

Institute for Public Policy  
and Economic Analysis

**A Survey of Views of the Competing  
Users of River Water Resources  
in the Intermountain Province  
of the U.S. Columbia River Basin**

By:

**Vandana Asthana, Ph.D.**

Department of Government

June, 2012

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Monograph No. 17



With this latest monograph from the Institute for Public Policy & Economic Analysis, I welcome you to Eastern Washington University. I hope this research will inform your knowledge of the Inland Northwest. Efforts like this Institute monograph series are manifestations of this University's commitment to serve the region. I applaud the initiative of Eastern's Board of Trustees to launch this Institute.

Teaching remains our core mission at Eastern Washington University. Increasingly, teaching and research are interwoven. Our faculty members stay professionally current when publishing in peer-reviewed journals. These achievements, in turn, allow them to better convey the evolving knowledge base of our academic disciplines.

Our students receive an enhanced education if their classroom experience is informed by the content and enthusiasm of their professor's research. Increasingly, we ask students to conduct research projects of their own. Whether conducting their own projects or assisting professors, our students acquire a richer learning experience through research.

Research for academic journals is not the only area our faculty members target, however. Our University also asks its faculty to engage the communities and region from which we draw our students. This research provides a greater sense of place and a commitment by our faculty to it. It also translates academic methods and findings into a broader, and ultimately more relevant, arena: the lives of the residents of the Inland Northwest.

The overarching goal of the Institute for Public Policy & Economic Analysis is to serve the region by translating knowledge. It does this through a variety of activities, including this series, annual economic forecasts, contract research and the Community Indicators Initiative. I invite you to explore its web site ([www.ewu.edu/policyinstitute](http://www.ewu.edu/policyinstitute)) to learn more.

I have tremendous optimism that by collaborating with EWU's faculty, staff and partners, I will continue to ensure our institution will be anchored into the daily course of life throughout the Inland Northwest. During these difficult economic times, our collective future depends on an educated and informed citizenry. Helping our region reach higher levels of knowledge is something this University can and will do.

My office and that of the Institute director welcome all comments on how we might better serve.

A handwritten signature in black ink, reading "Rodolfo Arévalo". The signature is fluid and cursive, written in a professional style.

Rodolfo Arévalo, PhD  
President

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## Acknowledgements

*The author is grateful to officials and representatives of state agencies, tribal reservations and non-profit organizations whose knowledge, experiences and perceptions expressed during personal interviews are used in this monograph to understand the cultural politics of water resources in the region. I sincerely thank them for their time and their contribution in completing this monograph.*

## Executive Summary

**T**his monograph presents findings from a study designed to identify the competing users of water resources of the rivers in the Intermountain Province (IMP) of the Columbia River Basin and their disputations. Water is the lifeline of this region and plays an important role in the sustenance of life and development of the Pacific Northwest. The province is located in the Northeast corner of Washington State and the Northern Idaho Panhandle. There are six sub-basins in the IMP, including Coeur d' Alene, Pend Oreille, Spokane, Upper Columbia, Sanpoil, and Lake Rufus Woods. The Coeur d' Alene sub-basin is in Idaho. The Pend Oreille and Spokane sub-basins are in the states of Washington and Idaho. The remaining sub-basins are within Washington State. Additionally, portions of the Upper Columbia and Pend Oreille sub-basins extend into Canada.

In the history of the Pacific Northwest, the IMP has been home to a luxuriance of clean waters flowing through creeks, streams, rivers and lakes that provide sustenance to the lush, green-forested areas, wildlife and native inhabitants. A set of institutions and water policies transformed this landscape leading to the creation of a "hydraulic society" (Worster, 1985) that serves the competing needs of hydropower, flood control, irrigation, navigation, fisheries, municipalities, industries and ecology. The environmental effects of these policies are evident in the impact they have on ecosystems, gene pools, aquatic habitat and human health risks. As the area's population continues to increase, it puts tremendous pressure on the resources of the rivers, creating conditions for increased competition amongst the various actors that desire a greater portion of the rivers' resources. The monograph puts these trends in perspective.

In view of the ability of government policies to impinge upon the lives they touch, there is an essential need to analyze the impact of policy processes in a region identified with the centrality of fish, free flowing rivers and abundant water resources. The research findings of this study chronicle perspectives of a wide range of stakeholders to provide inputs to policy makers while framing long-term strategies for sustainable water management<sup>1</sup>.

The study examines the competing perceptions that various users of the IMP rivers in the state of Washington have about dam operations, present and prospective future withdrawals of the river system, water quality, changes in water temperature, fish and wildlife, and potential outcomes in the Basin in the wake of impending climate change. Due to constraints, the study could not examine the views of those in Idaho or Canada. The technique adopted in this study was face-to-face, open ended, in-depth interviews, to elicit actor's own narratives about resource use practices in the watersheds. Interviews took place in the summers of 2010 and 2011.

Through in-depth interviews of local government, an electric utility, state agencies, non-profit organizations and affected tribes, the research described in this monograph identifies: (1) the major resources available in Washington's portion of the Intermountain Province, (2) institutions and stakeholders that manage and use these resources, (3) competing uses and contestations that surround the management of these resources, and (4) challenges and policy recommendations. The findings reveal certain challenges that stakeholders feel are common to the region. Given the operational and secondary effects of dam operations that will continue to operate in the IMP landscape, the actors felt that there was no simple prescription for forming,

implementing and managing the water resources of the area under study. Yet there remains an underlying need for reform in the way water is perceived, allocated and negotiated. Some observations made from the interviews conducted in the present study are as follows.

On a physical and geographical scale, the interviewees agreed that all the sub-basins in the Intermountain Province are located in the 'blocked area' of the Grand Coulee and Chief Joseph dams, an area that stops the migration of all anadromous<sup>2</sup> (ocean-going) fish species. The loss of these anadromous fish is a critical aspect of the regional biodiversity that has a wide array of impacts within the province. Water levels in all the main stem reservoirs in the IMP, including Pend Oreille, Coeur d' Alene, Roosevelt, and Rufus Woods lakes, are controlled by the hydropower system. Decisions about water management affect people throughout the Columbia River Basin and beyond. The timing and extent of fills and drawdowns has a profound effect on the ability of the reservoirs in the IMP to sustain fish and affects many species of wildlife. The development changes that accompanied dam building have brought about critical challenges in water quality indicators of these rivers, in certain parts and times of the year, that include such as dissolved oxygen, water temperature, phosphorous, and fecal coliform bacteria levels.

Stakeholders agreed that climate change was an issue that deserves consideration as all actors have a stake in it. According to a Bureau of Reclamation report, areas of the Pacific Northwest, including the IMP, will be affected by changes in climate, causing disruptions in the hydrology, aquatic and wildlife habitats, and precipitation patterns (USBR, 2011). Institutions, state agencies and non-profit groups converge on this assessment, but due to the element of uncertainty in the mapping of timing and occurrence of precipitation patterns, groups

diverge on the process of managing this change. Some non-state actors however emphasized that this uncertainty should be translated into the managing climate change under the "precautionary principle"<sup>3</sup> and not used to the advantage of powerful political interests.

From a governance perspective, the study demonstrated that all actors believed in a strong need for a watershed approach based on hydrological rather than political boundaries. With several state and federal agencies, tribal sovereigns and their overlapping jurisdictions, the hydrology of conjunctive<sup>4</sup> and ground management of water resources tends to be ignored. A consensus emerged that an integrated watershed governance should be an essential part of the decision making process as these decisions create a much wider, more holistic consideration of affected interests. Integrating land use and ground and surface water decisions into a geographic unit can lead to conditions where water policies can respond to the changing landscape of the Pacific Northwest. Although non-profit groups agreed that the Washington Department of Ecology (DOE) has started to engage in watershed governance, groups felt that there still needs to be a concerted effort to collaborate with other basin states, Canada, several tribal sovereigns and other stakeholders to manage these resources wisely.

On a policy level, competing perceptions exist over water resource development and management decisions amongst the state, tribes and non-profit groups. Differences also existed on issues relating to water rights and additional water withdrawals amongst the actors. State agencies like the DOE declare "managing water is one of the critical challenges of the 21st century." However, to some public interest groups, while Washington State projects itself as a competent dynamic, modern and rational regime and tries to shape water policy decisions by scientific and

technical knowledge, the process masks the mainstream orthodox approach of the “supply based”<sup>5</sup> model in water resource development that dominates government thinking. While stakeholder participation is strongly encouraged by the state, interviews of some stakeholders revealed that terms like 'community centred,' 'participatory,' and 'bottom up' have served to qualify but not alter foundational assumptions of government in any way.

Certain people with interests affected by water decisions feel frustrated with decision making processes in state agencies that exclude or marginalize their participation or influence. However, they also conceded that a vibrant civil society in the IMP opens up policy spaces that can challenge pervasive orthodox thinking of the state and help to reconfigure relationships between actors, leading to effective collaboration on certain issues. Yet, some interviewees felt that while state agencies have collaborated and cooperated in some issues of watershed governance, there is still a strong need for a neutral social space where all stakeholders can equally participate and make their voices heard in the corridors of political power.

The road to sustainable water management in the IMP is a long and arduous one. Water

management approaches such as water conservation, conjunctive use of surface and ground water, a paradigm shift from a supply based paradigm positing the abundance of water have the potential to promote the region's economic growth. These approaches are needed to meet human needs and a healthy ecosystem. Sound comprehensive water resource management needs good public policies that depend not just on scientific and technical expertise but also on cultural factors and the willingness of elected public officials to take actions in the face of risks, uncertainties and growing pressures facing our communities.

The monograph is divided into five main sections. The first section introduces the theme, objectives, methodology and the physical and social characteristics of the rivers under the study. The second section discusses the historical framework of development and change within which the approaches of the stakeholders are framed. The third section briefly describes the institutions and actors engaged in water policy management and their roles. The fourth section summarizes the competing perceptions and positions of the stakeholders on how they view the management of these resources. The last section analyzes the implications of these contestations and provides some general policy recommendations.



## 1. A Brief Overview of the Subject Area: the Columbian Landscape

**T**he Columbia landscape consists of the Columbia River and its tributaries that form the dominant water source in the Pacific Northwest. The main stem of the river rises from Columbia Lake in British Columbia and flows for 1,270 miles before it joins the Pacific Ocean in Astoria, Oregon. As the river flows over its course, several tributaries add to it. The major tributaries include the Kootenai, Flathead, Pend Oreille, Clark Fork, Snake and Willamette (USGS/CVO 2002). The Columbia River basin covers an area of 258,000 square miles (Leopold, 1994), constituting a large ecological system with a variety of features that vary naturally on several different timescales. The river and its tributaries run through climatic conditions and topography as varied as any other river in the world (NPCC, 2009), traversing a large number of jurisdictions that include transboundary users in the Canadian province of British Columbia, seven states of the United States and several Indian reservations.

In the history of the Pacific Northwest, the Columbia River Basin has been home to a luxuriance of clean waters flowing through creeks, streams, rivers and lakes that provide sustenance to lush, green-forested areas, wildlife and native inhabitants. This magnificent network of rivers is the lifeline of the region and its ecosystem, transcending national and state borders.

An excellent literature exists, scattered in the form of texts, information bulletins, cultural and historical archives and records of federal and state government, on the northwest Columbia Basin, the Pend Oreille and the Spokane sub-basins. It details the unique history of the sub-basins. There are also many reports on water quality and pollution levels in the Columbia, Pend Oreille and Spokane Rivers; their impact on fish, salmon and wildlife; and the overlapping policies of trans-boundary states, federal, and state agencies. The issues facing the Columbia River system are dynamic and multi-scalar, especially with the Columbia River Treaty up for renegotiation in 2014. However, the trans-boundary issue is beyond the scope of this study<sup>6</sup>.

Human expansion in these basins was a result of institutions and policies that enabled the construction of dams and storage facilities to allocate, store and distribute water. The subsequent economic development yielded enormous social and economic benefits and created a cradle of boomtowns in the state of Washington. This progress had its own costs and benefits but its impacts were largely ignored at the time these policies were framed and pressed into execution.

## 2. Methodology of Study

Two approaches were adopted to understand the historical context and actual practices in water use and management in the subject area. First, a survey of literature was undertaken to understand the historical, social and cultural context of the Columbia River Basin Project and the Intermountain Province (IMP). Second, in order to understand how a complex gathering of actors perceive the river systems, in-depth interviews of the officials of state and local government, federal agencies, nongovernmental organizations, hydropower producers, representatives of Colville, Kalispel and Spokane tribes and recreational groups were conducted. These actors have diverse norms, values, and cultural orientations within the region.

The technique used in this study was face-to-face, open ended, in-depth interviews in order to elicit actors' own narratives. The interview schedule was designed carefully in connection with the flow and sequence of questions needed to be asked from the various actors. The use of simple spoken language, and initially simple questions was adopted to make the respondents feel at ease. More in-depth questions followed these preliminary questions. The consent of respondents at the beginning of the interview was taken to quote them by name or keep their identity undisclosed. An introductory statement was given, conveying the purpose of the study in a way that encouraged the respondents to cooperate.

Maintaining neutrality and objectivity by the interviewer was a key method. Using open-ended questions, the interviewer built a rapport with the respondent so that the interview progressed like a conversation in a congenial environment. The names are only quoted from public records or policy documents reviewed during study. Fifteen

interviews were conducted in total and most interviews ranged from one to two hours. The interviews took place in 2010 and 2011.

The purpose of in-depth interviewing is to allow a deep understanding of issues based on participants' experiences. It allows us to explore interests, understandings, and meanings (Johnson 2002). The benefit of the interviewing process is that it is less formal and therefore offers a better way of capturing participants' point of view and inside information than using quantitative tools and survey methods. Complex questions and issues can be probed through the answers of the respondents. This method allows interviewees freedom to choose the direction of the interview. The strength of this method therefore lies in enabling the understanding of a specific issue in time and space from different points of view. These interviews illustrate how "[respondents'] individual experiences interact with powerful social and organizational forces that pervade the context in which they live and work, and discover these interconnections among people who live and work in a shared context" (Seidman, 1998, pp. 112). Once these interviews were complete, the responses were organized into thematic codes. Subsequently, with constant comparison of data, categories and their properties were identified, which enabled understanding of the perspectives of different water users and their competing claims on the uses of the river system.

