

AN ABSTRACT OF THE THESIS OF

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Chiloquin Dam at Sprague River Mile 0.87, Oregon

Abstract approved:

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Several reports related to dams and dam removal have been released this decade by non-governmental organizations including *Dam Removal: Science and Decision Making* by The Heinz Center which focused on small dams, since most of the dams removed to date as well as those likely to be removed in the near future fall into this category. The report found that there is a need for case study social research on small dam removal. Accordingly, this thesis seeks to identify the social and policy factors that influenced the decision to remove Chiloquin Dam on the Sprague River, Oregon. This irrigation diversion dam was constructed from 1914-1918 for the Klamath Tribes under the federal Indian Irrigation Service program and subsequently transferred to the Modoc Point Irrigation District in 1973, after termination of the Tribes by the federal Government. Chiloquin Dam was identified in a 1988 Endangered Species Act listing as a primary factor in Lost River and shortnose sucker species decline, a species of cultural significance for the Klamath Tribes. Although early reports, including those by Klamath Project irrigators, called for improved fish passage at Chiloquin Dam, it was not until jeopardy biological opinions triggered a shut off of water to the federal irrigation project in 2001, that Chiloquin Dam became a priority. Directed by legislation, the United States Bureau of Reclamation convened stakeholders in *the Chiloquin Dam Fish Passage Study* for nine months in 2002-2003 to determine a preferred alternative for fish passage, of which dam removal was recommended.

To identify the social and policy factors that influenced the Chiloquin Dam removal decision, 21 informants were interviewed including participants in the Fish Passage Study as well as those involved in the 1988 Endangered Species Act (ESA) listing. Among the findings, respondents perceived that the ESA was the driving policy force, along with tribal restoration (the tribal trust responsibility) in the dam removal decision. Modoc Point Irrigation District members (Off-project) and tribal respondents believe that the dam removal was motivated by political support for Klamath Project irrigators. Despite these beliefs and divergent expectations for Chiloquin Dam fish passage, with the political imperative and resources, an agreement was reached in which each party had their needs addressed.

An analysis using the social construction model found that the events of 2001 threatened to push irrigation interests from a powerful advantaged political position. The Fish Passage Study presented capacity and inducement instruments that responded to irrigation and tribal concerns and may also serve to restore the irrigation position as an advantaged social construction. Overall, uncertain science, differing beliefs of what dam removal would mean, and a lack of political priority served to delay action on fish passage at Chiloquin Dam from the ESA listing in 1988.

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An Exploratory Study of the Social Factors of Small Dam Removal:
Chiloquin Dam at Sprague River Mile 0.87, Oregon

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I understand that my thesis will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my thesis to any reader upon request.

Jason M Hatch, Author

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An Exploratory Study of the Social Factors of Small Dam Removal: Chiloquin Dam at Sprague River Mile 0.87, Oregon

INTRODUCTION

Dams have provided numerable benefits to human development. Many dams in the United States constructed for economic development purposes remain in stream beyond their intended lifespan (O'Malley-Wade 2002). This aging infrastructure has led to the number of dams classified as unsafe to increase 33% from 1998-2005 (American Society of Civil Engineers 2005). As dam owners, both private and public, consider the cost of maintenance and required compliance with contemporary environmental standards to protect species and environmental quality, dam removal may increasingly be considered as an alternative to repair or modification. In order to prepare for this prospect, develop appropriate dam removal policies, and address the fundamental knowledge gap of the social factors of dam removal, case studies may prove useful (Graf 2002). Case studies that solicit the perceptions of dam removal decision makers and community members regarding the social factors may narrow that knowledge gap.

More than 79,000 dams are listed in the US Army Corp of Engineers National Inventory of Dams (NID). These are dams that are larger than 25 feet in height and provide more than 15 acre feet of storage, higher than 6 feet with 50 acre feet of storage and/or designated as hazardous (US Army Corps of Engineers 2008). There are estimates ranging from thousands to several million more small dams in the United States not included in this database (Trout Unlimited 2008). The NID categorizes 56% of dams as privately owned, 20% owned by local governments, and approximately 5% owned by each the state and federal governments. The federal dams are operated by departments and agencies including the Defense Department (910 dams; 631 are Army Corps of Engineers dams); Department of Energy (15 dams); Tennessee Valley Authority (49 dams); and the Department of Interior's Bureau of Indian Affairs (425 dams on reservations) (Federal Emergency Management Agency 2006). The primary purposes for dams listed in the National Inventory of Dams include 40% for

recreation, 17.7% for flood control, 17.1% for fire and farm ponds, 11% for irrigation, and 2.9% for hydroelectric power generation (Federal Emergency Management Agency 2006). Dams may also provide services such as drinking water storage and navigation. In the western United States, dam services have made profound contributions to settlement and development.

While dams have provided economic and social benefits, they have had environmental and social consequences. Dams have altered water quality, disrupted the natural flow regime, disconnected the river from its floodplain, blocked sediment/wood from moving downstream, allowed floodplain development, incised channels and blocked aquatic species passage (Born, et al. 1998). The increasing awareness of dams' unintended consequences, aging dam infrastructure, and the need to better understand the science and human dimension of dams and dam removal, has led to several reports this decade including the United Nations World Commission on Dams (2002), The Aspen Institute's *Dam Removal: A New Option for a New Century* (2002), a special issue of the journal *BioScience* (2002), and the Heinz Center's *Dam Removal: Science and Decision Making* (2002).

One measure of the immaturity of dam studies is the lack of a universal scale to quantify size (see Table 1). The Heinz Center characterizes dams by the amount of water impounded; 1 to 100 acre/feet being small, 100 to 10,000 acre/feet as medium, and in excess of 10,000 acre/feet as large (Graf 2002). The US Army Corps of Engineers NID utilizes a combination of height, length and storage capacity, with large dams being at least 25 feet in height or 50 acre/feet in storage (Federal Emergency Management Agency 2006). States may employ different criteria for designating dams (Poff and Hart 2002), such as the Oregon Water Resources Department Dam Safety Office, which describes dams exceeding 10 feet high and 9.2 acre/feet storage as being large dams, of which there are 1300 in Oregon. The dams below these dimensions are considered small "non-statutory dams," which number 10,000 in the state of Oregon (Oregon Dam Safety Program 2007; Association of State Dam Safety Officials 2007). Dams are also differentiated by their function, scale, geographic location, which agencies

regulate them, social benefit, and environmental costs. A more universal measure and characterization of dams may not only provide a better accounting of dams but also aid in projecting the impacts of dam removal. For the purposes of this proposal, the irrigation diversion Chiloquin Dam on the Sprague River with dimensions of 21 feet high, 220 feet in length and a reservoir storage capacity of 60 acre/feet will be characterized as a small dam (see Table 1).

Table 1: Various Standards for Measuring Dam Size

MEASURE	State of Oregon			Chiloquin Dam
	NID	Heinz Center		
Storage-Large	9.2 a/f	50 a/f	10,000 a/f +	100 a/f
Storage-Medium			100-10,000 a/f	
Storage-Small			1-100 a/f	
Height-Large	10 ft +	25 ft +		22 ft
Height-Small				

History

Water has been viewed as a tool to address dire economic conditions and provide for social transformation. In the 1930's the Roosevelt Administration, seeking to facilitate the nation's climb out of economic depression through the Works Progress Administration (WPA), undertook an ambitious program of dam construction. This program built enormous structures, provided thousands of jobs, facilitated further western development, generated cheap electricity, helped World War II construction and among other measurements, resulted in 36 dams on the Columbia River system in 36 years (Reiser 1993). This surge in dam building was identified as the "new Reclamation area" (Reiser 1993) and the 1950's through 1960's in the United States as the "Age of Dams." The first reclamation era was spurred by the 1902 Reclamation Act, advanced as a remedy for the drought and depression of the 1890's, that ultimately built enormous irrigation works in western states, including the Klamath Project and Umatilla Project in Oregon (Pisani 2002). The General Allotment Act of 1887 (Dawes Act) called for the

subdivision of Indian reservation lands into individual allotments distributed to Native American men with a professed goal to transform Native Americans into farmers. Together these initiated some of the first western reclamation projects through the new Indian Irrigation Service, including the construction of Chiloquin Dam from 1914-1918 in Oregon.

