *Ecosystem Function*

Summary: The 18 million acre region where Montana, British Columbia and Alberta converge is known as the Crown of the Continent Ecosystem. The Crown of the Continent Conservation Initiative (CCCI) was created to advance a long-term conservation vision for the whole of the Crown ecosystem that will sustain the Crown's rich biodiversity, interconnected wildlands, cold, clean waters, diverse and critical habitats, and landscape connectivity, while supporting sustainable and vibrant regional communities.

The CCCI is governed by a Steering Committee of conservation groups, land trusts and academic institutions. It has a Science Advisory Committee that helps focus on key priorities in the face of a changing climate. CCCI is administered by the Yellowstone to Yukon Conservation Initiative, but remains an independent collaborative. In the interest of focusing vital resources where they are needed the most – on the ground, with the grassroots organizations doing conservation work – CCCI only retains one staff person, and a few contractors to serve its partners working around the Crown.

More information: http://www.crownconservation.net/

Contact Information:
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27. Crown Managers Partnership

Keywords: *Ecosystem Function, Invasive Species*

Summary: The Crown Managers Partnership seeks to demonstrate leadership in addressing the environmental management challenges in the Crown of the Continent Ecosystem region by adopting transboundary collaborative approaches to environmental management. The voluntary partnership seeks to build common awareness of Crown interests and issues, shape relationships, and identify collaborative and complementary tasks that the various participating jurisdictions can pursue. The CMP is led by an Interagency Steering Committee (Steering Committee), which

includes representatives from aboriginal agencies; Federal, Provincial and State agencies; the Universities of Calgary and Montana; and the Secretariat. Their water work currently focuses on controlling aquatic invasive species, such as quagga and zebra mussels, but also includes addressing overall water quality in the Crown of the Continent region. The CMP holds an annual conference – the theme for their March, 2015 conference held in Lethbridge, Alberta was *People, Climate and Terrestrial Invasive Species: Taking Collective Action in the Crown of the Continent.*

More information: http://crownmanagers.org/

Contact Information:
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28. Roundtable on the Crown of the Continent

Keywords: *Ecosystem Function*

Summary: The Roundtable on the Crown of the Continent is a network that has been connecting people and organizations within the Crown on topics of community, culture, and conservation for seven years now. The Roundtable has observed and recognized that the future of the Crown is shaped by over 100 government agencies, non-government organizations, and place-based partnerships. The Crown's activities center around their Adaptive Management Initiative to promotes climate adaptation strategies, and the ongoing facilitation of communication and dialogue which they do so through forums, workshops, policy dialogues, newsletters and conferences that all provide an opportunity to exchange ideas, build relationships, and explore opportunities to work together.

The Roundtable is not an official commission authorized by any government agency, nor is it any single group of people; however it is currently co-convened and staffed by the Center for Natural Resources and Environmental Policy, the Lincoln Institute of Land Policy, and the Sonoran Institute with a core leadership team of members representing stakeholders from both the U.S. and Canada to provide input and advice on the activities of the Roundtable.

More information: http://www.crownroundtable.org/index.html

Contact Information:
Mary Sexton, Coordinator, Roundtable on the Crown of the Continent
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29. Northwest Straits Marine Conservation Commission

Keywords: *Ecosystem Function*

Summary: The Commission does not directly involve British Columbia but it is noteworthy because of its focus on the Washington side of the Salish Sea. Some projects are coordinated with BC counterparts, such as marine debris removal. Congress authorized a study of the Northwest

Straits region in the mid-1980s for potential inclusion in the National Marine Sanctuary system. The proposal was rejected and in 1997, Senator Murray and Representative Metcalf established a commission to explore alternative models for protecting and restoring marine resources in the Northwest Straits. The Northwest Straits Marine Conservation Initiative was authorized by Congress in 1998.