The research method has its limitations as well as strengths. In this method, the skill of the researcher and his/her ability to think of questions during the interview, as well as the articulations of the respondent, makes the interview more candid. It is difficult to ask standardized questions and repeat them exactly to varied respondents since the researcher does not predetermine the

questions and the respondent is encouraged to talk freely in depth and detail.

Sometimes, open-ended, in depth questions are subjected to criticism for providing qualitative data that are “soft,” and intangible. An expert in the field, Newman (2003) says, however, “Qualitative data are empirical. They involve documenting real events, recording what people say (with words, gestures, and tone), observing specific behaviours, studying written documents or examining visual images. These are all concrete aspects of expression of facts.” The important thematic questions in this study were: (1) What do the water users believe to be true about the rivers, (2) What do they hold to be relevant, and (3) How do they define what they are doing?

The monograph is divided into five main sections. The first section introduces the theme, objectives, methodology and the physical and social characteristics of the rivers under the study. The second section discusses the historical framework of development and change within which the approaches of the stakeholders are framed. The third section briefly describes the institutions and actors engaged in water policy management and their roles. The fourth section summarizes the competing perceptions and positions of the stakeholders on how they view the management of these resources. The last section analyzes the implications of these contestations and provides a set of policy recommendations.

### 3. Three Rivers in the Intermountain Province of the Columbia River Basin

**T**he Intermountain Province lies within the ecological region of the Columbia River Basin. The province (Figure 1) is located in “the Northeast corner of Washington State and the Northern Idaho Panhandle. There are six sub-basins in the IMP, including Coeur d’ Alene, Pend Oreille, Spokane, Upper Columbia, Sanpoil, and Lake Rufus Woods. The Coeur d’ Alene sub-basin is in Idaho. The Pend Oreille and Spokane sub-basins are in the states of Washington and Idaho. The remaining sub-basins are within Washington State. Additionally, portions of the Upper Columbia and Pend Oreille sub-basins extend into Canada” (GEI, 2004).

Although the waters of the Columbia River Basin comprise an integrated hydrology, wherein changes in the hydrology of one river have serious impacts on another, for a comprehensive understanding of the rivers in the Intermountain Province this monograph defines the physical and social characteristics of the river systems individually. Specifically, the three major rivers studied in the IMP are the Upper Columbia, Pend Oreille and Spokane Rivers, in view of their importance and of the need to provide a manageable scope of the study.

Figure 1: An overview of the Intermountain Ecological Province in relation to the rest of the Columbia River Basin, including the Canadian portion



[http://www.nwcouncil.org/fw/subbasinplanning/admin/level2/intermtn/plan/00\\_Executive\\_Summary.pdf](http://www.nwcouncil.org/fw/subbasinplanning/admin/level2/intermtn/plan/00_Executive_Summary.pdf)

### 3.1 Upper Columbia River

From its Canadian headwaters, the Upper Columbia flows 600 miles where it swells behind Grand Coulee Dam, 150 miles downstream from the US border (USGS, 2011). The Grand Coulee and Chief Joseph Dams are the main dams in the Upper Columbia sub-basin. These multipurpose dams are used for various activities that include hydroelectric power generation, irrigation, navigation, recreation, flood control and commercial navigation. Water storage in the river fluctuates from year to year depending on the snow pack, but constitutes approximately 30 per cent of the average runoff (NPCC, 2009) The sub-basin produces nearly half of the electricity consumed in the Pacific Northwest under normal precipitation.

Grand Coulee is the first of 14 dams in the series of U.S. hydropower projects along the Columbia River. The dream that water could be pumped from the river to irrigate crops in arid central Washington became a reality with this dam. The main environmental impact of the Upper Columbia dams has been the blockade in migration of all anadromous (ocean going) fish in the region. Lack of fish passages does not allow transport of all juvenile migrants out of the region. The small numbers of migrants that succeed in transporting themselves encounter several dams on the way without fish passage facilities, thus preventing the recovery of the endangered Upper Columbia Chinook populations (Laughlin, 2003).

The early inhabitants of this area were tribes that are now part of the Confederated Tribes of Colville Indians. The name has been derived from the Colville River and Fort Colville, a Hudson company trading post. Before the influx of Canadians and Europeans in the mid-1850s, “the ancestors of the 12 aboriginal tribes were nomadic and followed the seasons of nature and sources of food. Their aboriginal territories were grouped primarily

around waterways such as the Columbia, Sanpoil, Okanogan, Snake and Wallowa Rivers. Today, over 9,065 descendants of 12 aboriginal tribes of Indians are enrolled in the Confederated Tribes of the Colville Reservation formed in 1938” (Colville Tribes, 2011). Their reservation is located in Ferry and Okanogan Counties in Washington. Colville Reservation lands are diverse in natural resources and include standing timber, streams, rivers, lakes, minerals, varied terrain, native plants and wildlife.

Salmon played a central role in the diets of the Colville Tribes. Before the dams, the groups were able to catch more than a 1,000 salmon per day at Kettle Falls during peak runs (USDA, 2011). Several varieties of salmon as well as trout, sturgeon and other fish formed part of their staple diet. A five-day salmon ritual held in the presence of the salmon chief was the most important ceremony in the tribal celebrations. Dried fish made up most of their winter diet apart from roots, bulbs and nuts (Pritzker, 1998).

Land in the Upper Columbia Basin is largely a mixture of national forests and private lands. Much of the private land is utilized in agriculture, especially in orchards, dryland grain production and cattle grazing. According to an Environmental Protection Agency (EPA) report, while the number of farms has decreased in the region, the size of farms in the form of agribusinesses has increased (2011). The entire Columbia River Project, much of it south of the Upper Columbia region, irrigates more than half a million acres land and the annual value of crops raised on these lands is estimated over half a billion dollars.

While these developments have brought prosperity to the region, there have also been substantial adverse effects on the native anadromous and resident fish and wildlife of the region. The changes in river system have also affected the life and quality of several tribes who depended for generations on the spiritual, cultural

and aesthetic value of the river and fish. Many wildlife species like bald eagles, osprey and bears also rely on fish from the upper Columbia River and its tributaries. For residents and visitors alike, the river and its tributaries provide commercial and recreational fishing opportunities in the basin. Salmon and steelhead, along with other native fish, however, have declined significantly due to increasing human activities on land and water in the region. Before the dams were built, salmon and steelhead runs, estimated at 10-16 million annually, were the largest in the world. However, today runs rarely top at 3 million at the mouth of the river (NPCC, 2009).

### **3.2 The Pend Oreille River**

This sub-basin of the IMP forms along the Pend Oreille River watershed, encompassing about 16,000 square miles in parts of Washington and Idaho and Canada. According to the Washington Department of Ecology (DOE), the Washington portion of the watershed, often referred to as Water Resource Inventory Area (WRIA) 62, totals about 1,300 square miles in the northeastern part of the state. The Pend Oreille River is a major tributary of the Columbia River (DOE, 2008) and contributes approximately 10% of the total flow of the Columbia. The river originates in Lake Pend Oreille in the Idaho Panhandle and drains the lake from the western end at Sandpoint. The river flows 130 miles through northeast Washington. As it enters Washington, it turns north and flows along Selkirk Mountains, running parallel to Idaho border through 50 miles of Colville National Forest (DOE, 2008). It then crosses the US-Canadian border and enters British Columbia.

One of the first tribes that inhabited the Pend Oreille sub-basin was the Pend Oreille, also known as the Kalispel Tribe. They originally lived in the banks of Lake Pend Oreille, Priest Lake and the Pend Oreille River. The Kalispel Tribe, like many others, were hunters who traded furs for other

useful goods in the nineteenth century. They survived on fish, especially trout, salmon and whitefish, and a root called 'camas' that formed part of their staple diet. They also bartered salmon with other items from people of the West (Pritzker, 1998). The population of bull trout was abundant (Gilbert, 1895) in the river. The bull trout would migrate from Pend Oreille and Priest Lakes into the Pend Oreille River and spawn in the tributaries of the river. The river was also home of anadromous Pacific salmon, steelhead and west-slope cutthroat trout (Wydoski & Whitney, 2003). It is presumed that in their fluvial life, these fish were thriving in the river as resident fish and for the rest of their life as migratory fish in tributaries of Pend Oreille. Detailed information over the distribution and migration pattern of cutthroat is not known. However, it is believed that construction of power plants, lack of fish passages in dams, introduction of non-native fish populations and a lack of proper forest management strategies set in motion a declining trend of cutthroat in the river.

The waters of the Pend Oreille watershed have experienced vast changes in the surrounding economic, environmental and social climate. Increasing population, changes in agricultural patterns, a need for irrigation, changing climate, and dams for power generation are all responsible. These changes adversely affected the occurrence of important aquatic life that once formed the basis for sustenance in the area. This cycle of life was first disrupted with the construction of Albeni Falls Dam in 1955, as the dam is devoid of any provision for fish passage, restricting bull trout's historical migratory route to Lake Pend Oreille. This has resulted in depletion of the migratory species (USFWS, 2002).

There are four dams on the Pend Oreille River. The Boundary dam is owned and operated by Seattle City Light and the Albeni Falls dam is owned and operated by the Army Core of

Engineers (USACE). The Pend Oreille Public Utility District (PUD) operates Box Canyon Dam. Box Canyon Dam was issued a new Federal Energy Regulatory Commission (FERC) license in 2005 and the Boundary Dam is underway for relicensing by FERC. These two dams have also affected water ecology and aquatic life. The river's other two dams, Waneta and Seven Miles, are in British Columbia, and are owned by Teck Cominco and B.C. Hydro. The Albeni Falls Dam, along with other dams in the watershed, produces 200 million kilowatt hours of electricity each year for the Bonneville Power Administration. Like Albeni Falls, none provide for fish passage.

Water of the Pend Oreille River is used in multiple ways: farming, logging, irrigation, domestic water supplies and hydroelectric power generation. Besides the dam owners, a variety of interests operate in the Pend Oreille watershed: Washington State agencies, the Kalispel Tribe, the timber industry, agricultural groups, municipalities, mining, and landowners (Golder Associates, 2006).

### **3.3 The Spokane River**

The Spokane River sub-basin in the IMP spreads over about 2,400 square miles. It includes parts of five Washington counties (Pend Oreille, Stevens, Lincoln, Spokane and Whitman) and three Idaho counties (Benewah, Kootenai and Bonner). The entire drainage basin of Spokane River is 6,240 square miles, out of which 3,840 square miles are above Post Falls Dam at the outlet of Coeur d'Alene Lake (NPPC, 2002). The Spokane River flows approximately 111 miles before entering the Columbia. It drains from the northwest corner of the lake near the city of Coeur d'Alene before flowing west approximately 25 miles through suburban Spokane Valley and the City of Spokane.

The Spokane Falls are situated in mid-downtown Spokane, about a mile away before the river

receives Latah Creek from the south. Then the river flows northwest along western edge of the city, receiving the Little Spokane River from the east about 10 miles northwest of the city center. It then flows in a serpentine manner along the southern edge of the Selkirk Mountains and forms the boundary of Spokane Indian Reservation. There its waters are impounded by Little Falls Dam to form Long Lake reservoir, about 15 miles in length. Below this dam, in its last 29 miles, the Spokane River is known as Spokane Arm of the Lake Roosevelt.

The original inhabitants of the region have been the tribal communities that used the river for over 9,000 years to meet their livelihood and cultural needs. The Coeur d'Alene Tribe, at the headwaters of the river, and Spokane Tribe, at its confluence, have a long history of using the river for their basic needs. These tribes used the river in a manner to ensure that its water quality did not deteriorate: for nourishment, medicinal and spiritual purposes. The Spokane consisted of three bands that lived along the river: the Upper Spokanes lived from Post Falls to the base of Spokane Falls, the Middle Spokanes inhabited Spokane Falls to Little Falls, and the Lower Spokane from Little Falls to its merger with Columbia River. Spokane Falls was a place for tribes to assemble with family and friends and constituted the center of trade and fishing.

The Spokane Tribe was a salmon fishing tribe. Historically, the Spokane River was famous as a recreational and subsistence fishery for both anadromous and resident salmonids (Stone, 1883; Gilbert & Evermann 1895; Scholz et al., 1985). The river supported an ideal habitat for fish populations and remained famous as "Salmon River" (Scholz et al., 1985), where the Spokane Tribe harvested various anadromous species such as chinook, sockeye, and coho and steelhead salmon on the Columbia River, now part of Lake Roosevelt, up to Kettle Falls. In the Spokane River



from its mouth up to Spokane Falls, chinook salmon, sockeye salmon, and steelhead were the primary anadromous species tribal members harvested (Scholz et al., 1985). Some of the fish caught here were among the biggest in the Columbia Basin. About 1,000 people lived in the area before the construction of the Little Falls Dam and caught about 800 fish catch every day (Northwest Council, 2011). Other Indian tribes, the Coeur d' Alene and Colville, also fished at eleven primary sites. Indians also trapped fish in weirs of the river and then released them to keep the balance of fish population in the river.

Evidence suggests that prior to the construction of dams, salmon or steelhead may have passed Spokane Falls in high flow years. Before the construction of Long Lake Dam by Washington Water Power in 1915, several species of salmon were found in the river (Fahey, 1991). Following the construction of Grand Coulee Dam in 1939, salmon was prevented from migrating, thus disrupting the Spokane fishery. In addition, the waters behind the dam rose nearly 400 feet, flooding numerous tribal lands and cultural sites. The tribe struggled with the federal government for years to claim compensation for flooding in tribal lands. Some of the inland lakes of the Spokane reservation support salmonid fisheries that co-exist with warm water species such as largemouth bass and pumpkinseed fish (sunfish). However, the preference of Spokane tribal members has been to catch and consume salmonid species. The fish now found in the river are comprised of rainbow trout, northern pike minnow, bridge lip suckers and several non-native fish species.