This “Age of Dams” came to a close in the late 1960’s as the utilitarian values that drove dam construction faced a new era of emerging environmental values, evidenced by the passage of the Clean Water Act in 1972 and the Endangered Species Act of 1973 (Bowman 2002). Johnson and Graber (2002:732) suggest, “Societal values (and associated economic values) regarding dams and rivers have changed over time.” Dams facing a new regulatory context reflective of these contemporary values are altering operations (Bach 2007) and some are being considered for removal as a river restoration strategy; in the last 30 years, more than 200 dams have been removed in the United States (Doyle et al. 2003). Although dam removal has not been frequent, it may be considered more often with an aging infrastructure, costs of repair or modification, and changing environmental values.

While large hydroelectric dams considered for removal receive the most attention, such as the Army Corps of Engineers Snake River dams, the vast majority of dams actually being removed are much smaller, less than five meters in height (Hart et al. 2002; Grant 2001). While there is abundant information on dam construction, there is comparatively little on dam removal. In order to address this knowledge gap, researchers have called for more attention to small dam removals that may serve as experimental models (Pohl 2002; Baish, David, and Graf 2002; Doyle et al. 2005). While this recommendation primarily refers to the scientific, geomorphic, and ecological uncertainties of dam removal, this same counsel may be extended to an analysis of the human dimensions of dam removal including the influence of social, cultural, political and legal factors.

Community isolation from dam removal decision-making, a lack of biological, economic and social data, as well as a lack of research on the human dimensions of dam removal are considered significant shortcomings in the

research (Graf 2002; Sarakinos and Johnson 2002). The National Academies of Science urge “ex post evaluations” of projects and policies to evaluate the strengths and weaknesses, research which addresses uncertainties regarding Native American water rights, and analyzing stakeholder input processes (Bitterli 2001).

The goal of this study is to address the gap in understanding of the human dimension of dam removal, using a case study methodology to identify the perceptions of:

- social and policy factors which influence small dam removal; and
- factors that influence the duration of time between a dam being considered environmentally problematic to dam removal.

CONTEXT

The decision to remove Chiloquin Dam on the Sprague River in Klamath County, Oregon was chosen as the case study because:

- Sprague River conservation measures will have the greatest impact on the Upper Klamath Basin watershed (NRCS 2006);
- policies which drove dam construction also resulted in endangering a species of significant cultural importance to the Klamath Tribes;
- Chiloquin Dam resides in a basin undergoing water rights adjudication, thus subject to the fears and politics of changing water resource management strategies; and
- Chiloquin Dam is near the small rural town of Chiloquin, and has served as source of recreation, aesthetics and identity.

Each dam removal takes place in a particular geographic context under a unique set of ecological and social circumstances (Graf 2002; O'Malley-Wade 2002). The same conditions that make Chiloquin Dam a unique case study may also prove to make it a non-replicable process. Yet, these particular contexts (a basin in adjudication, endangered species of tribal cultural value, a rural town with a diverse population, a former Indian Irrigation Project) may prove insightful

for other community natural resource decision-making and dam removals while expanding the understanding of the human dimensions of dam removal.

Chiloquin Dam History

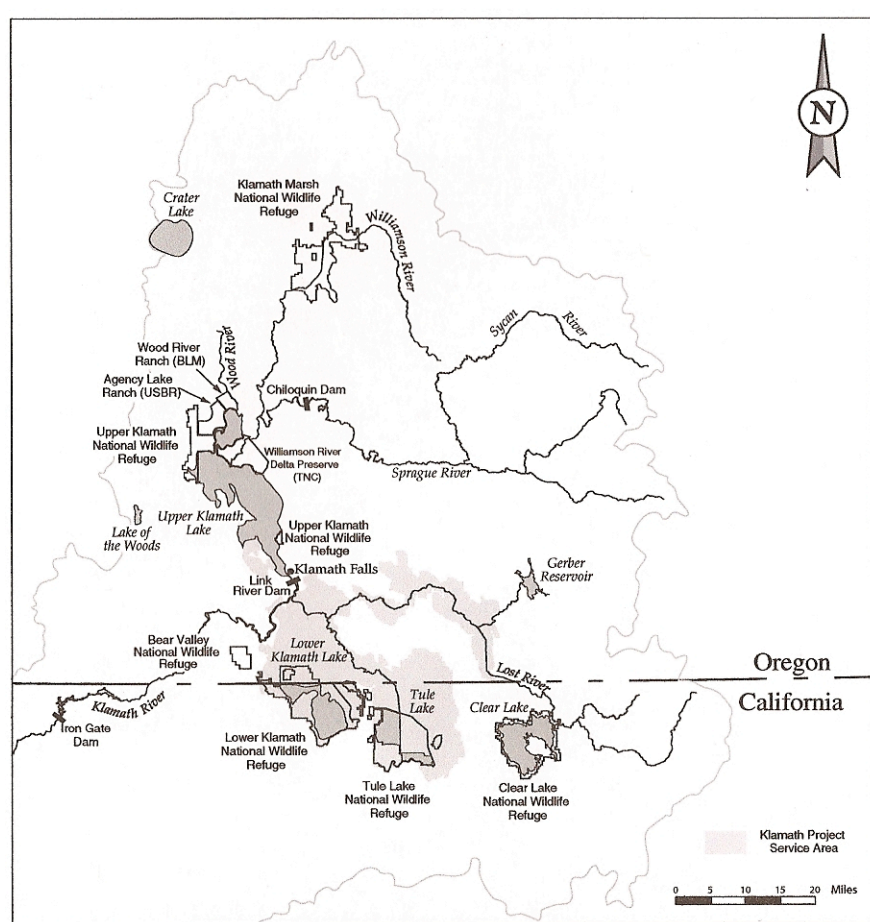
Chiloquin Dam was built for irrigation diversion across the Sprague River in the Upper Klamath Basin of Klamath County Oregon for the Klamath Tribes from 1914-1918 as the Klamath Indian Irrigation Project (Bureau of Indian Affairs 2005). The Klamath Tribes are actually three tribes-the Klamaths, Modocs and Yahooskin-who were compelled to live together on the Klamath Reservation upon ceding millions of acres of land under the 1864 Treaty of Klamath Lake. Construction costs for Indian irrigation projects were provided by the sale of “surplus” allotment land to non-natives, so tribes bore the cost of these projects while the beneficiaries were often non-tribal members (Pisani 2002). Pisani (2002) notes that irrigation and other acts of land improvement only increased land values and the prospect that it would leave Native hands. During the 50 years in which the Dawes Act was in effect, Native American land holdings decreased almost two thirds, from 138 million acres to 48 million acres (Newton 2005).

After allotment, the Klamath Tribes faced another United States Native American policy, termination, which sought to end federal supervision of Indian affairs, the government-to-government relationship, and communal reservation land holdings. Tribal members would simply become citizens of the United States. In 1954, Congress voted to terminate 70 bands and tribes, including the Klamath Tribes, with all land being purchased by the United States Government and the Klamath Indian Irrigation Project at Modoc Point including Chiloquin Dam being transferred to the private Modoc Point Irrigation District (MPID) in 1973. Termination ended social service programs available to the tribes and administered by the federal government, made tribal members subject to state taxation and terminated tribal trust status (Strickland and Wilkinson 1982).

Irrigators

The Klamath Project was initiated by the 1902 Reclamation Act with acquisition of an existing private irrigation canal systems and new construction beginning in 1906 (United States Bureau of Reclamation 2008). Among the settlers on the reclamation project, the federal government gave priority to World War I and II veterans. Klamath Project irrigators, represented by the Klamath Water Users Association (KWUA), today have almost 230,000 irrigated acres utilized for production of hay, grains, potato, peppermint and livestock. KWUA was organized to protect the interests of project irrigators since 1953 (Klamath Water Users Association 2008) (see Figure 1).