Under this initiative, the Northwest Straits Commission is composed of five gubernatorial appointees, one Secretary of the Interior appointee, and a representative from each of the seven counties in the Northwest Straits region. Its members represent each of the Marine Resources Committees, tribes, the Puget Sound Partnership and additional appointments by the Governor. The Northwest Straits Commission provides guidance and resources to the marine resources committees (MRCs). MRCs in the Northwest Straits' seven counties conduct projects to restore nearshore, intertidal and estuarine habitats, improve shellfish harvest areas, support salmon and bottom fish recovery and identify and carry out protection strategies for marine species and habitats. MRCs are citizen-based, with representatives from local government, tribal government co-managers, and the scientific, economic, recreational and conservation communities. Projects carried out by MRCs include mapping eelgrass beds, outreach and education to local communities, restoring native shellfish populations, removal of toxic creosote and invasive Spartina.

More information:
http://www.nwstraits.org
http://www.columbiarivergovernance.org/A_Shared_Responsibility_2015_FINAL.pdf

Contact Information:
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30. Puget Sound Partnership

Keywords: *Ecosystem Function, Salmon Restoration and Fish Passage*

Summary: The Puget Sound Partnership, created in 2007, coordinates the regional effort to cleanup Puget Sound. The Partnership is the backbone organization connecting citizens, governments, tribes, scientists and businesses together to set priorities, implement a regional recovery plan, and ensure accountability for results. The Partnership is also the Regional Recovery Organization for the Puget Sound Salmon Recovery Region as of January 2008. The Partnership was one of the original programs in Congress's 1987 National Estuary Program (NEP) which was established to protect estuaries of national significance that are threatened by degradation caused by human activity. Puget Sound was given priority status in the 1987 amendments to the Clean Water Act. As it stands the Partnership is strictly an organization that operates within the U.S.

More information: http://www.psp.wa.gov/aboutthepartnership.php

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31. Lake Roosevelt Forum

Keyword: *Ecosystem Function*

Summary: The Lake Roosevelt Forum is a clearinghouse for dialogue about Lake Roosevelt and the upper Columbia River. Their mission is to establish a dialogue based on trust and respect of all views that seek common ways to protect and preserve the quality of environment and enhance the quality of life as they relate to the lake and economies of the region. Since the only regulatory authority over the Columbia River belongs to federal agencies, they provide a place for the local communities, tribes, and governments to have their voice heard and contribute to the management of the reservoir and river.

Lake Roosevelt resulted from the finalizing of Grand Coulee Dam in 1942 when the waters rose more than 400 feet to support development of the Bureau of Reclamation's Columbia Basin Project. Grand Coulee Dam blocked the return of salmon from the Pacific, and the free flowing upper Columbia River became regulated. In addition, upstream mining, milling, smelting and pulp operations resulted in toxins, e.g.—lead, zinc and mercury, being embedded in Lake Roosevelt's sediment.

Two Native American tribes, federal agencies, state agencies and four counties have specific interests in the management of the lake. Individually and collectively, they seek to meet a diverse set of environmental, economic and cultural needs. However, their Lake Roosevelt Conference, which happens every 18 months, brings people together from all over the region including Canada. In addition the Forum has been coordinating with local provincial government groups in British Columbia for three to four years now and they are in the process of deciding how to move forward on cross-border activities.

More information: http://www.lrf.org/

Contact Information:
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32. Upper Kootenay Ecosystem Enhancement Plan (UKEEP)

Keywords: *Ecosystem Function*

Summary: The Upper Kootenay Ecosystem Enhancement Plan helps protect and enhance fish, wildlife and habitats in and around Koocanusa Reservoir and its tributaries in the Kootenay River system. It is operated jointly by the Columbia Basin Trust and the Fish & Wildlife Compensation Program (FWCP); the FWCP is a partnership between BC Hydro, the Province of British Columbia, Fisheries and Oceans Canada, First Nations and local communities with a mission to conserve and enhance fish and wildlife and their habitats that are affected by the creation and operation of BC Hydro generation facilities in the Coastal, Columbia, and Peace Regions of British Columbia. The UKEEP funds many large projects annually aimed at restoring lakes,

streams, dry/upland areas, wetlands, and protecting endangered or threatened species within the Kootenay River system.