The construction of seven dams along the Spokane River was part of development strategies for power generation undertaken during 1890 to 1922. The City of Spokane Water Department owns, operates, and maintains the Upriver Dam, licensed for fifty years (FERC license 3074-WA, 1981-2031). Avista Corporation, a private utility company, owns and operates six hydro facilities on the river. None of them have fish passage facilities. At Little Fall Dam, a fish ladder was built but could not work, leaving salmon to spawn down river from the dam in late 1930s. However, construction of the Grand Coulee Dam put a cap over spawning of salmon in the Upper Columbia, and as a result, in the Spokane River watershed.

The Spokane River was heavily used for irrigation. Its watershed, including Hangman Creek, comprised a region of extensive farming. Because of this, about 45% of native habitat of Spokane sub-basin has been highly modified. The operations of the dams have also influenced wildlife habitats throughout the accessible reaches of the basin. One was decreased water levels over certain stretches, which raise toxicity of the water and lowers dissolved oxygen, resulting in an upsurge of algae blooms and planktons. Subject of increasing attention, the Spokane Valley-Rathdrum Prairie Aquifer that provides drinking water for the 600,000 residents in Kootenai and Spokane Counties, interacts with the river's flow. That relationship is not the subject of this study, however.

## 4. Institutions and Water Stakeholders in the Intermountain Province

**T**here are many water stakeholders in the Intermountain Province of the Columbia River Basin. From federal regulators to state agencies, from citizen groups to irrigation and agricultural representatives, there is a vast landscape of institutions and actors engaged and involved in the province. This section introduces some of the premier institutions functioning in the area, most of whom formed the basis of the interviews in chapter 5. Due to the study's constraints, not all can be highlighted.

### 4.1 Federal Agencies

#### 4.1.1 U.S. Bureau of Reclamation (Reclamation)

The Bureau, part of the Department of the Interior, has been instrumental in the construction of dams, power plants, and canals in 17 western states since its inception in 1902. In the arid West, Reclamation has been responsible largely for its agricultural development. Over time, it has constructed 600 dams and reservoirs, such as Hoover and Grand Coulee Dams. It can boast of being the biggest wholesaler of water in the country, providing water to over 31 million people. It also provides irrigation water to one out of five Western farms, forming a community of about 140,000 farmers. On the 10 million acres of farmland it irrigates, 60% of vegetables and 25% fruits and nuts of the country are produced (NRC, 2004). Reclamation also contributes enormously to hydropower generation in the western United States', as the fifty-eight power plants run by Reclamation annually produce more than 40 billion kilowatt hours of power and generate about a billion dollars in terms of revenues. This power generation caters to the needs of 3.5 million homes (USBR, 2011).

In its own words, Reclamation's role in the Pacific Northwest is the following (USBR, 2010):

*Our goal is to meet the increasing water needs of the Pacific Northwest while protecting the environment and the public's investment. The Pacific Northwest region encompasses the Columbia River Basin, which includes the state of Idaho, supplied from 54 reservoirs with a total active capacity of approximately 18 million acre-feet. Power production facilities at Grand Coulee Dam are among the largest in the world.*

Grand Coulee Dam is the largest hydropower producer in the United States with a total generating capacity of 6,809 megawatts. It is also part of the Columbia Basin Project, irrigating more than 600,000 acres (USBR, 2011). Reclamation's main focus has been the dam, but more recently as it lifted the moratorium for additional water withdrawals, it has been working on providing water to the Odessa Sub Area Aquifer. It does not have a presence in the Idaho portion of the IMP.

#### 4.1.2 U.S. Army Corps of Engineers (Corps)

According to its mission statement, the U.S. Army Corps of Engineers provides vital public engineering services in peace and war to strengthen the nation's security, to energize the economy, and to reduce risks from disasters. The Corps is a very broad-based organisation, spread over in 90 countries worldwide with a workforce of 34,000 civilian and soldiers. According to the Corps, its principles are consistent with the National Environmental Policy Act, the Army Strategy for the Environment with its emphasis on sustainability, other environmental statutes, and the Water Resources Development Acts that

govern Corps activities. "It is one of the nation's largest water management agencies, and plays an important role in ensuring that Americans have enough water to meet their needs" (USACE, 2011). The Corps helps supply water to homes, businesses, and farms nationwide. Corps personnel also work closely with states and local communities to lessen the effects of droughts.

Since the 1930s, the Corps has coordinated and balanced these sometimes competing interests in its management of the dams in the Columbia Basin. From its Seattle regional headquarters, its two main activities in the IMP are the management of Chief Joseph and Albeni Falls dams. The former is the second-large hydro-electricity producing dam in the U.S. and forms Lake Rufus Woods. Its various uses of river water affect anadromous fisheries, either directly or indirectly, due to the dams. The Corps indicated in 1980, however, that multipurpose activities in general do not result only in "positive or negative effects." Instead, "there are trade-offs which must be carefully weighed against each other as we all face new decisions about water use in our future" (USACE, 1980)

#### **4.1.3 Bonneville Power Administration**

The Bonneville Power Administration (BPA) is a federal agency located within the U.S. Department of Energy. The BPA delivers power to 15 states of the central and western United States via its transmission system that carries electricity from 55 hydropower plants operated by the Bureau of Reclamation, U.S. Army Corps of Engineers and the International Boundary and Water Commission.

BPA markets wholesale electricity to public and private utilities and some large industries the Pacific Northwest. The share of BPA-marketed electricity is about half of the total consumption in the region. It also operates over three-fourths of

high voltage transmission in the Northwest. Its Energy Efficiency (EE) group works in combination with public electric utilities, federal agencies, state and local governments, public and private bodies to support cost-effective conservation in the region. It is also charged with mitigating the negative impacts of the federal Columbia River Power System on fish and wildlife through its oversight of the Northwest Power and Conservation Council. Within the IMP, the BPA's main role is the reliable transmission of electricity produced by the federal dams in the province to intermediate and end-users. It also funds several projects in the Intermountain Province for fish recovery and environmental monitoring and assessment.

#### **4.1.4 Environmental Protection Agency**

The Environmental Protection Agency (EPA) is assigned the role of implementing U.S. environmental laws by writing regulations. EPA sets national standards that states and tribes enforce through their own regulations. To maintain human health and environment and economy, the EPA works to protect and maintain drinking water sources and public water systems, the ecological and biological integrity of the nation's wetlands and water ways and the nation's water resources. EPA researchers develop technologies in support of the Clean Water and the Safe Drinking Water Acts. In the Columbia River Basin, the EPA is involved in the Columbia River Toxic Reduction Plan, which provides a watershed based framework for restoring the health of the river by reducing contamination from DDT, PCBs, mercury, PBDEs and other toxics that pose ecosystem and human health risks. The Columbia River Basin is also part of EPA's *Large Aquatic Ecosystems* program, along with other geographic-based efforts that focus on protecting and restoring the health of critical aquatic ecosystems.

## **4.2 State Agencies**

### **4.2.1 Washington Department of Ecology**

The Washington Department of Ecology (DOE) is the Washington State environmental regulatory body instituted in 1970 that functions in the Washington IMP as the water regulator. This department administers and regulates issues of water quality, water rights and water resources. Ecology engages in certain other regulatory actions like shoreline management, the clean-up of nuclear and hazardous waste, and air quality. In the department's own words, the agency's water role is as follows (NRC, 2004):

*We are working closely with Washington communities and their citizens to provide effective water management. Historically, Washington residents have enjoyed an abundance of water, but water availability is no longer a luxury. We are committed to meeting current water needs and ensuring future water availability for people, fish and the natural environment.*

DOE plays a central role regarding water quality actions and enforcement of the Washington rivers, as it sets the water quality standards for protecting and regulating the quality of surface waters in Washington State. The standards implement portions of the federal Clean Water Act by specifying designated and potential uses of water bodies. Regulatory decisions and punitive steps awarded by Ecology can be challenged in the Environmental Hearings Office, divided between the Pollution Control Board and Shoreline Hearings Board.

### **4.2.2 Washington Department of Fish and Wildlife**

The Department of Fish and Wild Life (WDFW) actively works to protect fish by monitoring their natural habitat. In its own words, its role is as follows (WDFW, 2010):

*The Washington Department of Fish and Wildlife (WDFW) serves Washington's citizens by protecting, restoring and enhancing fish and wildlife and their habitats, while providing sustainable fish and wildlife-related recreational and commercial opportunities.*

WDFW issues licenses and permits for recreational and commercial fishing to ensure opportunities for social and economic benefit in the Washington portion of the IMP. About 86 percent of these waters are actively managed for trout, salmon, and other fish species, including 39 fishing access sites and 6 fish hatcheries in the Eastern region (WDFW, 2011). The hatcheries of WDFW produce fish for harvest and provide for the state's popular recreational fisheries and the thousands of jobs that depend on them. Over the years, these hatcheries have also adopted a conservation role for native salmon stocks. Presently, about a third of the state's hatcheries are used in some capacity for wild stock conservation work. WDFW collaborates with tribal, federal and private agencies to examine hatchery options and uses the best available science.

### **4.2.3 Washington Department of Health (DOH)**

Through its Office of Environmental Health, Safety and Toxicology, DOH monitors environmental concerns of rivers, including drinking water, sediment contamination, and the safety of fish consumption from their waters. Through its enforcement of state regulations of on-site sewage systems, it contributes to water quality of the IMP rivers. DOH also sets and enforces standards for municipal drinking water systems.

### **4.2.4 The Northwest Power and Conservation Council**

The Northwest Power and Conservation Council was established under the Northwest Power Act of 1980 to develop and maintain a regional power plan and a fish and wildlife program to balance the

environmental and energy needs of the Pacific Northwest. The governors of the states of Oregon, Washington, Idaho and Montana appoint the Council's members. The Council performs three tasks: (1) the development of a 20 year electric power plan for adequate and reliable energy at lowest economic and environmental cost in the Northwest region; (2) the operation of a program to protect and mitigate fish and wildlife in the Columbia River suffering from ill impacts of hydro-power generation; and (3) the education and involvement of the public in the decision-making process of the Council (NPCC, 2010). "Charged with bringing new order to Columbia River management, the Council has generally drawn praise for its efforts at promoting energy conservation but has had a more difficult time gaining consensus on saving salmon" (Dietrich, 1995, pp. 290). The Northwest Power Act forged a link between regional energy development and fish and wildlife recovery. The Act directs the Bonneville Power Administration to protect, mitigate, and enhance fish and wildlife affected by hydropower dams in a manner consistent with the program developed by the Council.

Specifically, the Council is charged with the task of preparing, and periodically amending, a program to protect, mitigate, and enhance fish and wildlife, and their related spawning grounds and habitat that have been affected by the construction and operation of any hydroelectric project on the Columbia River or its tributaries. This applies to anadromous (ocean-going) fish as well as to resident (non-ocean-going) fish, and terrestrial and aquatic wildlife. A 1996 amendment of the Power Act authorized the Council to create the independent Scientific Review Panel to review projects proposed for funding by Bonneville through the Council's guided development of sub-basin plans throughout the region. The Council continues to be heavily involved in regional power resource planning, hydro-system operations analysis, energy system reliability/adequacy, and

energy-efficiency resource issues. In addition, the Council has been given increased spending accountability for fish and wildlife. In short, the Council has an enhanced role and new responsibilities in the region for fish and wildlife mitigation since the Power Act became law (NPCC, 2010). Its planning actions affect all the rivers in the IMP.

## **4.3 Local Governments**

### **4.3.1 Spokane County**

As in 2010, Spokane County government serves the 471,000 (Spokane Community Indicators) residents of Spokane County in a variety of ways and is an important player in the Spokane River challenges. Within the boundaries of Spokane County are seven incorporated cities. A board of commissioners exercises all county legislative and executive authorities. The mission of the Spokane County government is "dedicated to excellence, by upholding the public trust with responsive, cost effective, customer-driven services that enhance and protect the quality of life for all citizens" (Spokane County, 2011).

In efforts to meet the goals of its public utilities division, the county has a water resources and Water reclamation program. The Water Resources Department in the County addresses the water quality and quantity issues within its boundaries. The mission of the Water Resources Program is to participate in studies and planning efforts for the protection and use of surface and ground water resources in Spokane County; and to serve as informed advisors on these issues to the Spokane County Board of Commissioners and the Spokane County Public Works, Utilities Division (ibid 2011). Its goals are to provide technical assistance, information and education, and to implement projects to protect, enhance, and maintain water resources in Spokane County.

### **4.3.2 City of Spokane**

The Spokane River runs through the City of Spokane, a local player with a strong mayor form of government. The office of the Mayor functions to promote the City's interests with local, state, tribal and federal governments. Spokane sustainability is a key priority of the administration interviewed for this study.<sup>7</sup>

The City believes that Spokane's sustainability efforts will not improve without significant multi-path communication and coordination between government, business, and citizen interests. The City's Utilities division has several departments, among them Wastewater Management, which works on wastewater collection systems wastewater treatment, storm water management, and combined sewer overflow reduction. All of these services are designed and managed to protect local water resources, both rivers and groundwater, which are recognized as intimately connected. The City also has a Water Quality Improvement Program (WQIP) to protect Spokane's water in an integrated fashion. In addition, the City of Spokane is involved with many regional programs aimed at protecting water resources and assuring that adequate water is available for future growth.

### **4.3.3 The Pend Oreille Public Utility District**

The Pend Oreille Public Utility District is a municipal corporation under Washington law. The District owns and operates the Box Canyon Dam (FERC Project No. 2042), a project in which no federal or state money was used in its construction. It was established in 1936 and comprises of three major operating systems. They are: the Box Canyon water system that owns, operates and distributes water in nine individual water delivery systems within the district. As a municipal corporation, the PUD is a non-profit; this means that all the costs of the Box Canyon project are passed on to the people who

consume power from the project.