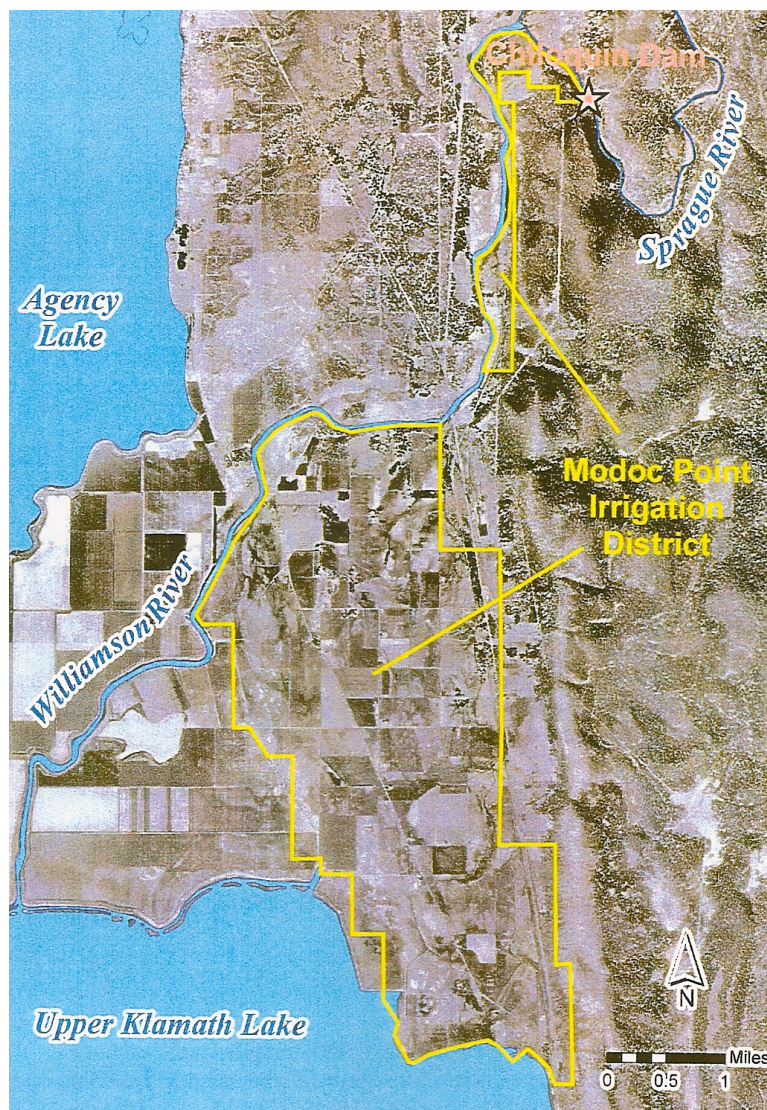
Figure 1: Map of Klamath Basin Watershed, Oregon



Source: Endangered and Threatened Fishes in the Klamath River Basin: Causes of Declines and Strategies for Recovery, National Research Council, 2004.

The Modoc Point Irrigation District (MPID) was formed after the termination of the Klamath Tribes, as a private governance structure of landholders within the Indian Irrigation service's Modoc Point unit, an allottee project. MPID received the Chiloquin Dam and associated irrigation works in the 1973 transfer from the federal government and currently has 61 members, six of whom are Indian allottees who use 5,200 acres of irrigable land primarily for pasture, grain, potatoes, and (Hatch 2008) (see Figure 2).

Figure 2: Modoc Point Irrigation District Lands



Source: Chiloquin Dam Fish Passage Study: Project 1898, Klamath River Basin, Oregon. United States Department of Interior, 2003.

Tribal Trust

Native American tribes are sovereign nations, which by virtue of treaties, legal decisions and federal statutes have developed a trust status with the United States. This status establishes a federal government tribal trust responsibility to manage natural resources in accordance with the aforementioned agreements, decisions and laws (United States Fish and Wildlife Service 2008). Regarding the Klamath Tribes, the tribal trust responsibility includes protection of water quantity and quality to support traditional hunting, fishing and gathering, of which, establish successful fish passage at Chiloquin Dam is a strategy to insure tribal trust (Bureau of Indian Affairs 2005).

The Klamath Basin Adjudication

Adjudication is the legal process to determine the quantity and priority date of a water right claimed to have been established prior to the state water code. The Klamath Basin Adjudication, to quantify pre-1909 claims, began in 1975 and as of March 2008 had more than 90% of the claims settled (Oregon Water Resources Department 2008). Among the rights to be determined are Klamath tribal water rights and other water users who are above Upper Klamath Lake.

Endangered Species Listing

Klamath County has experienced social and environmental turbulence as a result of over-appropriated water rights, uncertainty with water rights adjudication, drought conditions, the 1988 listing under the Endangered Species Act (ESA) by the United States Fish and Wildlife Service (USFWS) of the Lost River and shortnose sucker (henceforth collectively referred to as sucker), and the biological opinions guiding their recovery and impacting Klamath Project operations. Jeopardy biological opinions by USFWS for endangered sucker identified as the best alternative specific Upper Klamath Lake levels to insure survival of the species. Another jeopardy opinion for the threatened Coho Salmon by the National Marine Fisheries Service, “proscribed higher” downstream

Klamath River flows (Lewis 2004). These management alternatives in 2001 led to the shut-off of irrigation water to the United States Bureau of Reclamation's Klamath Project, which lies between Upper Klamath Lake and the Klamath River (see Figure 1).

Under the 1988 ESA listing, damming of rivers was identified as a significant factor in the decline of the species, with Chiloquin Dam cited as a probable prime factor (United States Fish and Wildlife Service 1988). The difficulty of sucker passage upstream was recognized by the US Indian Service Klamath Tribes irrigation engineer, in a letter to a colleague during dam construction:

From my observations here, I find this type of fishway [concrete] suitable for a small stream... Trout or other swift swimming fish can travel up this fishway with ease, but the slow swimming fish, such as carp and suckers, have difficulty in getting over the structure (Hincks 1916). (see Figure 3 and Figure 4)

Figure 3: Photo of Chiloquin Dam Fish Ladder Circa 1916



Reproduced at the National Archives and Records Administration-Pacific Alaska Region (Seattle)

Figure 4: Natural Rapids Fish Ladder at Chiloquin Dam-circa 1916



Reproduced at the National Archives and Records Administration-Pacific Alaska Region (Seattle)

Subsequent installation and modification of fish passage facilities were unsuccessful in achieving sucker passage.

More recently, the Natural Resources Conservation Service (NRCS) conducted a two-year assessment, which determined that conservation measures targeted in the Sprague River Watershed would have the greatest environmental impact on water quality and habitat in the Upper Klamath Basin, “Specifically, the greatest potential for improving water quality, restoring aquatic habitat and reducing irrigation water demand” (NRCS 2006).

The Chiloquin Dam Fish Passage Study

Initiated by passage of the *Chiloquin Dam Fish Passage Feasibility Act* in 2002 (HR 2585), the Chiloquin Dam Fish Passage Study group, coordinated by the United States Bureau of Reclamation (USBR), was a nine month collaborative stakeholder process during 2002-2003. Fish Passage Study participants included

representatives of the Klamath Tribes, MPID, Klamath Project irrigators, governmental agencies, local governments, and involved citizens. This group recommended removing Chiloquin Dam (see Figure 5) and replacing it with screened intake pipes, pumping stations and diversion canals for the Modoc Point Irrigation District (MPID). Further, the group was given assurances that funding would be directed to improvement of upstream habitat and mitigation fund would be established for MPID to pay for the ongoing operation, electricity and maintenance of the new pumping stations. The arrival at consensus by this diverse group stands in contrast to the widespread reports of conflict among parties exacerbated by the agricultural water shut-off in 2001, the fish die-off in 2002, and the subsequent decline of the west coast salmon fisheries (Martin 2003; Bailey 2007).

Figure 5: Photo of Chiloquin Dam-2006



*Source: Klamath Falls Herald and News,
Andrew Mariman, August 2006.*

Physical Conditions of Chiloquin Dam Removal

The Chiloquin Dam Fish Passage Study compiled the latest scientific information related to the condition of the listed species and the physical habitat. The primary species of concern, the shortnose and Lost River sucker were historically abundant in Upper Klamath Lake and are considered unique lake dwelling and river spawning fish (Bureau of Indian Affairs 2005). Human changes to the landscape and hydrology from draining of wetlands, diversions for agriculture, damming of rivers and the deleterious impact on water quality conditions has led to the worst habitat conditions of any river in the Klamath Basin which has contributed to sucker decline (United States Department of Interior 2003).