More information: http://www.cbt.org/initiatives/environmental/?UKEEP

Contact Information:
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33. Pacific Northwest Aquatic Monitoring Partnership (PNAMP)

Keywords: *Salmon Restoration and Fish Passage*

Summary: Pacific Northwest Aquatic Monitoring Program (PNAMP) provides a forum where entities can collaborate voluntarily around aquatic monitoring topics of interest. Their main goal is to improve effectiveness, efficiency, and quality of monitoring programs in the Pacific Northwest to ultimately improve management decision making, in particular anadromous species abundance, distribution, and habitat. The partner-based steering committee endorses participant working groups and teams which in turn map out the forum's activities. The coordinating staff, employed by United States Geological Survey (USGS), serves to enhance and support PNAMP collaboration on topics of importance.

Their main concerns at the moment are trying to get agreement across jurisdictions on a short list of high level environmental indicators, coordinating monitoring efforts and a data collection, and making those monitoring results and data accessible to the public. They recently built a functional, free, online tool set for monitoring practitioners to be able to document their protocols, methods, and sites. Although their work is conceptually transboundary at the moment they have no initiatives where they are working with Canada. In the past they have had conversations with counterparts in British Columbia but nothing came of it.

More information: http://www.pnamp.org/

Contact Information:
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34. The Upper Columbia White Sturgeon Recovery Initiative (UCWSRI)

Keywords: *Salmon Restoration and Fish Passage*

Summary: The Upper Columbia White Sturgeon Recovery Initiative began in 2000 with an agreement signed by Fisheries and Oceans Canada, BC Environment, BC Fisheries and BC Hydro. The Initiative has a technical working group with members from federal, state and provincial government agencies from both Canada and the US, as well as Canadian First Nations

and US Tribes, and industrial stakeholders and environmental groups in the Upper Columbia region. The goal of the Initiative's Recovery Plan is to restore white sturgeon natural recruitment to a level that sustains a population that can provide beneficial uses. They are doing this by diagnosing and reversing natural recruitment failure, preventing further declines in the population, and implementing conservation aquaculture to restore population demographics and preserve genetic diversity. Once abundant, the white sturgeon has suffered a serious decline in numbers, in Canada it is listed under the Species at Risk Act (SARA) but in the US it is not listed as endangered under the Endangered Species Act, in fact it has no federal designation at all.

More information: http://uppercolumbiasturgeon.org/

Contact Information:
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35. **Central Kootenay Invasive Species Society (CKISS)** (formally the Central Kootenay Invasive Plant Committee CKIPC)

Keywords: *Invasive Species*

Summary: The Central Kootenay Invasive Species Society (CKISS) is a non-profit society with a network of partners collaborating to control and manage invasive species in the Central Kootenay region on behalf of their stakeholders and the public. It was formed in 2005 by a group of residents and company/agency representatives in the geographic area of the Regional District of the Central Kootenay and Areas A & B of the Regional District of the Kootenay Boundary who were interested in promoting collaborative approaches to invasive species management. The Society includes representatives from non--profit societies, utility companies, government agencies, and regional companies. Although the initiative is based out of the Central Kootenay region, invasive species do not adhere to any boundaries and therefore the management of them must be transboundary. CKISS currently works with Washington Forest Service, the 100th Meridian Initiative, Idaho Fish and Game, Idaho Department of Agriculture, Government of Alberta, and all of the state counties below the Central Kootenay region.

More information: http://ckiss.ca/

Contact Information:
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36. **North Cascades Institute Grizzly Bear Restoration Plan**

Keywords: *Ecosystem Function*

Summary: Since 1986 North Cascades Institute has inspired closer relationships with nature through direct experiences in the natural world. Their mission is to conserve and restore

Northwest environments through education. One of their initiatives is to supports active restoration of grizzly bears to the Greater North Cascades Ecosystem, a contiguous wildlands that spans across the US/Canada international border. In the US the majority of this ecosystem is under public management as the North Cascades National Park, Ross Lake and Lake Chelan National Recreation Areas, Mount Baker-Snoqualmie, Okanogan, and Wenatchee National Forests, and the Glacier Peak, Pasayten, Mount Baker, Chelan-Sawtooth, Boulder River, Noisy-Diobsud, Alpine Lakes, and Henry M. Jackson Wilderness Areas. In Canada much of this ecosystem is part of Manning and Cathedral Provincial Parks, the Skagit and Cascade Recreation Areas, and Provincial (Crown) Forests. The institute includes the National Park Service, the US Fish and Wildlife Service and various partner agencies that have come together to restore this major key stone species.