The district has a Board of Commissioners that holds open meetings regularly. The mission of the PUD is to provide "quality service at low cost." Its Department of Regulatory and Environmental Affairs is in charge of river quality.

## **4.4 Other Stakeholders**

### **4.4.1 The Upper Columbia United Tribes**

Created in 1982, the Upper Columbia United Tribes (UCUT) is one of the key stakeholders in the Intermountain Region of the Inland Northwest. These five tribes are executive order tribes<sup>8</sup>: the Coeur d'Alene Tribe, Confederated Tribes of Colville Reservation, Kalispel Tribe of Indians, Kootenai Tribe of Idaho and Spokane Tribe. These tribes are sovereigns based on treaty/executive order rights with the federal government. The UCUT helps to coordinate effects in fish and wild life habitat amongst them. UCUT also undertakes enhancement of natural land and resources and distributes funds to individual tribes for specific projects. UCUT also collaborates on various environmental issues with people and societies living in the Columbia Basin. Brief descriptions of the three tribes or groups of tribes in northeast and north central Washington were given in chapter 2 and will not be repeated here.

### **4.4.2 Non-profit Groups and Special Interest Groups**

In the IMP, many advocacy groups look out for the region's water resources. The following is a non-exhaustive list. The Center for Environmental Law and Policy's (CELP) mission is to protect and restore the freshwater resources of western Washington and the Columbia River watershed through education, policy reform, agency advocacy, and public interest litigation (CELP, 2010). The Columbia River Keeper's mission is to restore and protect the water quality of the Columbia River and its wildlife from the

headwaters to the Pacific Ocean. The Upper Columbia Group works to restore water quality of the Spokane River to ensure clean fish and recreational opportunities for the community.

The Spokane River Forum is a non-profit organization that creates materials, events and activities promoting regional dialogues for sustaining a healthy river system while meeting the needs of a growing population. Another group, the Washington Land Trust, focuses on preservation of watersheds, waterways, streams, rivers, lakes, wetlands, and adjacent (riparian) corridors and green space, primarily for the benefit of water quality, ecosystems, and open space. In the Pend Oreille River basin, the Lake Pend Oreille Water Keepers strive to protect the water quality of Lake Pend Oreille and improve the health and viability of its people and ecosystem through education, partnership and advocacy for protecting water. Washington Trout evaluates resource management policies, advocating policy changes where appropriate and engages in on-the-ground resource assessment, preservation and restoration. The Lands Council is also active in the region and works to “preserve and revitalize Inland Northwest forests, water, and wildlife through advocacy, education, effective action, and community engagement” (The Lands Council, 2010).

Okanogan Valley Land Council's objectives are to permanently protect aquatic habitat, important wildlife, habitat connectivity and open space, preventing the subdivision and development of privately-owned ranch and forest lands primarily through conservation easements; to build support within the local community for agricultural land and habitat protection; and to collaborate and coordinate efforts with other organizations to maximize overall habitat protection.

#### **4.4. Avista Utilities**

Avista Utilities (Avista) is an energy company involved in the production, transmission and distribution of energy, as well as other energy-related businesses. Avista owns and operates six hydroelectric plants on the Spokane River. On June 18, 2009, the FERC issued a 50-year operating license to Avista for the Spokane River Hydroelectric Project, which comprises five of Avista's six Spokane River plants (Post Falls, Upper Falls, Monroe Street, Nine Mile and Long Lake). The license includes a variety of measures, many based on multi-stakeholder agreements, designed to protect and enhance natural resources connected with the Project and the Spokane River. The licensing document reports (FERC, 2009):

*Important environmental issues identified in this relicensing proceeding include, among others, concerns with: (1) the river's water quality, with specific regard to erosion and sedimentation, low dissolved oxygen levels, elevated water temperatures, and elevated metals and total dissolved gas concentrations; (2) the health of recreationally important fishery resources, including wild and stocked rainbow trout, largemouth and smallmouth bass, and yellow perch; (3) the control of noxious and exotic weeds in the reservoirs and on the shorelands; (4) the protection of project-area wetlands and riparian wildlife habitats; and (5) the aesthetic appearance of the project's bypassed reach at the Upper Falls development.”.*

The sixth plant, Little Falls, is operated under separate congressional authority and is not licensed by FERC. Avista's origin springs from the construction of the Monroe Street Hydroelectric Development in 1889. Today, Monroe Street and its four sister developments in the Spokane River Project provide the region with an average of 100 MW of electric energy, enough to meet the current electrical needs of about 65,000 homes (Avista). About 10 percent of Avista's electricity comes from the Spokane River dams.

#### **4.5 Other Stakeholders**

Municipalities, water districts, farmers, commercial, recreational fishers, the wood products industry, tourism, recreational and water sports organizations who operate in the IMP sub-basins perceive the rivers based on often competing values they attach to them. However, each of these interest groups desires their share of clean water even if it entails additional withdrawals and pressure on the resource.



## 5. Stakeholder Perceptions of the Intermountain Province Rivers' Water Resources

These participants in IMP water issues engage and interact with each other, often with competing interests. Their interactions create a complex and dynamic environment in which water policies are negotiated and implemented. This section discusses the perceptions of some of the key participants, elicited from the interviews.

### 5.1 State Agencies and their Relationship to the River

The agencies<sup>9</sup> of Washington have prioritized water policy decisions for “managing, developing and protecting water and related resources in an environmentally and economically sound manner in the interest of the American Public (USBR, 2011).” They remain committed to protecting and enhancing the quantity (of water), even in challenging economic times. With changes in water use and demand in the “New West” (Riebsame, 1997), pressures are increasing on water resources due to increases in urban populations, recreational tourism, and traditional activities like ranching and irrigation. Some of the pressures also take the form of maintaining “instream” flows in place for ecology and related social benefits. The doctrine of “prior appropriation”<sup>10</sup> did not historically recognize “instream” flows as beneficial. However, in the twentieth century, the policy changed to recognize social and economic benefits.

The Department of Ecology (DOE) can only issue a permit for a water right when the following four conditions are met: (1) water is available, (2) the intended use is beneficial, (3) the right will not impair existing water rights, and (4) the public

interest will not be harmed (NRC, 2004).

The public interest criteria is reinforced by Washington State statute [Washington Code of Regulations 90.54.020(3) (a)].

*Perennial rivers and streams of the states shall be retained with base flows necessary to provide for preservation of wildlife, fish, scenic, aesthetic and other environmental values and navigation values.... Withdrawal of water which will conflict therewith shall be authorized in only those citations where it is clear that overriding considerations of public interest will be served.*

Although the state recognizes “instream” flows rights, these rights are “subordinate to any water withdrawal at the request of the U.S. Bureau of Reclamation for complete development of the Columbia Basin Project” (NRC, 2004, pp. 137). Instream flow rights are also subordinate to any federal agency or tribal reserved water right established before 1980.

Thus, these earlier rights and additional water withdrawn for the Columbia Basin Project are essentially senior to instream flow rights and referred to as “uninterrupted rights.” Although the advantage of uninterrupted rights is to provide greater certainty of water supply, it remains unclear how the State of Washington can control developments in Canada, other states or Indian reservations and restrict other demands of the river unless base flows for salmon are diminished. If these uses significantly reduce the instream flows, the guaranteed uninterrupted rights may potentially compromise some of the water

necessary for healthy aquatic habitat and fisheries (NRC, 2004).

Surface waters in Washington State belong to the public, and cannot be owned by any individual or group. Instead, individuals or groups may be granted rights of use by the DOE. A water right is a legal authorization to use a predefined quantity of public water for a designated purpose. This purpose must qualify as a “beneficial use.” Beneficial use involves the application of a reasonable quantity of water to a non-wasteful use, such as irrigation, domestic water supply, or power generation, to name a few (NRC, 2004). Water right applications for public health and safety projects and for projects that benefit the environment will get priority. The economic recession and the downturn in Washington’s General Fund revenues have meant significant reductions in Ecology’s work to protect the environment and public health, and to promote sustainable economic development (DOE, 2011).

The state acknowledges the vulnerability of surface waters to climate change and claims that it is making the necessary provision to mitigate the impacts of these changes on water resources, fish and wildlife. It has been funding several studies and would like to base its water rights decisions on scientific evidence provided from this research. Washington passed a law in 2006 that directs DOE to aggressively pursue new water diversions and find more opportunities to keep more water in the river for fish. The state has also taken major steps to implement the Columbia River Management Act (DOE, 2010).

### **5.1.1 Water Quality**

Ecology’s water programs work closely with Washington communities to protect and improve

water quality. They also ensure that the state has adequate and clean water supplies to meet current and future drinking water needs, commercial and agricultural uses, and sustain fish and the natural environment. Ecology embraces local partnerships and citizen involvement in its efforts to ensure a water smart future in the 21st century. The goal of pollution prevention, pollution clean-up and support for a healthy community is another task that the DOE claims to take up with a lot of vigour.

In accordance with the Federal Clean Water Act, Ecology develops a Total Daily Maximum Load (TMDL) for various indicators of water quality. It is through TMDLs that water impairment from dissolved oxygen, phosphorous, and fecal coliform bacteria is assessed and actions taken (DOE, 2011). There are many habitat restoration projects taking place in IMP watersheds. All state agencies collaborate with local watershed groups, special interests group and non-profit organizations to protect water quality and to balance competing uses of water and their impacts. Decisions of the State of Washington regarding the grant of permits must be balanced with the state's obligation to protect and enhance environmental quality, including salmon habitat.

### **5.1.2 Stakeholder Participation**

DOE encourages participation of all stakeholders in any water policy and management decision. Any consultation on water management decisions represents a policy instrument that is constructed as “state-owned” and relies on a foundation of consultation between the government and civil society. This process is perceived as offering an opportunity for a range of actors to engage legitimately in policy formulation.

## **5.2 Local Governments**

### **5.2.1 Spokane County**

#### ***5.2.1a Spokane County and its relationship to the river***

The County is one of the dischargers into the Spokane River, making it even more responsible towards water quality. The County recognizes that the aquifer and the river flow in and out of each other and has been continuously working towards public education on the river-aquifer interflow. The County strongly believes in the integrated nature of water resources and prefers to do integrated watershed planning with neighbouring states. It accepts the role of science to quantify resource issues and applies that science towards decisions about the river and aquifer.

The County finds itself in a leadership position to do a cross-state analysis for water consumption patterns. It is also working to apply this analysis toward land use decisions. Spokane doubles its water consumption in summer over the rest of the year. Considering this, the County is working toward removing uncertainty amongst people that there is enough water, and offers incentive programs for conserving water. The County's water resources program protects both surface water and ground water resources.

#### ***5.2.1b Stakeholder participation***

The County encourages stakeholder participation on all important water issues. The County negotiated with Avista during the relicensing process about restoring flows to protect aquatic life and help with temperature and phosphorus challenges. The County shares an open and transparent relationship with the Spokane Tribe, but since tribes have a protocol as a sovereign nation they speak only to federal representatives on issues of local government. The tribal representatives are invited to all meetings of the County but they are quiet listeners, as they deal only with the EPA.

#### ***5.2.1c Water quality***

The County, in partnership with other agencies, has formed a task force to conduct research on the bioavailability of phosphorous sources in the Spokane watershed. According to the County representative, Long Lake had more algal blooms about 30 years ago that contributed to dissolved oxygen depletion during critical conditions in the river and lake. Over the years, algal blooms are much less pronounced, except in the summer when water flow is at its lowest. County officials also contend that there has been tremendous clean up, especially in lower reaches of the river, though there is always room for improvement.

Still, the county recognizes that current water quality conditions in portions of the Spokane River watershed do not meet Washington State and tribal standards during all times of the year. Specifically, dissolved oxygen levels in Lake Spokane (Long Lake) are seasonally impaired because of excessive nutrient loading, particularly total phosphorus, which facilitates aquatic growth and decay. To bring dissolved oxygen conditions into compliance with State standards, nutrients delivered from the Spokane River watershed need to be reduced.

Reductions in both point and nonpoint source phosphorus are necessary to improve water quality conditions. One of the first steps taken by the County has been the removal of septic tanks to eliminate bio nutrients. In 1980, the County began a program to eliminate septic tanks and connect customers to the County's sewer system to protect the Spokane Aquifer. Since the program began, over 20,000 customers have connected. By 2015, it is expected that approximately 11,700 additional existing septic tank customers will connect to the sewer system. This sewer expansion program is projected to continue through the year 2015 to provide wastewater service to all existing development within the

County's sewer service area (Spokane County Executive Summary, 2007, pp. 1).

The nonpoint source load accounts for a large portion of the overall load, and the County has worked towards forming a task force to identify the nonpoint sources of phosphorous pollution because the point sources have already been identified in dischargers (municipal and industrial) to the Spokane River. General nonpoint sources are tributaries such as Hangman Creek, Coulee Creek, and the Little Spokane River; groundwater inflow to the main stem of the Spokane River; groundwater and runoff from the watershed immediately adjacent to Lake Spokane; and storm water discharging to the Spokane River, especially during the spring months. The task force's job has been to try to quantify these phosphorous contributions to the river.

The County's wastewater comes from various sources that include sinks, showers, toilets, washing machines and business and industries. Currently, all wastewater goes to the City of Spokane's wastewater treatment facility.

*"In 2010, the Washington State Department of Ecology and the Federal Environmental Protection Agency approved a cleanup plan for the Spokane River that focuses on removing phosphorus. This plan requires all of the existing treatment plants and the new Spokane County plant to remove more than 99 percent of the phosphorus from the sewage. There has been much discussion about whether this facility will contribute additional pollution to the Spokane River or will be a part of the solution in cleaning up the river. County officials contended that, contrary to the Sierra Club and the environmental community, Spokane County would be an important part of the regional efforts to reduce pollution in the Spokane River" (Rawl, 2011).*

Although the plant is not designed to remove PCBs, intensive research and simulations show that 80% more PCBs will be removed than if the sewage continued to flow to the City's current wastewater treatment plant. The County has been concerned about PCBs and has supported all remedial action. The County will work toward locating the PCB sources in its sewer system and to further reduce PCBs. The County has spent over \$450 million on wastewater projects to protect water quality in both the Spokane Valley-Rathdrum Prairie Aquifer and the Spokane River.