The Sprague River is a significant tributary of Upper Klamath Lake and the Klamath River, with a watershed area approaching 1 million acres, 56% of which are public lands (NRCS 2006). Sprague River water quality is considered impaired under the federal Clean Water Act by the State of Oregon for exceeding levels of phosphorus, phosphate, habitat modification, dissolved oxygen, pH, sedimentation, temperature (19 stream segments impaired) and e coli (ORDEQ 2007; NRCS 2006). Chiloquin Dam is located at Sprague River mile 0.87 in the Upper Klamath Basin. Agricultural operations, efforts to straighten and stabilize Sprague River stream channels have contributed to increased sedimentation, lower summer flows and reduction of stream bank cover leading to increased temperatures which have been found to distress sucker (United States Department of Interior 2003).

Soil sediment that has accumulated behind the dam is estimated to be 45,000 cubic yards, found to be non-toxic and represents less than 1/3 of the annual sediment load transport of the Sprague River, suggesting that sediment would move down river within weeks to months (United States Department of Interior 2003). The primary dam removal impacts on the sucker will include unimpeded access upstream, potential short term impacts on sediment deposition in downstream spawning grounds, and “lower spawning densities” as species spread out in the expanded upstream habitat (Bureau of Indian Affairs 2005).

While Chiloquin Dam was identified as a probable primary factor in the decline of sucker as early as 1988, it is 20 years later that the dam is scheduled for removal in the summer of 2008. An analysis of the Chiloquin Dam removal decision process may provide key dam removal lessons regarding 1) public participation in decision-making; 2) the policies which influence dam removal; 3) social concerns especially with regard to place identity; and 4) legal concerns of water rights adjudication.

LITERATURE REVIEW

To further understand the context in which this dam removal process has taken place a literature review related to dam removal policy, collaborative natural resources decision-making, Native American natural resource management and other human dimensions of dam removal was undertaken and reviewed below. In addition, Schneider and Ingram's Social Construction Theory (1993) will be reviewed.

Policy

Safety and economic concerns have been the dominant rationale for dam removal; but beginning in the 1990's environmental concerns became a leading motivation (Pohl 2002; Graf 2002). Safety reasons include the danger of dam failure or potential liability from a death or injury at the structure, while economic grounds include dam owner relief from the costs of operations and maintenance (Graf 2002; Doyle et al. 2000). It is a combination of these three factors most often taken into account in a dam removal decision (Baish, David, and Graf 2002). Among the important federal laws which may play a role in dam removal are the Endangered Species Act (ESA), the Clean Water Act (CWA), the Wild and Scenic Rivers Act (WSRA), the Indian Dam Safety Act, the National Environmental Protection Act (NEPA), the National Historic Preservation Act, and western water law (Graf 2002). NEPA provides for federal agencies to report on the environmental consequences of a proposed federal action, especially if on

federal land or federally permitted or funded (Graf 2002). The CWA, which provides a broad mandate to restore and protect the nation's waters, may influence permitting on any removal resulting in the release of stored sediment behind the dam. The Indian Dam Safety Act is intended to identify which dams on Indian land, if they failed, would pose a danger to lives.

The ESA, although it has never directly required dam removal, through the listing of species and designation of critical habitat (Pejchar and Warner 2001) may provide motivation to initiate debate on dam removal (Graf 2002) and serve as “the trump card, the issue that transcends all others and drives final decisions” (Graf 2003:13). Tribal treaties, legal decisions, water rights, and the involvement of tribal resources provide for tribal participation in dam removal decisions (Graf 2002). Combined with these legal factors, politics is influential at every step of the decision-making process, defining what is to be considered, supporting consideration of dam removal, or serving as a significant impediment (O'Malley-Wade 2002; Pejchar and Warner 2001).

There is a need to develop dam removal criteria policy (e.g. safety, economics, utility of existing structure, environmental considerations) since there is little consistent policy to direct agency action, nor specific federal policies on dam removal (O'Malley-Wade 2002; Bowman 2002). Whitelaw and MacMullan (2002) urge consideration of a cost-benefit analysis protocol to evaluate each dam, as well as what Doyle, Harbor, & Stanley (2003) identify as a clearly defined purpose of why a dam is being removed. On whole, dam removal policy must be guided by a better understanding of the scientific, economic and social impacts of dams and dam removal (Doyle et al., 2003).

Accompanying the lack of consistent dam removal policy is an uncertainty regarding the impacts of removal among decision-makers and community members. Uncertainty may be complicated by ongoing water rights adjudication, a state administrative procedure to determine water rights based on the western United States water law of prior appropriation. Prior appropriation does not require adjacency to water to obtain a water right, but is guided by its primary tenet “first in time, first in right,” giving priority to those first to make a claim.

The goal of prior appropriation was securing a property right of water and economic development, not equal access (Pisani 1996). Adjudication is the process to determine the water rights of users within a basin or watershed who claim a right prior to the establishment of the state water code including federal reserved water rights such as those attached to Indian reservations. Cronin and Ostergren (2007:535) write of the experience of the Yavapai Apache Nation (YAN) where:

Unresolved [water] rights have created a political tangle for the YAN, particularly in their goal to expand the reservation and designate more land to federal trust status. Many in the watershed see the YAN entitlement as a looming threat and are apprehensive about the YAN's future development plans, especially with regard to increasing the amount of tribally irrigated agriculture.

The lack of dam removal policy, multi-agency jurisdictions, and an unclear regulatory path may lead to long timelines from dam removal decision to actual removal. The Elwha Dams in Washington State for example, were approved for removal in 1992 and removal is slated to begin in 2012. The Aspen Institute suggests a streamlined regulatory process for dam removal, which safeguards the environment since such lengthy delay may actually serve as a barrier to considering dam removal (O'Malley-Wade 2002). Bowman (2002) indicates that laws geared to protect the environment are incompatible with restoration activities such as dam removal, and that consideration by regulatory agencies provide some "accommodation" to projects geared towards restoration. In general, the legal and policy infrastructure is not fully developed to address dam removal as a restoration effort.

Science

Doyle et. al (2003:456) note "that while dam removal is becoming more common," the sciences that may help predict removal impacts are far from developed. Grant (2001) and Doyle, et al. (2003) write of the need to document

case studies in order to better understand the impacts of dam removals and anticipate the consequences of future dam removals (Stanley and Doyle 2003). Scientific information is crucial for future dam removal plans, for citizens engaged in the dam removal decision-making, for policy-makers designing law related to this emerging practice, and for communities adjusting to removed infrastructure (Johnson and Graber 2002; Sarakinos and Johnson 2002). Dam removal science is very undeveloped, marked by the uncertainty of removal impacts (Pizzuto 2002; Poff and Hart 2002; Baish, David, and Graf 2002).

In the disruption of the natural flow regimes of rivers, dams serve to trap sediment and debris that would typically be transported and deposited by a free flowing river. It has been estimated that of the dams in the National Inventory of Dams, 92% of the reservoirs behind them will be half full of sediment within the next 90 years (Graf 2002). The composition and transport of sediment after dam removal, and the impact on downstream communities and habitats is a major consideration (Stanley and Doyle 2003; Pizzuto 2002; Bednarek 2001). It is advised that research and modeling (Pizzuto 2002) be conducted on sediment to determine the chemical quality; whether it is contaminated; the volume, sediment size, distribution, and a comparison of whether the sediment volume exceeds the natural ability of the stream to transport it (Hart et al. 2002; O'Malley-Wade 2002).