More information: http://ncascades.org/discover/north-cascades-ecosystem/grizzly-bear-restoration-plan

Contact Information:
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37. Salmo Watershed Streamkeepers Society (SMSS)

Keywords: *Ecosytem Function*

Summary: The Salmo Watershed Streamkeepers Society is a charitable, non-profit organization that collaborates on transboundary water issues related to the Salmo River. SWSS promotes awareness of threatened fish and wildlife in the Salmo Watershed, produces scientific studies, monitors water resources, is involved in wetland and river habitat restoration, provides educational material to the public, and advocates for environment and natural systems conservation. The Salmo River Watershed is located in an interior-rainforest in the West Kootenay region of British Columbia, Canada. The Salmo River itself is mainly on the Canadian side but a portion of it dips into Washington; it also connects to the Columbia River Basin.

More information: http://www.streamkeepers.bc.ca/

Contact Information:
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Gerry Nellestjin, Coordinator, SMSS

38. Milk River Watershed Council Canada (MRWCC) / Milk River Watershed Alliance (MRWA)

Keywords: *Ecosystem Function*

Summary: The Milk River Watershed Council Canada (MRWCC) is an independent organization that is a broad partnership of interested and informed people living and working in the Milk River

Watershed who provides leadership in watershed management and planning. As a transboundary watershed in southern Alberta, they aim to foster good relationships with their neighbours in the province of Saskatchewan and the state of Montana for the continued co-management of the Milk River waters. Their mandate is to engage governments, stakeholders, other partnerships, and the public in watershed assessment and watershed management planning, considering existing land and resource management planning processes and decision-making authorities. The MRWCC supports the goals of Alberta's Water for Life Strategy in the Milk River Watershed which is: safe, secure drinking water supplies; reliable water supplies for a sustainable economy; and healthy aquatic ecosystems. The MRWCC is made up of 19 Directors. Directors are elected for a two-year term by the membership.

The Milk River Watershed Alliance (MRWA) is a grass roots organization working together to preserve, protect, and enhance natural resources within the Milk River watershed while maintaining the quality of life. The MRWA is a group of basin residents, Conservation Districts, Natural Resource Managers, Tribes, and municipalities working together and covers the four counties of Blaine, Hill. Phillips, and Valley. The MRWA meets quarterly to take care of watershed issues at a local level.

More Information: http://www.mrwcc.ca/

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39. The Universities Consortium on Columbia River Governance (UCCRG)

Keywords: *Ecosystem Function*

Summary: In 2008, faculty from the public universities in the Columbia River Basin created the Universities Consortium on Columbia River Governance to offer a nonpartisan platform to facilitate an informed, inclusive, international dialogue among key decision-makers and other interested people and organizations. Currently it includes faculty members from the University of British Columbia, The University of Montana, The University of Idaho, Oregon State University, and Washington State University. The UCCRG acts as a tool to connect university research, with the help of students, to the needs and interests of actors within the Columbia River Basin. Specifically it provides decision-relevant information through convening an annual symposium for transboundary-centered conversations on governance of the Columbia River and it resources as well as the Columbia River Treaty. The annual symposiums facilitate an informed, inclusive, international dialogue among key decision makers and interested citizens and organization of the Columbia Basin; they are unofficial meetings separate from any formal review of the Columbia River Treaty where the atmosphere is safe and non-judgmental in order for communication to be freely exchanged and relationships built. The most recent symposium (the 4th) was in the fall of 2012 in Flathead Lake in Polson, Montana where over 150 people participated, including leaders from First Nations and tribes in the International Columbia River Basin. The focus of the symposium was to explore the interests, rights, and roles of tribes and First Nations in the Basin.