#### **5.2.1d The County's relationship to other agencies**

One of the challenges the County faces is the overlap of regulatory agencies in a watershed. For example, problems arose when the federal agencies insisted on modeling the eastern portions of Eastern Washington/Idaho basin as one and the basin from the Washington/Idaho state line as another. It took six years for the County to convince them to agree to do an integrated watershed model. The County has to also deal with the different water standards between the two states of its watershed. Further, it has to take into consideration the tribes who are sovereigns and have stricter downstream standards. Legal challenges exist and their complexity is immense. The County also argues that Washington standards are very high and sometimes difficult to meet compared to any other state in the country. County officials also feel that tribes have unachievable standards with any technology that exists today, as their standards come through mathematical modeling. The County is working with the DOE about a standard that the County feels that no one in the U.S. has met with the technology available. Therefore, it has negotiated with Ecology on a shared risk model where the County invests the resources to upgrade technology but it may or may not be able to meet standards that DOE is not ready to change.

## **5.2.2 Spokane City**

### ***5.2.2a Spokane City and its relationship to the Spokane River***

The City of Spokane also accepts that there is an interface between the river and the Spokane Valley Rathdrum Aquifer. The City has published educational tools and its support staff members interact with the community to educate them and gain an understanding of water resources within Spokane. The City also takes practical measures like having an aquifer protection zone, preventing any further development that could cause contamination. The City also protects its own wellheads. The City remains concerned about the oil pipeline that passes over the aquifer but has very limited authority over it. The City can only exercise authority through a third party to verify the pipeline's compliance through a franchise agreement to cross the City of Spokane, as the Federal law does not permit the City to enforce its own safety requirements.

The City recognizes that the river has multiple uses and is important from economic, environmental and utilitarian perspectives. While maintaining the utilitarian view of the Spokane River, the City emphasizes that it manages other aspects of the river very efficiently, from its beauty, to wildlife, parks, land use planning, and water quality. A major goal of the City is to clean up the river. "The City recognizes the challenges because the river was used as an industrial conduit for a couple of centuries without attribution to the cost. It was free disposing waste, and the cost was not accounted for as a business expense. Today, we are faced with tremendous costs of clean up all of all that waste and change land use patterns, industrial processes, and human behaviour, especially at a time when we are feeling the pinch of the economy" (City Representative Key Informant Interview, 2011).

### ***5.2.2b. Water quality***

As a step towards meeting water quality in the river, the City is working on a long-term plan for cleaning the river. It recognizes the TMDL challenges in dissolved oxygen and other contaminants, even though the costs of enforcement are huge; the financial reality juxtaposed with recession makes it more difficult for the City to impose a financial burden on the taxpayer. Apart from the financial costs, the City also faces challenges of competing environmental agencies who take a more bounded position of the river across state boundaries.

PCB levels in the Spokane River increase in successive reaches of the river from the Idaho border downstream to Long Lake Dam at the southern end of Lake Spokane (DOE, 2011). The City of Spokane's loading of PCBs comes 44% through storm water (Serdar, Lubliner, Johnson & Norton, 2011). The City has also made efforts to control storm water under the Combined Stormwater Overflow reduction program (CSO). The intent is to reduce untreated overflows to the Spokane River from the combined sewer system (which carry sanitary and storm water runoff in a single pipe). This is being accomplished through projects which aim to decrease the number of overflows to one per year and meet the state's water quality standards.

Major capital improvements at the City's water reclamation facility have been on-going since 1996, and the City is installing new sewer and pipelines while using the old ones to direct reclaimed water to fire hydrants and irrigation. Additional modifications and upgrades will be completed as necessary to ensure that the facility's discharge continues to meet state water quality standards. The city uses aluminum sulfate to reduce the amount of phosphorus its treatment plant discharges to the river during the algae growing season in Long Lake. About 90% of the phosphorus entering the plant is removed there.

Another step that the City has taken is to ensure that all septic tanks are connected to the sewer systems. The City believes that there are still about 250 tanks that are not connected, as they are in locations not easily accessible to the sewer system but do not threaten the aquifer.

### **5.2.3 Relationship with other Stakeholders**

The City of Spokane works in cooperation with other entities discharging to the Spokane River to control the total amount of phosphorus. It encourages continuous stakeholder participation and engagement in policy issues related to water. It is a member of the Joint Aquifer Protection Board. It also participates in the regional watershed management program, where it works to control point and nonpoint sources of pollution. In this process, it also communicates with other irrigation districts and water purveyors. The City also participates regularly in the Spokane River Forum. Although the political outlooks in Idaho and Washington are different, the city still makes an effort to engage with other state agencies in spite of their competing views.

## **5.3 Upper Columbia United Tribes**

Following western water law of “first in line, first in rights,” the UCUT tribes are important players in water resource development and management. The “winter’s doctrine”<sup>11</sup> guarantees tribal water rights, which are senior to other stakeholder rights. Water has a spiritual, medicinal and economic value to the tribes. UCUT communicates and resolves issues of common interest among member tribes through communication and collaboration. However, once a decision is taken over the issue, it is advocated with federal, state and local bodies and with other tribes to ensure that interests of the member tribes are recognized around issues of the management of Columbia River. UCUT operates through empowerment, cultural promotion, and takes advocacy actions as a non-profit organization. UCUT has one

commissioner and one representative of each of the five tribes to plan and takes up action programs that stimulate cooperative management of the resources, their conservation and enhancement. UCUT works to promote healthy traditional lands for present and future generations. Based on the interviews conducted, the following section describes the perceptions of some of the member tribes on water issues specific to the tribes in the Intermountain Province.

### **5.3.1 Colville Tribe and the relationship with the rivers**

The tribes share a cultural relationship with the rivers. A tribal member said, “Critically speaking, everything is about the river. The river defines who we are, as waters of these rivers are most sacred of all the elements on earth and used in our ceremonies and many ways of life” (Tribal Member Key Informant Interview, 2010). To almost all indigenous tribes, water is the lifeblood of this earth and remains a survival issue, both for water to drink and to protect habitat. The water to them is known in different forms and each spring has different qualities that non-Native Americans do not know. From the canoes of the river, to its medicinal, spiritual and shamanistic elements and the preservation of meats and fish for the winter, tribal societies respect and revere water as an integral element of life. As a Colville tribal member remarked “our belief system is centred on the power of the resources that the mother earth provides.”

#### **5.3.1a Water quality**

The Confederated Tribes of the Colville have their own standards that they would like to see implemented in the Upper Columbia River. In the Okanogan River watershed where some Colville’s reside, members face contamination and water quality problems due to multilayered jurisdictions of transboundary water flows in the region. The watersheds originate in Canada and as water flows

south, the tribes have been suffering from contamination of Canadian industries for about one hundred years. These industries included mining, milling, smelting operations, and pulp and paper facilities.

Even in the current era, the tribes face water pollution challenges from major pulp industries across the border, as well as effluents released from Teck Resources Ltd., a Canadian company whose century-old lead smelter in Trail, B.C., discharged millions of tons of industrial waste into the Columbia River. These releases continued until the mid-1990s. The Confederation is engaged in major litigation against the company for its liability to clean up the site. The State of Washington is a party to the suit, which contends that Teck is responsible for hazardous releases from the smelter into the Upper Columbia. PCBs, dioxin, lead, zinc, copper, cadmium and mercury are some of the major pollutants found in the watershed. A tribal member argued that state and federal standards were enforced at the border, but they remain violated on the Canadian side, leading to super saturation of pollutants in water and a high flow of intense nitrogen that kills resident fish.

In other instances, fish, such as suckers, were found contaminated with pollutants. Suckers, once part of the traditional diet of tribes, were found positive for many contaminants that ranged from mercury, lead, arsenic, PCBs and others (Kramer, 2010). The pesticide risk has increased in the Upper Columbia Basin due to an increase in the size of orchards and increased pesticides used and washed out with irrigation. In the Spokane River, municipal wastes have also been identified. Thus, there are many complex problems in the Upper Columbia watershed.

The tribes believe that water quality has strong effects on aquatic biota. The Federated Tribes of the Colville petitioned the EPA in 1999 to conduct

a study assessing environmental contamination in the Upper Columbia, to remedy concerns about risk to human health and the environment. This study is currently funded by Teck Cominco. The results of preliminary data from the EPA (2001) showed that contamination exists in the sediment of Lake Roosevelt, but further studies are needed for definitive answers on risks to human health, fish as food and recreational use of the beaches (UCRP, 2011). The answers are years ahead, (Botttcher, 2010) and the tribes struggle to deal with the Basin's watersheds, especially the Okanogan River watershed, where problems of water temperature and water quality consistently exist (Tribal Member Key Informant Interview, 2010).

### **5.3.1b Fish and habitat**

Salmon is the key symbol and identity of the tribes. As a tribal member remarked, "To the tribes, the river and the fish are an integral part of who we are as people. Our place holds our stories and history of how we followed the fish up and down the season and our people relied on that" (Tribal Member Key Informant Interview, 2010). Fish is no longer an economic driver for the tribes, yet its value as a subsistence food and cultural resource exists. Historically, the majority of the salmon spawning occurred in the Upper Columbia River above the Grand Coulee Dam but access to that area was blocked with the construction of the dam. The runs of fish have declined in the years following the hydropower system development. Chinook salmon and steelhead are listed in the Endangered Species Act. Several recovery plans have been put into operation, and as another tribal member remarked, "As part of our coyote story, we are preparing for the salmon to come back to the system. That is our goal."

Washington Department of Fish and Wildlife is implementing these recoveries and funds have been made available to the tribes for the same.

The Confederated Tribes continue their efforts to bring salmon back. At the Okanogan River, tribal members fish for salmon but the fishery is diminishing. Instream flows in the Okanogan River are a key challenge for the tribes. The Colvilles envision that the salmon should be able to come from the Grand Coulee and the Chief Joseph Dams up to the reservation instead of trucking them up and transferring them to the Upper Columbia. Until this happens, the tribes have built hatcheries that provide resident fish many benefits and improve the watershed. The desire for a clean water homeland and fish celebrations for the return of the fish is the main environmental goal of the tribes.

### ***5.3.1c Relationship with the Department of Ecology***

The tribes have an “odd relationship” with state agencies. Perceptions of the Colvilles about the role played by state agencies were both cooperative and contested. The tribes expressed that there existed a world of difference between the tribes and how the state addresses water quality through its process of TMDLs. The tribes contest the way the state implements the standards where irrigation interests fuel politics. The state’s “complicit” acceptance of low standards led a tribal member to remark, “The way DOE addresses water quality in the Basin has implications on river ecological system. They do not solve the problem, as the bar is so low that the tribal standards will never be achieved” (Tribal Member Key Informant Interview, 2010). On the other hand, the tribe also appreciates the way the DOE joined hands with the tribes against the lawsuit on Teck Cominco to mitigate some of the damage done by the company in compromising water quality standards. Ecology also has some productive, issue based partnerships on water quality.

Another aspect of the DOE relationship with the tribes relates to differences in perception about

the availability of water in the rivers and streams. The Colvilles believe that the state needs to tell its citizens that there is no further water in the system, and argues that the DOE actually tries to get new permits issued for these stakeholders in irrigation and business practices based on a biased vision of unlimited supply.

### **5.3.2 The Kalispel Tribe and its Relationship with the Rivers**

To the Kalispel Tribe, water is of great importance. Even before they settled around the Pend Oreille River, they were known as the “water people.” The river continues to be very important to the culture of the Tribe. They have been using the Clark Fork and the Pend Oreille for a long time for fishing, hunting, gathering, and religious and social ceremonies. Preserving, restoring and enhancing the surface and ground water of the reservation are of prime importance to the Tribe (Kalispel, 2011). They used ground and surface water daily for commerce and social functions. The Kalispel were known for the sturgeon-looking canoes and their ability to live dexterously on water and land.

#### ***5.3.2a Water quality***

While the tribal members still use the water, they view its quality as impaired. The Kalispels think dams are affecting water quality profoundly, impacting fish. When water temperatures are too high, the water is uninhabitable for fish and other aquatic animals. Many salmon and trout species will suffer a variety of ill effects, ranging from decreased spawning success to death. The optimal temperature for most salmon and trout species is between 12-14°C (54-57°F), and temperatures in the range of 23-25°C (73-77° F) can be lethal, depending on the species (DOE, 2011). “As temperature warms up, aquatic weeds alter habitat ecology and reduce the velocity of water moving into the system. The movement of water is seasonal. There is 100,000 cubic feet per second water during spring and summer but when it is



shut down, the flowing river becomes a slow moving lake. This changes the whole chemistry and ecology of the system” (Tribal Member Key Informant Interview, 2010).

Another concern amongst the Tribe is the total dissolved gas, or air that is trapped in water because of waterfalls or water plunging over a dam. When rivers have excess total dissolved gas, the gas can form bubbles inside the fish, often in the eyes or near fins. This condition is known as gas bubble disease and can be fatal. Chemicals such as Aldrin and PCBs also can build up in fish. If the level of chemicals in the fish is high enough, it can become unsafe for people to eat a large amount of these fish. Although the WRIA 62 report covering the Pend Oreille River considers the quality good, the tribes argue that sedimentation, dissolved oxygen, phosphorous, fecal coliform bacteria in the Pend Oreille River negatively affect the aquatic habitat.

### **5.3.2b Fish and habitat**

The salmon and the diverse resident fish had both ecological and economic value to the tribe. The Tribe reported that the resident fish population has been harmed by habitat destruction and the alteration of the ecosystem by hydroelectric dams. Although these tribes are left with no salmon today, they were salmon people. Today, the bull trout fills this niche.