While uncertainty of ecological science is a challenge in efforts to design natural resource policy, the expectations of complete and unimpeachable science may be unreasonable (Owen 2002; Dovers, Norton, and Handmer 1996) and taking action before complete consensus is achieved may be necessary (Ludwig, Hillborn, and Waters 1993). Uncertainty, in many ways exacerbated by human influences on the environment and the doubt that fuels inquiry, is a foundation of scientific exploration (Bradshaw and Borchers 2000). Many suggest improved communication between scientists, citizens and policy-makers to bridge the science-policy gap (Bradshaw and Borchers 2000; Dovers, Norton, and Handmer 1996; Poff et al. 2003). Bradshaw & Borchers (2000:7) call on the non-science community to change their perception on uncertainty, such that it “be regarded in

the policy arena as it is in scientific circles: as information for hypothesis building, experimentation, and decision-making.” Stakeholders are urged to understand that complex ecosystem issues may require a complex decision-making process (Owen 2002). Improved education and outreach, adaptive management, policy learning and contingency planning to improve policy decisions and the science that informs them is recommended (Dovers, Norton, and Handmer 1996) while O’Malley (2001) advises that clarifying uncertainties up front will allow for adjusted expectations.

Many scientists identify the need to conduct case studies and further modeling in order to better predict the impacts of dam removal on the ecosystem (Bednarek 2001; Pizzuto 2002; Poff and Hart 2002), the restoration of which is increasingly cited as a rationale for dam removal (Bender 1997; Pohl 2002). Dam removal alone will not result in an immediate recovery of the species or habitat (Graf 2002; Stanley and Doyle 2003). Scientific uncertainty, as well as the dearth of case studies on both the science and social science of dam removal, suggests a need to engage in modeling, experimentation, and adaptive management on small dam removals. Achieving greater measures of predictability regarding the science of dam removal is critical, as policy and participation are guided by scientific information.

Human Dimension of Dam Removal

The social context of dam removal has received little attention in the literature and this is viewed as a significant “shortcoming” (Graf 2002). As the physical science of dam removal advances, there is a need to understand the human dimensions of dam removal including the social (O’Malley-Wade 2002; Johnson and Graber 2002) and policy concerns. Communities considering dam removal have faced 1) isolation from decision-making processes, 2) anxiety about change, and 3) lack of information regarding the social, economic and scientific impacts regarding dam removal (O’Malley-Wade 2002; Johnson and Graber 2002; Sarakinos and Johnson 2002). Anxiety is heightened and contentiousness increased when decisions regarding dam removal are perceived as driven by those

“outside” the community (Born et al. 1998). Common concerns regarding dam removals include safety, economic, environment, aesthetics, property values, recreation changes, cultural, and loss of a historic structure (Graf 2002).

Decision-making

Collaborative decision-making is reviewed since this is the process utilized for Chiloquin Dam removal. Endter-Wada, et al. (1998) hold that traditional public participation shortcomings include unrepresentative social data, overrepresentation by self-identified stakeholders, and decisions based primarily on science may generate conflict and misunderstanding. Recommended components of a collaborative decision process include a diverse group of stakeholders, clearly defined goals, concerns identified in the process, information available for decision-making, a clearly defined decision-making protocol, and community outreach (Lord and Cheng 2006; Johnson and Graber 2002). Although a wide stakeholder group is suggested, not all values or concerns may be reconciled (O'Malley-Wade 2002). Since dam removal decision-making is a relatively new field of study, further inquiry into the collaborative natural resource decision-making is considered.

Collaborative natural resource management has been increasingly utilized by government agencies for citizen involvement, decision-making, regulatory flexibility, and as a way to contend with difficult natural resource issues (Singleton 2002). Some stakeholders in natural resource decision-making situations described as messy problems-where goals are ambiguous and there is a lack of scientific agreement-have suggested that a successful decision process results in social learning, which would include the legal processes as well as understanding the values, beliefs and perspectives of others in the process (McCool and Guthrie 2001). It is believed that collaboration may reduce conflict, build relationships, and produce a better outcome (Conley and Moote 2003) with stakeholders moving beyond their provincial interests to the greater community interests (Singleton 2002). Others argue that there is no departure from self-

interest; collaborative processes are a different venue but remain infused with politics (Walker and Hurley 2004).

Successful collaborative decision-making, it is contended, must develop trust among the stakeholders (Kenney 1999; Lubell 2004; Schusler, Decker, and Pfeffer 2003). Some have characterized the barriers to a successful collaborative process to include a lack of trust, inadequate goal definition, and inflexibility of timelines (Lachapelle, McCool, and Patterson 2003). While the desire to build community may be a social objective, it may not accomplish the ecosystem goals of the stakeholder process (Lubell 2004). Recent critiques of collaborative decision-making disagree with the correlation between trust and relationship-building, suggesting that attainment of these factors does not necessarily lead to more decision outcomes (Lubell 2004; Kenney 1999). Raymond (2006) proposes that trust is neither relevant nor important to successful collaborative efforts and that participants engage in civil negotiation all the while being at odds over the goals. He writes of the development of a Habitat Conservation Plan in Clark County, Nevada where cooperation without trust occurred through economic self-interested and institutional mechanisms:

Thus, the fact that the Clark County HCP provides substantial financial benefits helps keep the group working collectively, for fear of otherwise losing out. More than one stakeholder mentioned the importance of this financial incentive in staying committed to a time-consuming and stressful IMC process (Raymond 2006).

While collaborative decision-making in the implementation of agency policy may be innovative, there is not universal agreement on the necessary components for collaborative success.

Tribal Participation in Decision-making

As collaboration in watershed management has become a more common decision-making strategy, engagement of Native American tribes in this collaboration has been less frequent than that of other identified stakeholders

(Cronin and Ostergren 2007). Yet, reserved water rights, those rights held in trust by the federal government to fulfill treaty obligations to Native Americans, has secured tribes as significant stakeholders in watershed management (Flanagan and Laituri 2004). A review of Native American writers in Native American publications found, unsurprisingly, a deep distrust of federal agencies and processes (Bengston 2004). Cronin & Ostergren (2007:533) identify key factors influencing tribal participation in collaborative management including 1) tribes' cultural connection to aquatic resources, 2) legal standing of tribe, 3) tribal and non-tribal community relationships and agencies, 4) consistency of tribal leadership, 5) recognition of value of collaboration, and 6) tribal resources. For example, the Jamestown S'Klallam Tribe in Washington, the county, and the local irrigation district forged a collaborative management plan, which was identified as successful because of the small population of the community, committed leadership of stakeholder groups, and the fear of loss of water rights (Seiter, Newberry, and Edens 2000). Cronin & Ostergren (2007:536) cite Umatilla tribal fisheries manager Gary James who remarked:

I think the irrigators have really seen a win-win partnership when they collaborate with the tribes because we've found when [irrigators] are happy...we're happy...The closest to the land are the tribes and the farmers. We acknowledged that neither is going away.

Cronin & Ostergren (2007:519) suggest that collaboration offers the opportunity for "dialogue, grass-roots organization, the potential for innovative solutions, and the pursuit of participatory democracy." Dams specifically have had profound impacts on tribal fisheries, yet Native American tribes cannot be viewed as having one voice on dam removal (Graf 2002).

Place Identity

Place identity plays a significant role in citizen participation, as each may view a river as a place to fish, and a place to swim, a spiritual center, a habitat for fish or a place to draw water for irrigation (Cheng, Kruger, and Daniels 2003;

Olstad 2007; Rogan, O'Connor, and Horwitz 2005). Cheng, et. al (2003) suggest that developing a common group understanding of place, or an understanding that each place is viewed from a different perspective, may lend itself to collective action or collaboration. Rural attitudes toward the environment may be framed through social attachment to traditional uses of the land (agricultural, ranching, hunting, fishing) as well as an environmental attachment to clean air and water (Brehm, Eisenhauer, and Krannich 2006). Change within rural areas may be influenced by local resource production, local historical events, or societal trends or a combination, suggesting that “social change at the community level may be a proxy for socio-cultural trends at larger scales” (Force, Machlis, and Zhang 2000). Values and place-identification play a critical role in the success of collaborative processes, such that “the lack of a sense of community may be the single most important barrier to a successful watershed plan” (McGinnis, Wooley, and Gamman 1999).