More information:

http://www.columbiarivergovernance.org/index.html
http://www.columbiarivergovernance.org/A_Shared_Responsibility_2015_FINAL.pdf

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FIRST NATIONS & TRIBES

40. Coast Salish Gatherings

Keywords: *Ecosystem Function*

Summary: The first Coast Salish Gathering took place in 2005 in Jamestown S'Klallam, followed by annual gatherings alternating between BC and WA tribal lands. The Gathering facilitates a shared effort to identify priority environmental concerns, issues, and projects in the transboundary Coast Salish Region that is comprised of the Puget Sound in the United States, the Georgia Basin in Canada, and the Straits of Juan de Fuca shared by both countries. The Coast Salish Gatherings provide a policy dialogue for U.S. tribal leaders and First Nation Chiefs, EPA and Environment Canada to build a collaborative body for mutual understanding to solve the environmental issues and recommend policy and actions to federal and state agencies.

The Coast Salish Gatherings are guided by a Coast Salish Gathering Steering Committee with administrative support from the Swinomish Indian Tribal Community, Northwest Indian Fisheries Commission, Coast Salish Sea Initiative and Georgia Basin Action Plan Steering Committee Coast Salish Nation representatives. Key non-tribal senior officials also participate from: Environment Canada, Pacific and Yukon, EPA Region 10, BC Ministry of the Environment, Washington State Department of Ecology, and the Puget Sound Partnership.

More information:
http://www.columbiarivergovernance.org/A_Shared_Responsibility_2015_FINAL.pdf
www.coastsalish.org

Contact Information:
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41. Upper Columbia United Tribes (UCUT)

Keywords: *Ecosystem Function, Salmon Restoration and Fish Passage*

Summary: The Upper Columbia United Tribes (UCUT) represents five major tribes in the area: the Coeur d'Alene Tribe, the Kalispel Tribe of Indians, the Kootenai Tribe of Idaho, the Spokane Tribe of Indians and the Confederated Tribes of the Colville Reservation. It was formed in 1982 to ensure a healthy future for the traditional territorial lands and to provide a common voice for the region through facilitating unified and effective communication with federal, state and local agencies as well as other tribes and entities. Some of their main concerns at the moment are fish passage and reintroduction, the Columbia River Treaty, and education and awareness within the Upper Columbia region. Currently they are only working south of the border in terms of fish passage and reintroduction, but their long term goal is to work with Canada as well on this issue. They recently completed a joint paper with Canadian First Nations of the Columbia River titled, "Fish Passage and Reintroduction into the US and Canadian Upper Columbia Basin". A document that is meant to inform both US and Canadian governments as well as other regional sovereigns and stakeholders on how anadromous salmon and resident fish can be reintroduced into the Upper Columbia Basin.

More information: http://ucut.org/

Contact Information:
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42. Columbia River Inter-Tribal Fish Commission (CRITFC)

Keywords: *Salmon Restoration and Fish Passage*

Summary: The Columbia River Inter-Tribal Fish Commission (CRITFC) coordinates management policy and provides fisheries technical services for the Yakama, Warm Springs, Umatilla, and Nez Perce tribes. CRITFC's mission is to ensure a unified voice in the overall management of the fishery resources, and as managers, to protect reserved treaty rights through the exercise of the inherent sovereign powers of the tribes. This mission is accomplished with four primary goals: put fish back in the rivers and protect watersheds where fish live, protect tribal treaty fishing rights, share salmon culture, and provide fisher services.

More information: http://www.critfc.org/

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43. Canadian Columbia River Inter-Tribal Fisheries Commission (CCRIFC)

Keywords: *Salmon Restoration and Fish Passage*

Summary: The Canadian Columbia River Inter-Tribal Fisheries Commission (CCRIFC) is a collaborative, non-profit organization of First Nation tribes in Canada committed to the restoration and conservation of fish and the aquatic ecosystems in the upper Columbia River Basin. The group was formed in 1993 by the Okanagan, Ktunaxa and Secwepemc nations. The CCRIFC's mission is to provide scientific and technical advice to its member nations, but its more recent focus has been the restoration of historic runs of the Sockeye Salmon in the Okanagan River in British Columbia, Canada.

CRITFC and CCRITFC have regular and open dialogue with one another because they see themselves as counterparts with similar mandates. At this time however, other than sharing expertise and experience, they are not collaborating on any specific initiatives.