Due to warmer water temperatures, however, the bull trout catch has declined in spite of traps to catch them. Dams, like the Box Canyon, have mitigation provisions. “USACE is also supposed to mitigate the fish impact by constructing fish passage. Similar arrangements are supposed to be constructed at the Boundary Dam that is owned by the City of Seattle. However, for complete mitigation of problems of water temperature at the Box Canyon Dam, the reservoir needs to be made smaller, which would mean less electricity

and spill” (Tribal Member Key Informant Interview, 2010). In an effort to keep the fish population stable, the tribes have been trying to fix historic impacts by restoring shoreline with vegetation like trees, as the river gets too hot for the bull trout. Bull trout go to the cooler creeks and streams to spawn. Efforts are being made to restore the genetic pool that drove the process of migration of the fish. However, that has been a very difficult task. As a result, the Fish and Game Department of the state of Washington has introduced non-native species.

Several factors drove the decision of having warm water, non-native species introduced in the river. These species live in warm water and are more aggressive. Due to degraded watersheds from logging, state agencies looked for species that survive in these conditions. The introduction of non-native species was ideal as they out-compete cutthroat and interbreeds with bull trout (Tribal Member Key Informant Interview, 2010). Hatcheries funded with the help of BPA now support largemouth and smallmouth bass and northern pike populations. The state of Washington recognizes the Kalispel Natural Resources Department (KNRD) as a co-manager for the Pend Oreille River watershed area. KNRD also manages the only warm water hatchery for the largemouth bass in the region.

One of the major challenges the Tribe faces is to establish thriving native fisheries for some of the best-known trout species in the tributaries of the Pend Oreille River. The goal is not just to preserve museum specimens but to conserve them for sport and food. “Even if cutthroat or bull trout remain scarce in our fishing nets, their presence in waters will be an achievement. There are challenges for discontinuing past bad practices that have been mutilating the environment, but lessons from mistakes can be learned to cleanse waters from pollution, maintain enough flows in our creeks, streams and rivers and restore

wonderful cold and clean waters to allow cold water fish to inhabit the river” (Tribal Member Key Informant Interview, 2010).

### ***5.3.2c Relationship with the Department of Ecology and USACE***

The Kalispel Tribe shares a similar relationship with the state as the Confederated Tribes of the Colvilles do. On the one hand, they are co-managers of the warm water hatchery and work in collaboration with the State. As sovereigns, they have their own water quality standards and remedial measures. At the outset, they adopt a collaborative approach with the state agencies, working closely on recovery and mitigation projects in the sub-basin. The tribes also agree that the state invites them to the stakeholder meetings for joint decision-making but as tribal representatives remarked, “not all stakeholders are equal in the eyes.” According to some others “there are already foregone conclusions leading to failed interactions” (Tribal Member Key Informant Interview, 2010).

Like the Colville Tribes, the Kalispel also claim that state agencies value some stakeholders more than the others. For example, said a tribal representative, “The Pend Oreille Public Utility District sold 50,000 acre feet to the Columbia River Initiative to grow more potatoes in Moses Lake. Irrigators do not pay for that water, as irrigation is subsidized.” The tribes claim that the DOE will be catering to apple and potato growers to serve special interests and will also take water from Lake Pend Oreille to recharge the Rathdrum Prairie-Spokane Valley Aquifer.

In another example of differences in perceptions, the Kalispel claim, “The Pend Oreille River is regulated by the Albeni Dams, which is a USACE operation, and the agency has operation principles that they abide for regulatory control of the River. They can stop the water at 5,000 cubic

feet per second; that is a lot of water in general, but compared to the river, it is not very much and only half of what the Pend Oreille River has in the summer flow. It could be enough if it occurred at the right time of the year to help water quality. However, they shut it down at the hottest time of the year so there is not much flow, which allows the river to get warmer, and limits the use of bull trout and cold-water fish. There should be more water flow in the river during critical periods” (Tribal Member Key Informant Interview, 2010).

The Kalispel also claimed that there are areas where the relationship between the state agencies and the tribes turns adversarial rather than cooperative, depending on the issue. For example in the area of water quality, the Tribe claims that the DOE likes to ignore water quality issues by “doing their math differently.” The Kalispels have a hard time convincing the DOE to address challenges under the Federal Clean Water Act to mitigate the impact dams on reservoir temperature, macrophytes and impact on water quality. The Tribe also has its own water quality standards that are more restrictive. With the help of EPA funding, it regulates the shoreline while the DOE regulates the main volume of water. The tribe asserts that the DOE does not pay much attention to legislation like the Federal Clean Water Act. Further, the EPA has not taken a leadership role in trans-boundary matters. The Tribe claims that the DOE remains complacent about issues facing native species of fish in the face of hydropower production.

In essence, the Tribe claims “that although the people can physically access the river and there may be enough water for the homeland, more value for economic gain is attached to the river by using it elsewhere rather than leaving the river for habitat and cultural relationships” (Tribal Member Key Informant Interview, 2010). The willingness to give in to economic and political interests risks the natural environment, as the economic gains made

with the utilization of the resource are not given back to the environment in a manner that would keep the resource sustainable and healthy.

The Tribe also argues that as demands for water grow, they will have to be more vocal about preserving their interests with state agencies. Institutions like the BPA are considering winter lake variability that can raise or lower the lake to supply water to the Columbia River, and meet certain river level requirements for salmon flows, but the tribe contests this. It asks, “Will the Pend Oreille River be used to mitigate everybody else’s problem rather than leave water for us? We cannot let the state agencies further disenfranchise the tribes from their resources and create a distance between the tribe and the River” (Tribal Member Key Informant Interview, 2010).

### **5.3.3 The Spokane Tribe and its Relationship with the Rivers**

For the Spokane Tribe, the Spokane River is their identity and their culture, and served as the source of food for centuries. The River has been “a pathway of life for many, many generations,” according to tribal publications. Members of the tribe have relied on the river for nourishment, medicinal, and spiritual purposes. Spokane Falls was a place for tribal members to gather with family and friends. The Spokane River and the Spokane Falls are in the heart of the ancestral homelands of the tribe (NWPC, 2010).

#### **5.3.3a Water quality**

The Spokane Tribe has had stringent water quality standards for generations. The Tribe remains concerned about the Spokane’s nutrient input load of wastewater plants, causing low oxygen in river. “What used to be river is now reservoir and we have very little area to grow fish, as the temperature is warm and dams have changed the environment” (Tribal Member Key Informant Interview, 2010). Dam spillways create super

saturated gas that kills fish. The Tribe still suffers from the past mining practices, as lead, cadmium and mercury are still seeping into the water through the dredging of the Lake Coeur d’Alene. High levels of chemicals and PCB are detected in the water of the tribal reservation. Other major pollutants are phosphorus, algal blooms and toxic sediment bands.

The Tribe is alarmed at the total dissolved gas (TGD) in Lake Roosevelt, where TGD exceeds 110% of its threshold about five to six months of the year. “Through the water quality standards, the Tribe has been engaged in Silver Valley Mining Reclamation and the Columbia River TMDL discussions and in FERC relicensing of the dams on the Spokane River. (Tribal Member Key Informant Interview, 2010).The tribal representative also claimed that the DOE and the EPA focus only on point sources of pollution while non-point sources remain poorly regulated. “The DOE is aware of it but cannot compel farmers to change practices, as it does not make economic sense to them. However, if Avista, Kaiser or Inland Empire came in and agreed to buy the crops of that area every year, then they would probably agree to reduce the nutrient load.”

#### **5.3.3b Fish and habitat**

Among the tribes in the IMP, the Spokane Tribe has been the most documented for its historical salmon consumption of up to 2 pounds a day. The tribes have not given up their practice of consuming fish but the fish need to be clean before consumption. Historically, the Spokane Tribe dried around 40,000 fish annually and sometimes traded seven to eight hundred salmon a day. While the Spokane River no longer supplies significant quantities of water for drinking and irrigation, the tribes recognize the value other beneficial uses of the river, such as recreation, sports, fishing as well as habitat protection.

Water quality issues present new challenges. Since the construction of dams on the Spokane River, the quality and quantity of fish declined. Avista and BPA have agreed to fund mitigation of these adverse impacts. Due to the loss of fish, the Washington Department of Fish and Wildlife run a hatchery with tribal collaboration. A federal hatchery grows salmon, red band trout and suckerfish for the Spokane Tribe. The Tribe is concerned about the contaminants in trout and bass from mercury. Mountain fish and sucker species have high lipid content so they are more vulnerable to hold PCBs. The Tribe does not fish in the Blue Creek watershed because of the pollution from the nearby uranium mine. There has been a decline in the white sturgeon that provided regional biodiversity and a cultural keystone for the tribes. A catch-and-release white sturgeon fishery monitors and conserves the fish to ensure continuation of the population. American and Canadian partners, BPA, Colville Confederated Tribes, Spokane Tribe of Indians, Teck Cominco Metals Ltd, non-profit organizations and the U.S. Fish and Wildlife Service support this fishery.

Walleye fishing is very common in Lake Roosevelt. While the walleye are not originally native to Washington, they are a popular sport for anglers. State licenses are required for all non-tribal members fishing in the lake, but the Tribe issues licenses to those wanting to fish on its lands. The Spokanes differ with the State on walleye fishing in Lake Roosevelt. While the tribe wants to limit walleye fishing, non-tribal members want to increase this fishery, and the granting of license permits by Washington State reflects “the political side of the State in walleye.”

### **5.3.3c Relationship with the DOE and EPA**

The Spokane Tribe mentioned that they and the DOE had some converging perspective in water quality and seem to have a fair working relationship in water management. The Tribe mentioned, however, that they had stringent and

higher standards of water quality than DOE, demanding that as water comes into the reservation, it has to meet reservation standards. They collaborate with the EPA and Ecology for TMDLs but remain concerned by the lack of stringent action by these agencies on non-point sources of pollution due to political pressure.

### **5.3.4 Commonalities in the UCUT**

The three tribes interviewed maintain a consensus about the collaborative and contested relationship with the state agencies about water quality in the rivers of this region. The tribes are also concerned about the lack of a fully articulated ecosystem perspective for the rivers, as they believe that state agencies emphasize the economic value of the water. The tribes believe that they are distanced from the river for two reasons: (1) water quality degradation, and (2) a series of reservoirs that have an operational and secondary impact on the fish and habitat of the region. They also were concerned about the impact of climate change.

## **5.4 Non-Governmental Organizations in the Intermountain Province**

A host of non-profit organizations work in the IMP and there are dozens of groups in Washington State that act as policy advocates and educational proponents for the conservation and restoration of the natural environment in the IMP. These actors work to influence and shape policy processes, creating new “policy spaces” for the engagement of those aspects that are marginalized or excluded from governmental policy deliberations. Policy spaces are moments of intervention or events that bring new opportunities to reconfigure relationships between these civil society groups and state agencies to open up possibilities for a shift in

direction (Asthana, 2009). An analysis of these spaces can help understand the dynamics and development of alternative narratives to the mainstream agenda of the state agencies.

Some of the ways in which these civil society actors articulate alternative views on river water policies in the IMP takes place through alliances and coalitions that work to advocate, reform, educate and sponsor public interest litigation for sustainability of the river systems. Not all non-profit organizations are alike. The DOE has secured the agreement of some while there are other organizations that operate on a different spectrum. This section reviews some of the claims made by advocacy organizations on their relationship to the IMP rivers, water quality, perceptions about state agencies and fish and habitat. This intersection between these non-profit groups and the state agencies becomes an important space for engagement to discuss matters of mutual interest and, where possible, to reach a common judgment to act for policy change in the Intermountain Province.

#### **5.4.1 Perceptions about the rivers and water resources**

Most of these organizations perceive the river sub-basins as fascinating for their hydrology, culture, transnational issues, and multiple sovereigns. A CELP member described the Columbia River as a river of superlatives," but one that is enduring the effects of the hydropower legacy and other agricultural and industrial impacts" (CELP Key Informant Interview, 2010). Groups agree that there has been a massive alteration in not only the main stem Columbia but weeds in the drier parts of the river basin and loss of fish. The transportation and electric grids have affected both terrestrial and avian wildlife. Critters lived in the warm areas have now been limited to higher altitudes" (Lands Council Key Informant Interview, 2010).

There is a consensus amongst these organizations that the identity of the IMP, with mountains, falling waters, paddles and fish, is at stake with the rationalization of these rivers. Dams and diversions of water for agriculture and municipalities have created a different landscape. IMP rivers have been harnessed for hydropower, leading to an overtaxing of their systems. The Pend Oreille River is perceived as a resource available to mitigate problems in water-short areas. Advocacy groups believe "that drawing water from the River for storage in the aquifer to support subsidized irrigation and municipalities actually competes with conservation easements in those lands and wildlife." The groups contest the further rationalization of an already "federalized river" and current initiatives to draw more water from the River. Although the state has been addressing these issues, there remain challenges in water quality, loss of the salmon and critical habitat, and an absence of a restoration model to make these rivers sustainable. All the groups interviewed expressed concern over climate variability in the region and the impact it will have on water resources.

#### **5.4.2 Water Quality**

Interviewed groups revealed that there is an enormous amount of agency activity around water quality problems but the outcomes do not match promises made. The State has its water quality standards and water quality is, on average, found to be good. The groups claimed that while Washington State does not have degraded rivers everywhere, per the Federal Water Quality Act, the State has to acknowledge the degradation of a river and ameliorate it via TMDL limits. But the implementation of the process has not been particularly effective.

About 80,000 chemicals are used in day-to-day life. Until they are proven harmful for life, they remain in use and pose concern to water quality.