Social Construction of Target Populations

Schneider and Ingram (1993) suggest that the characteristics of certain social groups influence how issues get on the policy agenda, what policy strategy is utilized, and how these groups engage in the policy process. They believe that stories, history, culture, media and stereotypes define target populations and these definitions in conjunction with the power of each population, form positive or negative social constructions. Roughly, power and social perception influence policy. The category in which the target population resides is generally determinative of policy rationales, tools, messages and application. Those in an advantaged category may enjoy more benefits, than burdens, while those in the deviant category may experience more burdens than benefits. Positive construction of populations include such characterizations as “deserving,” “hard-working,” “honest,” while “dishonest,” “lazy,” and “selfish” would characterize the negatively constructed (Schneider and Ingram 1993). Constructions are often in contention, subject to manipulation, with some more enduring than others: “Dramatic events will often serve as catalysts for changes in social constructions.

When powerful, positively viewed groups become construed negatively, the dynamics of policy change dramatically” (1993:343).

Schneider and Ingram (1993) draw up four categories of target populations, advantaged, contenders, dependents and deviants, which hold different degrees of power and are either positively or negatively constructed. Advantaged populations (i.e. elderly, business) are powerful and positively constructed, having the power to shape their construction in such a way that receipt of beneficial policy may be framed as advancing the greater good, recalling the expression that, “What’s good for General Motors is good for the country.” Contenders (i.e. unions) are negatively constructed and powerful enough to soften burdens. They are viewed with suspicion, “use power to pursue their own interests...realize conflict is common” and “...believe that government is not really interested in solving problems but in wielding power” (1993:342). Dependents (i.e. children) are positively constructed but have little power, and may be viewed as helpless and needy. In contrast, deviant populations (i.e. terrorists, criminals, addicts) enjoy the unenviable position of being politically weak and negatively constructed with little control over their construction or policy, which towards then is often punitive. These target categories inform and are reinforced through the distribution of benefits and burdens.

These benefits and burdens are deployed by policy strategies that include capacity, inducement, learning, symbolic and authority tools (Schneider and Ingram 1990). Information, training, education and grants are capacity-building tools. Fines, penalties or financial assistance are considered inducements. The use of symbolic tools suggests that people are motivated by their values and beliefs. Authority tools are rules of behavior, permission or permitting, while learning tools (i.e. hearings and surveys) are used when the target motivation is uncertain.

Advantaged groups receive more benefits than burdens, including capacity and inducement tools such as subsidies and training with burdens typically limited to self-regulation or voluntary action. Contenders, powerful yet negatively constructed (greedy, corrupt, undeserving), may enjoy beneficial policy (capacity, inducements) but it will be understated and the impacts of burdens (inducements,

symbolic, capacity) overstated. Dependents (i.e. needy, deserving) are positively constructed while politically weak, enjoy little control and will receive more burdens than benefits, which may be in the form of authority tools and capacity tools with qualification (i.e. income means test). Deviants, as both politically weak and negatively constructed with no control, receive few benefits and an oversupply of burdens, largely through authority and inducement tools.

Elected officials are motivated by re-election and tend to devise policy that addresses a public problem and bears a logical connection between the goal, the policy, and the target. They contribute to, reinforce or revise social constructions, aware that beneficial policy to advantaged groups is in their political interest as is burdensome policy to deviants. Schneider and Ingram (1993: 336) suggest that, “a great deal of the political maneuvering in the establishment of policy agendas and in the design of policy pertains to the specification of the target populations and the type of image that can be created for them.”

METHODOLOGY

In order to identify and evaluate the perceived social and policy factors that condition small dam removal, a case study approach was utilized. A literature review was conducted on the key policy and social factors which are known to influence dam removal, collaborative natural resource decision-making, as well as tribal participation in natural resource decision-making. The decision to remove Chiloquin Dam on the Sprague River in Klamath County, Oregon was selected as the case.

Two primary methods were used in this study to collect information: document analysis and interviews. Primary documents analyzed include legislative records, meeting minutes, letters, meeting agendas, government reports, non-governmental organization reports, biological opinions, newspapers articles, photographic images, and maps. This information provided a historical context in the development of interview questions (see Figure 6), an aid in the

development of a historical timeline of events relating to Chiloquin Dam (see Figure 7), and a tool for data triangulation.

Figure 6: Interview Questions

Study Period 1982-2008

Would you please review the attached timeline and help me identify what events may be missing?

- In what way has the Chiloquin area changed over this period of time?
- When did you become aware of Chiloquin Dam Removal?
- When the sucker was listed did you think dam removal was a probable option?
- When and how did you become involved in the discussion of Chiloquin Dam Removal?

Social and Policy Factors

What would you identify as the key social factors affecting the decision to remove Chiloquin Dam?

- Who were the most significant individuals? Why?
- Who were the most significant organizations? Why?
- What were the most important interactions/institutions?
- What were the most significant events?
- Among these factors, which do you rank as the top three most significant?
- What role did uncertainty play?
- What role did Government play?
- What role did the Klamath Tribes play?
- What role did irrigated agriculture play?
- How has the community changed from 1982-2008?
- Have values/attitudes changed during this period and how?
- What role did the water crisis of 2001 have in consideration of Chiloquin Dam removal?
- What role does water rights adjudication play in consideration of Dam Removal?
- Was their community resistance to dam removal?
- How did the community resistance manifest?
- What were the objections to dam removal?
- How were community concerns addressed?
- How might community concerns be addressed?

Figure 6-Interview Questions (Continued)**What would you identify as the key policy factors affecting the decision to remove Chiloquin Dam?**

- Which policies affected the dam removal decision-making process?
- Which policies were an impediment?
- If funding was an issue, how?

Perspective**What have you learned from the Chiloquin Dam removal decision-making process that may help other communities?**

- How would you change the process?
- How will dam removal impact the community, fish, river and agriculture?
- How do you think dam removal will change community members view of the river and the Chiloquin area?
- What were the opportunities for public input?
- Were there adequate opportunities for public input?
- How would you describe the pace of the dam removal decision-making process?
- What were the most significant factors, which contributed to the dam being identified as an issue in 1988 and the action to remove initiated 20 years later in 2008?

Questions for the interviews were derived from the literature, the document analysis, and the key research questions seeking to elicit study participants' perceptions of the social and policy factors of the Chiloquin Dam removal decision. The use of semi-structured interviews allowed for probes, a modification of question order and explanations if necessary (Robson 1993). Informants were selected using both purposive and snowball sampling from those involved with the original listing of the Lost River and shortnose sucker in 1988, community advocates as well as those involved in the Chiloquin Dam Fish Passage Study. Twenty-one informants from governmental agencies, the Klamath Tribes, non-governmental organizations, Chiloquin community advocates, Modoc Point Irrigation District and Klamath Project irrigators (see Figure 8) were

interviewed either by phone or in person, for a period of 30 to 60 minutes during February through April of 2008. At the start of each interview, the respondents were shown a timeline of events from the Treaty of Klamath Lake Oregon in 1864 to the present (see Figure 7) in order to frame the conversation. Subjects were asked to recall past events and identify social and policy factors that they believe contributed or impeded the decision to remove Chiloquin Dam. It has been noted that such a sequential ordering of events aids in the recollection of details of specific events (Belli 1998).