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Bill Green, Director of CCRITFC, Ktunaxa Nation Council
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Will Warnock, Aquatic Biologist, CCRITFC
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44. Okanagan Nation Alliance (ONA) & Colville Confederated Tribes Partnership

i. The Okanogan/Okanagan Basin Monitoring and Evaluation Program (OBMEP)
ii. Upper Columbia River Salmon Restoration
iii. Okanagan Sockeye Reintroduction Program

Keywords: *Salmon Restoration and Fish Passage*

Summary: The Okanagan Nation Alliance (ONA) represents eight member communities, one of which is the Colville Confederated Tribes. They are by nature transboundary and therefore partners on many issues, one of the biggest being salmon restoration and fish passage.

The Okanogan/Okanagan Basin Monitoring and Evaluation Program (OBMEP) is a monitoring program that collects long-term data on summer steelhead and spring Chinook salmon in the Okanogan/Okanagan River Basin. In the United States the OBMEP was created in 2004 and is a program within the Confederated Colville Tribes' Fish and Wildlife Department that is funded primarily by the Bonneville Power Administration through the Columbia Basin Fish Accords. The Canadian OBMEP is an extension of the US OBMEP that has been ongoing since 2005 via the Okanagan Nation Alliance. The four primary goals of OBMEP are: to establish the current status of anadromous fish habitats and fish populations, to establish how the status is changing over time, to establish what effects restoration actions are having on fish populations and habitat conditions, and to establish what effects fishery management actions are having on fish populations.

The Upper Columbia River Salmon Restoration is another partnership between ONA and Colville Confederated Tribes as well as Bill Green from the CCRITFC. They are planning a Canadian Meeting for salmon leadership and salmon restoration (like the one currently in the United States between UCUT and NWPCC).

In 1997 ONA began work to bring the sockeye salmon back into the Okanagan Lake. Through their partnership with Colville Confederated Tribes, ONA was able to receive funding from Bonneville Power Administration for an Experimental Reintroduction of Sockeye Salmon in Skaha Lake from 2000-2003. The experiment results were independently reviewed and accepted on a 12-year adaptive management approach by the ONA, Fisheries and Oceans Canada, Ministry of Environment, Colville Confederated Tribes, and the Bonneville Power Administration. The Okanagan Sockeye Restoration Program is in year 6 of 12.

More information: http://www.colvilletribes.com/index.php
http://www.syilx.org/

Contact Information:
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45. Intergovernmental Policy Council – Olympic Coast National Marine Sanctuary

Keywords: *Ecosystem Function, Salmon Restoration and Fish Passage*

Summary: Olympic Coast National Marine Sanctuary was created in 1994, encompassing 3,310 square miles of Washington coastal waters from Neah Bay to the Copalis River. The sanctuary is entirely encompassed by the traditional harvest areas of the Hoh, Makah, Quileute, and Quinault tribes. In 2007 these tribes joined with the State and the National Oceanic and Atmospheric Administration National Marine Sanctuary Program to create the Intergovernmental Policy Council to inform and cooperate in the management of Olympic Coast National Marine Sanctuary. The Policy Council provides a regional forum for resource managers to exchange information, coordinate policies, and develop recommendations for resource management within the sanctuary.
More information: http://olympiccoast.noaa.gov/management/intergovernmentalpolicy.html
http://olympiccoast.noaa.gov/management/ipc_noaa_moa.pdf
http://www.columbiarivergovernance.org/A_Shared_Responsibility_2015_FINAL.pdf

Contact Information:
Ed Johnstone, Quinault Indian Nation, IPC Chair

46. International Kootenai/y Ecosystem Restoration Team (IKERT)

Keywords: *Ecosystem Function, Salmon Restoration and Fish Passage*

Summary: The International Kootenai Ecosystem Restoration Team (IKERT) is a collaboration between the Kootenai Tribe of Idaho, Montana Department of Fish, Wildlife & Parks, Idaho Fish and Game, the B.C. Ministry of Lands - Operations, and independent consultants working to restore the Kootenai/y River, its aquatic inhabitants, and the surrounding ecosystem. The team is led by the Kootenai Tribe of Idaho.