“There are certain manmade chemicals that are non-degradable for long spans of time and known for harmful impacts, such as PCBs. It is known that 55% of PCBs enter Spokane River through the combined sewer overflow and storm water, 25% at the Idaho border, 15% from industrial and wastewater treatment discharge and 5% from the Little Spokane River. PBDEs, a new generation of flame-retardants like dioxins/furans, are mostly produced as a by-product of burning items such as municipal waste, sludge, medical waste and wool. They are also produced as a by-product in manufacture of herbicides, and pulp and paper” (Spokane River Forum, 2009). The Upper Columbia River Group has been negotiating with the DOE on issues of low dissolved oxygen levels caused by the presence of oxygen-consuming pollutants (biological oxygen demand, or BOD), phosphorous, and ammonia. These pollutants are discharged by various facilities along the river, including the City of Liberty Lake’s Wastewater Treatment Plant (WWTP), Inland Empire Paper, Kaiser Steel, and the City of Spokane’s WWTP, as well as the cities of Coeur d’Alene, Hayden and Post Falls (Upper Columbia River Group, 2010).

Similarly, the groups argue “the Columbia River is inundated with toxic threats of heavy metals, such as mercury, chromium, and lead; so-called “legacy pollutants,” such as PCB, DDT, and TCE that are leaching out from industrial sites; and “emerging pollutants.” The discharges of pharmaceuticals and endocrine disrupting chemicals are largely unregulated. The EPA released a report in January 2009 concluding that the Columbia River exceeds the safe level for PCBs, DDT, mercury, and flame-retardants. A previous EPA report showed that toxic concentrations in fish are so high in some sections of the Columbia that Native Americans now face a 1 in 50 risk of cancer just from eating Columbia River fish (Columbia River Keeper, 2010). “Efforts have been made to cleanse the river through a Teck Cominco grant under EPA supervision, but the answers to whether we can

eat the fish, swim in the river or walk on the beach still seem far away” (Spokesman Review, 2010).

While the groups conceded that the rivers’ water quality at different points and time was good, they also emphasized that the Upper Columbia, Spokane and Pend Oreille Rivers need clean up in certain stretches. The groups also claimed that there were challenges in mitigating these issues, as the toxic lists and standards were outdated, and enforcement is difficult.

#### **5.4.3 Relationship with the State**

According to the groups, not all state agencies are equal. Some departments like the DOE have more power over water resources, water quality and water rights. Others, like the Department of Fish and Wildlife, are less politically powerful and their recommendations are sometimes compromised.

In a general view of government agencies, the organizations believe that the pendulum of state agencies is swinging in favor of their willingness to facilitate increased use of water resources of the rivers. The federal perspective guiding water resource development focuses on a supply-based paradigm as the only alternative to meet water needs for such diverse purposes as irrigation, drinking water, industrial and energy. Groups claimed that the assumption in the Bureau of Reclamation and the Army Corps of Engineers is that “as long as there is a river and a valley that could build a dam there will always be enough water for sustainable development” (Lands Council Key Informant Interview, 2010). “The agencies have a very utilitarian view of water resources, although there is recognition amongst them of the value of maintaining fish populations. A great example of this vision is the building of great water intake structures in the State of Washington” (CELP Key Informant Interview, 2010).

The most controversial project of the state, the groups claimed, is the Weber Siphon project under I-90. Decades of irrigation and ground water pumping have depleted the Odessa Aquifer and the state needs to “bail out” farmers from a situation that might push them back into the dry land. The Columbia River Initiative was passed to address the plight of the potato-growing farmers pumping water from the Odessa aquifer. “The State, the Bureau, and the project irrigation districts signed a memorandum of understanding and a Columbia River Initiative was passed addressing the plight of farmers pumping fossil groundwater from the Odessa aquifer” (Chasan, 2011).

The Columbia River Basin Water Supply Act passed in 2006 set up allocation to “assess, plan, and develop new storage, improve or alter operations of existing storage facilities, implement conservation projects, or any other action designed to provide access to new water supplies within the Columbia River Basin for both in-stream and out-of-stream uses.” Giving special treatment to the Odessa Aquifer, the legislation says that the “Department of Ecology shall focus its efforts to develop water supplies for the Columbia River Basin on the alternatives to groundwater for agricultural users in the Odessa Sub area Aquifer” (Ibid, 2011). Opposition groups contend that this has been a deal brokered between the Bureau and irrigation district, which would supply and distribute water for irrigation. The Bureau would get the water by drawing down Lake Roosevelt.

This withdrawal has been contested by the Center for Environmental Law and Policy and the Columbia River Keeper on the grounds that the drawdown would expose some of the currently submerged residue of lead and mercury to air and wind. The groups have challenged this decision of Lake Roosevelt draw down in federal court, as the National Environmental Policy Act requires the Bureau to look at the cumulative impact of past

and foreseeable future water diversions, not just assess the planned drawdown in isolation. As Rachel Osborn of CELP said, “Economists, wildlife biologists, and lawyers have uniformly panned the Bureau's proposal as environmental damaging, fiscally irresponsible, and illegal.”

Groups were also concerned at the way the State approaches climate change. Pointing to a decline in the snow pack, rapid glacial melt and low aquifer recharge, the groups maintain that climate change is taking place. However, as a CELP representative claimed, “BUR (Reclamation) believes that due to the uncertainty in future precipitation patterns, the region may be better off, and based on this understanding, justify the expansion in the Lake Roosevelt and the Odessa Aquifer in environmental impact studies - the exact opposite of the precautionary principles.” The groups were concerned that if their understanding of climate change did not work, they will fail to make readjustments, as these would have a tremendous impact on communities and economic activities that have grown around irrigated water. Groups claimed that there may be uncertainty but the snowpack is going to melt, and the prediction that there may be more rain is not sufficient to make a determination of water use out of stream.

In terms of participation and consultation, “the State has a legal obligation to consult non-profits when doing environmental analysis to present to the public as an open process that could be implemented through consensus. In practice, their actions are different from the consultative process” (CELP Key Informant Interview, 2010). In another effort in participatory policy processes, some groups that were invited in the Spokane River Collaborative Effort on Dissolved Oxygen and TMDL revealed that “consultation” and “participation” was the dominant mode so that ideas of the civil society and stakeholders were solicited and inputs taken from the stakeholders.

“However, the ultimate outcome was different from the inputs during the collaborative meeting, in which conservation groups were not even invited to sign the final document, while the dischargers were invited to sign the agreement in what would seem a tacit understanding with Ecology and EPA” (Lands Council Key Informant Interview, 2010).

These experiences describe the boundaries of the space offered, and the key elements of the narratives of these stakeholders remain constrained (Collins, 2000). However, these NGOs do have opportunities to influence the framing of policy in invited spaces. Depending on the issue, they resort to negotiations or public interest litigation for redressing their concerns.

Non-profit groups also reported that depending on the issues, they work in close cooperation with state agencies’ habitat restoration efforts; but in other cases have to push for compliance as river keepers of the province. For example, the Lands Council works with the DOE on the Beavers Project. Beaver dams recharge the water and water tables will be higher leading to better aquatics and higher wetlands. On another occasion, the Lands Council challenged Pullman’s wastewater treatment plant when it exceeded pollution standards. According to the Council, political interests sometimes do not allow state agencies to push hard; therefore, outside organizations need to do this.

Another example was the dispute of the Sierra Club against Avista, over the diversion during the summer months of all the water at Spokane River falls for hydropower production. After Avista’s operating permit for the Upper Falls Dam was renewed, “the Sierra Club appealed against the permit under the Federal Clean Water Act, arguing that factors other than maximizing power generation needed to be taken into consideration” (Osborn, 2010). The settlement to keep the River

flowing year-round was a struggle of national significance because the legal basis of the Sierra Club’s appeal was that the Clean Water Act protects not just water quality, but also water quantity flowing in rivers and waterfalls. These kinds of successes in the process demonstrate the role of non-profit groups while dealing with state agencies.

#### **5.4.4 Fish and Habitat**

One of the major concerns about water quality among non-profit organizations in IMP relates to fish. Water pollution in certain stretches of the region’s rivers contributes to violation of the dissolved oxygen standard. Low dissolved oxygen levels adversely affect the ability of salmonids, including rainbow trout and mountain whitefish, to survive and thrive in the Spokane River. The Upper Columbia River Group has petitioned the DOE for collaborative programs to reduce the level of pollution. These activities are also part of the Lands Council’s larger, multi-year goal of building public awareness of the health risks of PCBs in Spokane River fish (Lands Council, 2010). Recreational anglers, who are the primary users of the Spokane River above the Long Lake Reservoir Dam, remain worried about fishing locations. Groups like the Lands Council and other groups for the Spokane River and Lake Roosevelt areas promote fish advisory awareness to protect the health of the communities in the region.

#### **5.5.1 Avista Utilities**

##### ***5.5.1a Avista’s relationship to the Spokane River***

The FERC license granted to Avista in 2009 spells out how they will operate over the next 50 years. The license gives as much importance to the environment as much as it does to power generation. Recreation also gets significant attention.



Avista expects to spend more than \$300 million to meet the new conditions set out in the license. Avista will spend nearly \$400,000 annually to add and upgrade recreational sites. Projects include new public access for boaters, including 10 boat-in only, semi-primitive campsites on Long Lake. Avista agreed to study better access to and amenities at the rapids that white water kayakers use below Post Falls Dam. Avista will survey bald eagles and prepare a plan to keep raptors from being hurt or killed on its transmission lines. As noted above, Avista will increase summer aesthetic flows over Spokane Falls. As part of the FERC license, the utility must also manage aquatic weeds on Long Lake and Lake Coeur d'Alene.

The company declares that it is a regulated utility whose rates are set by the Washington State Utility Commission because it does not sell power at a market price. The utility has a cost-based business model. All costs of environmental programs are part of the electricity and paid for by the consumer. Under the present license, customers will pay the cost over the next five decades. The company has a legal requirement to deliver electricity, and in addition, to recover costs and regulated profit.

#### **5.5.1b Water quality**

Avista's FERC license requires a certain level of water quality. The company admits that Dissolved Oxygen (DO) at Post Falls is an issue and it is looking at ways to reduce the current level. At Long Lake, there are also concerns about DO and its impact on the fish. The company mentions that most dams in the region have been built on natural waterfalls except at Long Lake. Total Dissolved Gas (TDG), therefore, is naturally created by these falls, except at Long Lake. Their challenge arises because DOE is not concerned whether the TDG levels have natural or unnatural causes; instead, its goal is to reduce TDG. Avista is working with the agency on how to reduce the

levels via modifications to operations so that standards are met. The company also works with DOE on TMDLs and nutrients. The tribes review all their documents and feasibility studies on TDG. High levels of DO and nutrients are not found upstream, but rather downstream from Long Lake.

The company has looked at different options and has even experimented with them because it would like to help in the areas of the reservoir and fish habitat. The TMDL water quality attainment plan looks at options of erosion control, habitat restoration, sediments, and fertilizers. The company has met with the local water conservation district to help with the programs. The company also argues that while the impression of water quality in Lake Spokane is bad, the water quality is much cleaner than other lakes and reservoirs in the region. It is a fishable and swimmable lake.

#### **5.5.1c Stakeholder participation**

Avista believes in consistent and continuous engagement with stakeholders. When it comes to licensing hydro facilities, Avista maintains that it was a stakeholder driven process. Based on the success of the Clark Fork River relicensing, where about 27 stakeholders were involved, Avista started the process of stakeholder engagement for the Spokane Hydroelectric Project licensing much earlier than was needed. It began in 1998-1999 and included tribes, local governments, state historic preservation offices, advisory councils and other interested stakeholders who wanted to engage with the licensing process. This process formed the basis of the 2001 stakeholder process, where 60-70 stakeholders participated in identifying issues and concerns about the project. Avista had technical groups and a facilitator where stakeholders voiced their concerns.

Even on the aesthetic consideration of the river, the aesthetic spill included in Avista's proposal

was voluntary; a work group of stakeholders was engaged to determine if implementation of aesthetic flow should be provided only when people would be likely to be there versus year-around. The conflict with the environmental groups was over the amount of flow. Two hundred cubic feet per second was proposed by the stakeholders, and “community considerations were accepted even though the company would lose power. But that was the balance that we were looking for” (Avista Key Informant Interview, 2011). Bruce Howard, Spokane River license manager for Avista Utilities commented that “the Spokane River runs right through the heart of the City [of Spokane], so public participation has always been an important part of the river management process.” The company also shares a good relationship with state agencies like DOE and Department of Environmental Quality (DEQ, Idaho) and works with all agencies at federal, state, and local levels. If there is a disagreement, and recommendations are denied, the company explains the rationale for it in a very extensive consultation process.

#### ***5.5.1d Relationship with the Tribes***

Avista has a relationship with seven tribes in the region. The tribes work on a sovereign to sovereign relationship so the Avista staff works with their technical group leaders and advisors. With the Coeur d’Alene Tribe, Avista mentioned that they do not have as much of a developed relationship. Due to the tensions between the state of Idaho government and the Tribe over the ownership of the Lake, Avista worked to facilitate a dialogue between them while maintaining a neutral stand during the U.S. Supreme Court case over the ownership of the Lake.

In June 2001, the Supreme Court awarded the Coeur d’Alene Tribe ownership of the southern one-third of the Lake. The Tribe remained concerned about the inundated areas of the

reservation and the impact on habitat, tribal land, water quality, fisheries, erosion and any liability issues of stored water for a hundred years on the reservation. Avista negotiated a deal with the Tribe to support the licensing process and agreed to pay more than \$150 million over the life of the deal to compensate the Tribe and to protect the environment of the Lake. “This agreement finally compensates the Tribe for Avista’s use of tribal lands to bring power generation to the region at the turn of the 20th century,” said Chief James Allan, Coeur d’Alene tribal chairman (Country News, 2008).

Avista also negotiated rights for transmission lines and future payments to store water in the Lake. The deal ensures that Avista pays for the past and future use of submerged tribal lands and for mitigation of the impacts of Post Falls Dam on the reservation. “The Tribe’s goal has been and continues to be to strike a balance between the health and well-being of the lake and the needs of the local and regional economy” (Country News, 2008). Avista also agreed to create a trust fund to deal with shoreline erosion, wetland restoration, water quality monitoring, weed management and protection of cultural resources. Avista will place \$100 million into this fund over the term of the license, and will seek to recover that money from ratepayers.