Figure 7: Klamath Basin-Chiloquin Dam Study Period 1988-2008

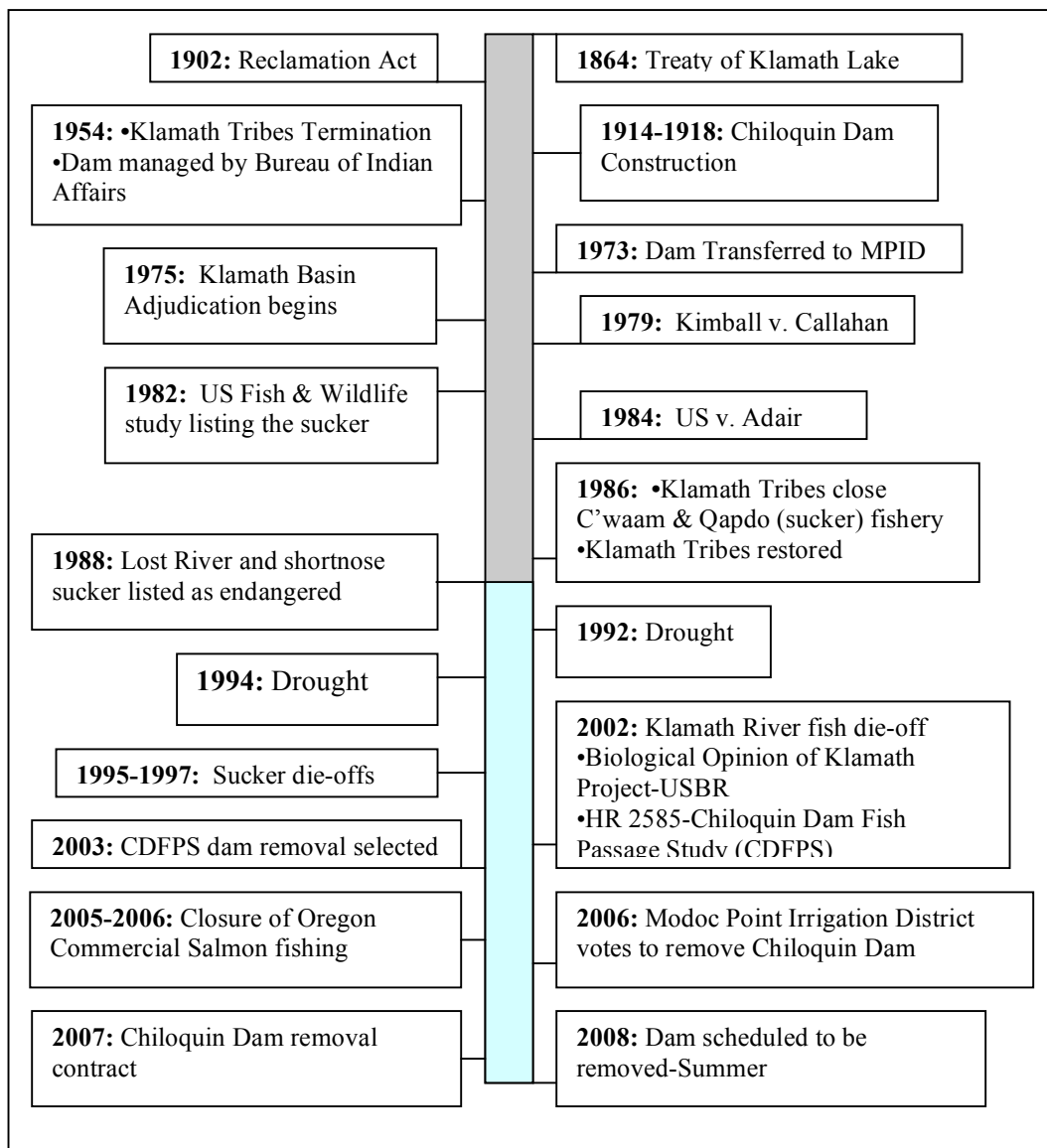


Figure 8: Study Informants by Code

CODE	CATEGORY
1	MPID
2	MPID
3	MPID
4	Agency
5	Klamath Tribes
6	MPID
7	Community
8	Community
9	Agency
10	Klamath Tribes
11	Klamath Tribes
12	Agency
13	Conservation
14	Klamath Tribes
15	MPID
16	MPID
17	Agency
18	Klamath Project Irrigator
19	Agency
20	Klamath Project Irrigator
21	Agency

All interviews were recorded with hand written notes and transcribed. These qualitative data were organized and analyzed, using selective codes as identified in the literature review as well as open codes derived from the data. Study participants' perceptions were analyzed in comparison to findings in the literature as well as within the social construction framework. While this was not a quantitative study, tables of informant responses by code are displayed throughout this paper, in order to provide a visual display of the social factors by respondents. Through this analysis, social and policy factors that influenced the Chiloquin Dam removal decision were identified and discussed in detail below.

FINDINGS AND DISCUSSION

The following are the findings from the qualitative interview data of study participants as well as a discussion of the findings as compared to the literature reviewed. The findings represent what participants perceive as the social factors

that influenced the dam removal decision. A summary of these findings may be found in Table 7.

Policy Players-*individuals or groups identified as central to ESA listing and dam removal decision*

Informants' identification of influential parties is fairly consistent with the literature and recommendations of the Heinz Center report (2002:84), which maintains that the dam owner, adjacent property owners, watershed water rights holders, local government, non-governmental organizations are important stakeholders to include in dam removal decision-making. Lubell's (2004:342) "grassroots stakeholders" of resource users are among those included in the Chiloquin Dam decision-making process. Others in the dam removal and watershed management literature speak more broadly of engaging the most diverse set or widest possible group of stakeholders (Baish, David, and Graf 2002; O'Malley-Wade 2002).

When asked to identify the key groups in the processes that extended from listing the endangered species through the decision to remove Chiloquin Dam, the two groups most often mentioned were the Klamath Tribes and the irrigators, including Klamath Project and Modoc Point Irrigation District (see Table 2). "The Klamath Tribes were a key player," noted an agency scientist (4). A community member (8) suggested, "This [dam removal] was pushed by the tribes, to improve the sucker first. I think they were the ones who initiated. And maybe the farmers downstream." One Klamath Project irrigator (18) noted that,

...[during] the 1990's [the tribe] was not in favor of dam removal. One reason was that they believed the riparian habitat upstream of the dam was inadequate. I think that the data was there to confirm that.

Table 2: Policy Players Influencing Chiloquin Dam Removal Decision

POLICY PLAYERS	Klamath Project irrigator	MPID	Agency	Community	Klamath Tribes	TOTAL
<i>Klamath Tribes</i>	2	4	4	3		13
<i>Klamath Project irrigators</i>	2	3	2	2	1	10
<i>Cong. Walden</i>	1	3	4			8
<i>MPID</i>	2	2	1	1	1	7
<i>Agencies</i>	0	2	3	1	1	7

Two irrigation groups were also identified as influential in the decision to remove Chiloquin Dam. First, the Klamath Water Users Association (KWUA) were identified as early advocates of Chiloquin Dam removal as well as the population group “that has the ear of the political community” remarked an MPID irrigator (6). Another MPID irrigator (1) said, “The Klamath Project people were for it, definitely. They are a major political party as water goes in the basin.” A conservation advocate (13) reported that Klamath Project irrigators are motivated to “make sure their water interest was protected.” Secondly, the Modoc Point Irrigation District (MPID) was recognized as “the most important group for making or breaking the project, they were the ones that owned the dam,” a community member (8) noted. One MPID irrigator (2) suggested that, “we were the biggest obstacle to dam removal.”

Irrigators and agency scientists also identified Oregon Congressman Greg Walden as a key actor in the dam removal decision as the sponsor of the *Chiloquin Dam Fish Passage Feasibility Study Act*. An agency scientist (12) said, “I think Greg Walden, the local congressman, was a major proponent [of fish passage at Chiloquin Dam].” This identification of the local congressman stands apart from existing literature, which tends to focus on those directly participating or invited to participate in the decision-making process and not a legislative party who established the process.

Events-*Specific events that influenced dam removal decision*

Subjects were asked to identify key events that contributed to the decision to remove Chiloquin Dam. More than half of the respondents identified the water shut-off to Klamath Project irrigators in 2001 (see Table 3) as a key event leading to the dam removal decision (Stanley and Doyle 2003). The event was characterized as “focusing people’s attention” and “the perfect storm.” It was suggested by some respondents that this event raised dam removal on the political agenda, creating a need to do something. An agency scientist (4) said, “I believe it took an event, you might argue, the attention directed at Klamath Basin from higher above...there was a policy scar and need to repair the damage.” A tribal informant (11) said that 2001, “Changed the political dynamics, [irrigators] realized they could not use political muscle to prevent events from affecting them....2001 was a time of great intensity, people were looking for a way out of the situation.” Many believed that the events of 2001 served as motivation to take action.

Table 3: Events Driving Chiloquin Dam Removal

EVENT	Klamath Project irrigator	MPID	Agency	Community	Klamath Tribes	TOTAL
<i>2001 Water Shut-off</i>	0	3	4	2	2	11

Doyle et al (2003) suggest that dam removals may occur in a specific policy window, and although Chiloquin Dam was identified as a factor in the species decline in the 1988 species listing, study respondents cited the water shut-off of 2001 as a key event influencing the dam removal decision. This event was driven by the ESA jeopardy listings of three species.