More information: http://www.restoringthekootenai.org/

Contact information:
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Sue Ireland, Fish & Wildlife Department Director, Kootenai Tribe of Idaho
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APPENDIX 4.3: INTERVIEW FORMAT

Date:		
Name:		
Title:		
Contact Information:		
1. What is the mission or purpose of your organization / department?		
2. What are the three most important issues or initiatives that you are currently working on within the International Columbia River Basin?		
3. Are any of these issues or initiatives transboundary in nature? If yes, what other individuals and organizations are you working with across the border?		
4. What is working well with respect to each of these issues or initiatives? What are your major accomplishments?		
5. How are your existing initiatives funded?		
6. How could these initiatives be improved? Do you need more time, resources/funding, information, partners, etc?		
7. Are there any transboundary issues or concerns that you are aware of that are not being addressed at this time? If yes, would you be interested in working with other people on these issues?		

APPENDIX 4.4: INDIVIDUALS INTERVIEWED FOR THIS PROJECT

Ecosystem Function

Rick Allen, *Program Manager, Environment, Columbia Basin Trust*
William (Billy) Barquin, *Attorney General, Kootenai Tribe of Idaho*
Joe Caravetta, *Inspector, Kootenay Boundary Region, Conservation Officer Service, B.C. Ministry of the Environment*
Yvette Converse, *Coordinator, Great Northern Landscape Conservation Cooperative*
Chip Corsi, *Regional Director, Idaho Fish & Game*
Andy Dunau, *Director, Lake Roosevelt Forum*
Jim Dunnigan, *Libby Dam Hydropower Mitigation Program Coordinator, Montana Department of Fish, Wildlife & Parks and Director, Kootenai River Network*
Crystal Klym, *Program Manager, BC Hydro Fish & Wildlife Compensation Program*
Tom Laurie, *Senior Advisor, Tribal & Environmental Affairs, Washington Department of Ecology*
John Mankowski, *Coordinator, Pacific Coast Landscape Conservation Cooperative*
Brian Marotz, *Hydropower Mitigation Program Coordinator, Montana Department of Fish, Wildlife & Parks*
Bob Naiman, *Professor of Aquatic & Fishery Sciences, Independent Scientific Advisory Board*
Mary Sexton, *Coordinator, Crown of the Continent Roundtable*
Tino Tafoya, *Special Assistant, U.S. Bureau of Reclamation*

Salmon Restoration and Fish Passage

Jen Bayer, *Coordinator, Pacific Northwest Aquatic Monitoring Program*
Paul Lumley, *Executive Director, Columbia River Inter-Tribal Fish Commission*
Jason McLellan, *Resident Fisheries Biologist, Coleville Tribe*
D.R. Michele, *Executive Director, Upper Columbia United Tribes*
Bruce Suzumoto, *Assistant Regional Administrator – Hydropower, National Marine Fisheries Service*
William Warnock, *Aquatic Biologist, Canadian Columbia River Inter-Tribal Fish Commission*
Amy Windrope, *Columbia Basin Policy Team Lead, Washington Department of Fish & Wildlife*
Howie Wright, *Fisheries Program Manager, Okanagan Nation Alliance*

Climate Change

Jessica Pfeffer, *Senior Policy Advisor, Intergovernmental Relations Strategic Policy Division, BC Ministry of the Environment*
Erin Sexton, *Institute on Ecosystems, University of Montana*
Steve Waste, *Columbia River Research Lab, United States Geological Service Western Fisheries Research Center*

Energy
Robert Cromwell, *Director, Seattle City Light*
Joe Dos Santos, *Aquatic Program Lead, Avista Utilities*
Heather Matthews, *BC Hydro*

Invasive Species and Toxics
Tom Boos, *Aquatic Invasive Species Coordinator, Montana Department of Fish, Wildlife & Parks*
Tim Hicks, *Program Manager, Water and Environment, Columbia Basin Trust*
Joe Maroney, *Fisheries Director, Kalispel Indian Tribe*
Julie DalSoglio, *Director, Montana Office, U.S. Environmental Protection Agency*
Mary Lou Soscia, *Columbia River Coordinator, U.S. Environmental Protection Agency*
Jen Vogel, *Central Kooteney Invasive Species Society*