With the Spokane Tribe, Avista shares a good relationship, especially after the 1994 agreement over the Little Falls Dam, which is on tribal lands. Avista supplies them with electricity and negotiates rights over transmission lines. The only concern between the Tribe and Avista occurs over the poor water quality coming out of Long Lake and its potential impact for fish downstream.

#### ***5.5.1e Avista and fisheries***

The FERC license requires Avista to look at fisheries health, stocking and recreation. The

company has an annual fisheries program in Idaho; it is doing a ten-year population analysis for fisheries in the Spokane River. At the Nine Mile and Monroe Street facilities, the company will shift spring operations to enhance spawning. It will also take into consideration minimal flows based on fisheries. The company is also doing

fishery studies for stocking fish in Upper Falls, Nine Mile and Lake Spokane. The license also requires studies of bull trout, west-slope cutthroat and surveys of other fish on certain stretches of the river. Avista will stock 155,000 sterile rainbow trout in Long Lake each year for five years for recreational fishing, in collaboration with WDFW.

## 6. Discussion

The analysis of the cultural forces at work in the part of Intermountain Province taken up by Northeastern Washington presents an interesting study of situating water within the socio-ecological space in one of the most coveted and water-enriched regions of United States. Water politics form the center stage of this province, as tribal water culture, splendid natural attractions, water stakeholder interests, an on-going global climate change debate and existing demographics converge and overlap.

Central to this study is an examination of competing perceptions among various water users of the effects of water use practices on the present and future IMP river system. These perspectives are based on the competing values actors and institutions attach to water. Disagreements amongst these actors revolve around their emphasis on the market and non-market values of water. The government's vision is driven by the desire to fulfill the needs of its constituencies. These vary from supplying clean drinking water to households; to generating power to meet the needs of the region; to catering to irrigation agricultural and industrial development; to conserving the region's ecology, fisheries and wildlife as well as providing them with ideal habitats. The State drives this vision forward with scientific and technological expertise through diversions and withdrawals so that water can reach the communities to be served.

This vision of the State is contested by other actors like the tribes and non-profit organizations that use all means of advocacy, petitions and legal action to draw attention to additional issues that they feel are imperative for the sustainability of the rivers. A good example is the Sierra Club Spokane Falls settlement with Avista, that ensured that the summer season water flows in the Falls is

not diverted to the power plant, leaving flowing water in the falls during the peak summer months.

On their part, state agencies claim to take a participatory and community centered approach in the formulation and management of water policy decisions. The State, at all levels, participates with groups in watershed initiatives to save fish and cleanse the waters; however, some advocacy groups contend that consultation is merely *pro forma* to project the resulting decision as uncontroversial. In these contestations, the Northwest Power and Conservation Council could be considered a model if it can succeed in building credible collaborations that gain popular and political support.

Given the operational and secondary effects of dam operations that will continue to operate in the IMP landscape, there is no simple prescription for forming, implementing and managing the resources of the area under study. Yet interviewed stakeholders contended that there is an underlying need for reform in the way water is perceived, allocated and negotiated. Some observations are in order:

1. On a physico-geographical scale, all the sub-basins in the Intermountain Province studied here are located in the "blocked area" of the Grand Coulee Dam and Chief Joseph Dam with respect to the migration of anadromous fish species. The loss of these anadromous fish is a critical aspect of the regional biodiversity and has a wide array of impacts within the province. Water levels in all the main stem reservoirs in the IMP, including Lake Pend Oreille, Coeur d' Alene Lake, Lake Roosevelt, and Lake Rufus Woods are controlled by the hydropower system. Decisions about water management affect

people throughout the Columbia River Basin and beyond. There are also issues of flows in river waters that have a direct bearing on fish, wildlife and self-purification capacity of rivers. The timing and extent of fill and drawdown has a profound effect on the ability of the reservoirs in the IMP to sustain fish and affect many wildlife species. The release of water flow is mainly governed by the hydropower systems in the Pacific Northwest. The IMP, therefore, can be subject to varying degrees of risk to fish and wildlife due to miscalculated water management decisions in the river basins. Further, there have been funding challenges for restoration programs in the region.

Based on Washington state standards, the rivers in the province suffer from poor riparian conditions in certain stretches at certain times of the year. Hydrosystems have brought critical challenges in water quality indicators of the rivers such as dissolved oxygen, water temperature, phosphorous, fecal coliform bacteria, toxic chemicals and heavy metals at certain points of the rivers at certain times of the year. Local and state agencies acknowledge these concerns, and efforts are being made to study them and find solutions. Certain community indicator studies demonstrate that the collaborative efforts of the state and the dischargers have promoted changes for healthy quality of the rivers. State agencies and local governments contend powerful interests weigh in heavily for non-point sources of pollution and that runoff from agricultural fields needs serious attention and stringent action. Yet, they acknowledge that efforts are being made under various task forces to study and quantify these nonpoint sources of pollution

A consensus has emerged amongst state and non-state actors that climate change is becoming a reality. A recently released report of the Bureau of Reclamation (2011) clearly

references literature that the rise of the annual average temperatures in the Pacific Northwest will translate into impacts on hydrology, regional snowpack and runoff seasonality. These impacts likely include less frequent but more intense precipitation (Eisner et al., 2010; Slather et al., 2009; Sun Ethel, 2007). The DOE recognizes the impact that this change can cause to the region's water systems. Some of the snow pack that currently serves as storage for summer could create intensified competition amongst water users.

Evaluation of the greater Columbia River Basin (Payne et al., 2004; Lee et al., 2009) reservoir operations under the changed hydrological conditions and their findings included an increased competition between demands of instream flow and hydropower production. To maintain current levels of instream flows, a 10-20% reduction in firm hydropower would be required.

Climate change impacts will also affect the biodiversity that would affect water quality, evapotranspiration and erosion. Although there is uncertainty of forecasted precipitation patterns, advocacy groups contend that this uncertainty needs to be translated into the precautionary principle. As a member of the CELP group remarked, "climate change is here and Mother Nature may or may not mitigate us. Due consideration should be given to climate change research before additional water withdrawals from the river are sanctioned."

2. From a governance perspective, the study demonstrated the political nature of policy decisions and a strong need for a watershed approach based on hydrological rather than inter-jurisdictional political boundaries. Stakeholders acknowledged that water policies and management decisions are extremely political. With several state and

federal agencies, tribal sovereigns and their overlapping jurisdictions, the hydrology of conjunctive and ground management of water resources tends to be ignored. The province is fragmented among different regulatory regimes with different constraints that create a political divide in a basin-wide approach to water resource management.

Most players agreed that integrated watershed governance should be an essential part of the decision making process as these decisions create a much wider, more holistic consideration of affected interests. Integrating land, ground and surface water decisions as a geographic unit can lead to conditions where water policies can be reformed and operated differently to respond to the changing landscape of the Pacific Northwest. Although the DOE has started to engage in watershed governance in Spokane County, stakeholders feel that there needs to be a concerted effort to collaborate with other basin states with different water standards, the Canadian province and several tribal sovereigns in spite of the challenges and pressures.

3. On a policy level, competing perceptions about water resource development and

management decisions are evident amongst the State, tribes and non-profit groups. To State agencies like the DOE, “managing water is one of the critical challenges of the twentieth century” in order to meet the needs of expanding human activities. Some public interest groups believe that the State projects itself as a competent regime that is dynamic, modern and rational and tries to shape policy decisions by the scientific and technical knowledge. While stakeholder participation is strongly encouraged by the State, interviews of some non-profit groups revealed that terms like “community-centered,” “participatory,” and “bottom up” have served to qualify but not alter foundational assumptions of the State.

On the other hand, there are examples how a vibrant civil society in the IMP opens up policy spaces that challenge pervasive orthodoxies, reframes the debate and reconfigures relationships between actors and state agencies. There continues to be a strong need for a neutral social space where all stakeholders can equally participate and make their voices heard in the corridors of political power.

## 7. Caveats & Conclusion

The subject area of this monograph is situated in the Intermountain Province of the Columbia River Basin that lies within the states of Washington and Idaho with some portions extending into Montana and Canada. To keep the size of the monograph manageable, this study has limited its focus to a snapshot of the issues and challenges rather than conducting an in-depth analysis of each of the issues at stake. The study is Washington-centric but acknowledges the issues and challenges faced by Idaho jurisdictions over the Spokane River as well as transnational aspects of the Upper Columbia region. Hence, the study does not claim to be an exhaustive work of the region but an initial, broad overview of the processes and actors at work in their relationship to surface water.

The study is based on qualitative interviews and interactions with stakeholder representatives, functionaries of the government and a cross section of public interest groups, and tribes. The mode of the monograph was not to pursue the researcher's explorations of the issues, but to present the experiences and perspectives of the interviewees. This methodology was executed by speaking with a small but representative number of organizations, and conducting in-depth interviews with them. The statements made in this report, therefore, including the conclusions and implications or any recommendations, are

based upon the attitudes and opinions of the respondents and may not be generalizable. Due to the scope of the study, in this process some actors remain underrepresented, especially the private sector and federal government. During the interview process, some respondents preferred to speak on anonymity or reserved their comments. Others were unavailable and so some interviews did not materialize.

The road to sustainable water management in the IMP is a long and arduous one, and there are no easy solutions to structures that are permanent and here to stay. But policy approaches to water management such as water conservation, conjunctive use of surface and ground water, a shift from a supply-based paradigm and abundance of water have the potential to promote the region's economic growth without requiring additional river water diversions. These approaches can also be sufficient to meet human needs and a healthy ecosystem that sustains salmon population, the realities of the electric power industry, and the constraints of water law. Sound comprehensive water resource management needs good public policies that depend not just on scientific and technical expertise but also on the willingness of elected public officials to take actions in the face of risks, uncertainties and growing pressures that face our communities.

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## Endnotes

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1 Sustainability today remains a contested term meaning different things to different people. However, my interviews revealed that while stakeholders differed on the ways and methods to achieve sustainable water resource management there appeared to be a form of consensus on the definition to sustainable water resource management that emphasized on the need for balanced and prudent use of the resources to leave enough for the future generations by managing issues of availability, access and quality in a way necessary to maintain human health and sustain ecosystems.

2 An anadromous fish is born in fresh water. It spends most of its life in the sea and returns to fresh water to spawn. Salmon, smelt, shad, striped bass, and sturgeon are common examples of anadromous fish.

3 The precautionary principle in international environmental law emphasizes that where threats of damage lack full scientific certainty shall not be used as a reason for postponing cost effective measures to protect the environmental degradation.

4 Conjunctive use of surface and groundwater consists of harmoniously combining the use of both sources of water in order to minimize the undesirable physical, environmental and economic effects of each solution and to optimize the water demand/supply balance. Usually conjunctive use of surface and groundwater is considered within a river basin management program, i.e. both the river and the aquifer belong to the same basin.

5 The supply-based paradigm in water is based on the assumption that as long as there is water in the river physical solutions and engineering developments. Traditional supply-planning activities have tended to focus on providing new sources of supply to meet future water demands. Dam building has been an important component of traditional water supply planning, and civil engineers have played a major role in the construction and maintenance of the world's dams.

6 This is not to discount the impact it can have on the state of Washington in the case of renegotiation process that will have many more players and interests at stake, and climate change.

7 This interview was carried out with the prior administration and may not reflect the views of the current one.

8 The executive order tribes emerged through signed executive order documents, which formed the basis for a tribe's formal federal recognition. A federally recognized tribe is an American Indian or Alaska Native tribal entity that is recognized as having a government-to-government relationship with the United States, with the responsibilities, powers, limitations, and obligations attached to that designation, and is eligible for funding and services from the Bureau of Indian Affairs (BIA, 2011).

9 The state is not a monolithic agency but comprises of several departments with different and overlapping jurisdictions. There are federal and state agencies that are engaged in water resource management and development. For the purpose of this study, a reference is made to the important state agencies but the focus of the interviews and dialogue was the Department of Ecology and the Bureau of Reclamation.

10 Doctrine of Prior Appropriation is the water rights doctrine adopted by most western states, giving the first person to use water from a stream the first right to such water. If the first user does not consume all of the water, then the second and later users can appropriate water for their needs. The water right is not necessarily tied to land ownership and can be sold or mortgaged like other property.

11 This doctrine establishes that when the federal government created Indian reservations, water rights were reserved in sufficient quantity to meet the purposes for which the reservation was established.



# EASTERN WASHINGTON UNIVERSITY

start something **big**



## **Our Mission**

Eastern Washington University's mission is to prepare broadly educated, technologically proficient and highly productive citizens to obtain meaningful careers, to enjoy enriched lives and to make contributions to a culturally diverse society. The University's foundation is based on career preparation, underpinned by a strong liberal arts education.

## **Tradition, Connections, Opportunity**

In 1882 the Benjamin P. Cheney Academy opened its doors to more than 200 students. More than a century later, the Academy has evolved into Eastern Washington University. The regional, comprehensive public University is a driving force for the culture, economy and vitality of the Inland Northwest region, with programs also offered in Spokane, Bellevue, Everett, Kent, Seattle, Shoreline, Tacoma, Vancouver and Yakima.

Eastern offers students the opportunity to study one-of-a-kind, in-demand disciplines such as biotechnology, cybersecurity, forensic science, children's studies, dental hygiene and urban planning. In addition, Eastern is the only regional university in the state to offer a doctorate in physical therapy.

Eastern enhances its strong commitment to teaching and learning by vigorously pursuing grants, extramural funding and student-faculty research collaborations. For the most recent fiscal year, the University secured a total of \$17 million in grants and extramural funding.

A focus on personal attention, faculty excellence and community collaboration allows Eastern to accomplish its mission of preparing well-rounded students ready to hit the ground running in their chosen career fields. Eastern will give you the chance to start something big!

## **Accreditations**

The University is accredited by the Northwest Association of Schools and Colleges and many discipline-specific associations, such as the American Assembly of Collegiate Schools of Business, the National Association of Schools of Music, the Computing Sciences Accreditation Board, the National Council of Accreditation of Teacher Education, the Planning Accreditation Board and many more.