Policy-Policies or politics that influenced the dam removal decision

Endangered Species Act

Most of those interviewed (17 of 21), identified the Endangered Species Act as the most significant policy to influence the decision-making on the Chiloquin Dam (see Table 4). In 1988, when two species of sucker, the Lost River and short nose, were listed as endangered, both listings cited Chiloquin Dam as a potential primary cause of the species condition. Further, it stated that the dam effectively blocked upstream passage to 95% of historical sucker spawning habitat. A Klamath Project irrigator (20) responded, “When the listing happened in ’88...nobody knew what it meant, quite frankly. In 1992 was the first biop [biological opinion]...Between ’88 and ’91, the Federal Register had that Chiloquin Dam could have an impact.” Another Klamath Project irrigator (18) noted, “The Endangered Species Act underlines all this. We would not be talking about this fish if it weren’t for the ESA...” An agency scientist (12) commented:

The ESA obviously [was the key policy factor]. The fact that we are dealing with an endangered fish, the government gives it a high priority. It becomes a major motivation. When you have a conflict between traditional resource use, basically government facilitated agriculture and invited vets to take government land with water and then the ESA takes water away...that gave priority to dam removal. The ESA drove prioritization to policy to action.

Participants in this study overwhelmingly believe that the application of the ESA to the sucker species provided the rationale and motivation to drive the decision to address fish passage issues at Chiloquin Dam.

Research by the Klamath Tribes and federal and state agencies regarding the condition of the sucker led to the closure of the Oregon State sucker sport fishery in 1986 and ESA listing in 1988, which study participants’ perceived was a key policy factor in Chiloquin Dam removal decision, which is consistent with literature (Graf 2002; Bowman 2002). The ESA did not directly compel Chiloquin

dam removal, yet the jeopardy biological opinions did provide motivation to address fish passage issues at the dam (Pejchar and Warner 2001).

Table 4: Policies or politics that influenced the dam removal decision

POLICY	Klamath Project irrigator	MPID	Agency	Community	Klamath Tribes	TOTAL
<i>ESA</i>	2	6	4	3	2	17
<i>Tribal Restoration</i>	1-NO	3	4	2	1	10
<i>Tribal Trust</i>	0	0	0	1	1	2
<i>Politics</i>	1	5	2	0	2	10
<i>Adjudication</i>	1	2	2	0	1-NO	5

(1-NO, indicates where respondent believes policy did not influence dam removal decision)

After the events of 2001, the ESA listing agencies requested that the National Academies of Science (NAS) conduct an investigation as to “whether the biological opinions are consistent with the available scientific information” (Lewis 2004). The report, *Endangered and Threatened Fishes in the Klamath River Basin*, asserted that the listing agencies had chosen to focus their efforts on Section 7 and therefore the action of the ESA. The NAS committee reported:

Recovery of endangered suckers and threatened coho salmon in the Klamath basin cannot be achieved by actions that are exclusively or primarily focused on operation of USBR’s Klamath Project (Lewis 2004:344)

The NAS identified high priority recovery actions of which Chiloquin Dam removal was the first. This report was referenced by several of those interviewed.

Key sections of the ESA which influenced the Chiloquin Dam removal decision, consistent with the literature are Section 7 (the jeopardy opinions which led to the water shut-off to the federal Klamath project) and the prohibition of the taking of species under Section 9 (Bowman 2002). Section 9 of the ESA, the “take” provision, was identified as a concern by upstream and MPID irrigators. Other policies which may affect the decisions on whether to remove a dam,

include the Clean Water Act, National Environmental Policy Act, dam safety regulations and other state and federal laws which may expressly relate to the physical dam removal (Baish, David, and Graf 2002; Bowman 2002; Graf 2002), none of which were cited specifically by study participants.

Tribes and Water Policy

About half the respondents cited the restoration of the Klamath Tribes in 1986 as a policy that affirmed the Tribes as significant players in natural resource decision-making, including the decision to remove this dam. A MPID irrigator (6) said, “Restoration is a recognition of official status. They are an identified party that must be negotiated with...in a legal sense they are given standing.” A community member (8) agreed, “I would say recognition did matter to dam removal. The tribes have reorganized again. It gave them their government. I think what tribes are doing today is due to restoration of status.” A tribal respondent (14) suggested that, “Restoration allowed us to come together as a tribe, instead of just individuals.” Several respondents, including a tribal member, irrigator, community member, and several agency scientists identified restoration and the tribal trust obligation of federal agencies as influential in the decision to remove the dam. An agency scientist (4) noted that with recognition came a special obligation of the federal government, “I think once the [the tribe] was re-established, the federal government had a legal responsibility to protect tribal trust resources.” Another agency scientist (21) stated, “Tribal restoration was significant, as it was an affirmation that the treaty rights had not been terminated...[and the federal government has] an obligation to protect them as a recognized tribe.”

The Upper Klamath Basin is still in the process of adjudicating water rights and while respondents did not identify adjudication to be a major factor in the dam removal decision, some suggested it provided a context in which this decision was made. One MPID irrigator (1) suggested, “the time and immemorial claim [of the tribes] drives everything.” An agency scientist (12) viewed the Tribe’s senior water claim as a tool,

an opportunity for negotiation between different groups. The Klamath Tribes has been trying to leverage work with various landowners to participate in restoration of those lands. If you do certain things on the property, the tribes will not contest your claim.

Adjudication also came into play as Chiloquin Dam removal also included moving the point of diversion from the site of the dam to another location downstream after the Sprague River joins the Williamson River. MPID, comprised of former Indian allotments, was concerned that any change in diversion point could jeopardize their senior water right of 1864, a priority year established by the signing of the Treaty of Klamath Lake with the Klamath Tribes (since MPID land is comprised of former tribal allotments, the current landholders enjoy the water priority date of the original owners). After working with the Oregon Water Resources Department (OWRD) and adjacent Williamson River water rights holders, MPID secured a commitment that the new diversion point would not be challenged.

According to study participants, restoration after termination, federal tribal trust responsibilities, and the tribes' senior water right have all been key factors influencing the Klamath Tribes stature in natural resource decision-making including dam removal decision-making. These same factors (excluding tribal restoration) have been identified as securing a tribal voice in water management issues (Flanagan and Laituri 2004) and a seat at the table of dam removal decisions (Graf 2002). Tribal restoration is not specifically cited in the dam removal literature, which makes this case unique, yet tribal restoration also re-established the tribal trust obligation of the federal government, the responsibilities of which include protecting the tribes' traditional hunting, fishing and gathering resources. As previously noted this senior water right among tribes in an un-adjudicated basin may be viewed "as a looming threat" (Cronin and Ostergren 2007) by others within the basin. This uncertainty of water rights, tribal stature and tribal trust, in conjunction with the regulatory hammer of the ESA, appear to have provided a motivation to take action.

Politics

Political motivations were cited by almost half of those interviewed, primarily by tribal and MPID informants, as a prime reason for dam removal. An MPID irrigator (2) commented, “The Administration needed to do something and needed a quick fix to help cool things off...use this situation, fix the basin, or give the impression of fixing.” A tribal respondent (11) said, “The decision to remove the dam is political...because of the shut-off, this dam removal [was] pushed by the irrigation community and by their political backers...removal became an issue which was not just acceptable, but desirable.” Another MPID irrigator (3) said, “It was something our congressman was in favor of and something we as irrigators couldn’t stop.”

After the 1988 endangered listing of both suckers, several reports described Chiloquin Dam removal to improve fish passage including the Nature Conservancy report describing various fish passage alternatives at Chiloquin Dam (Stern 1990), engineering firm CH2MHILL providing detailed cost estimates of passage alternatives (CH2MHILL 1996), the Klamath Water Users Association (KWUA) sucker recovery action report (The Klamath Basin Water Users Protective Association 1993), and a second report which more directly called for removal of Chiloquin Dam (Klamath Water Users Association 2001). Klamath Project irrigators’ 1993 report called for additional recovery actions, habitat improvement as well as recovery benchmarks,

Scientifically objective and measurable biological criteria to determine when the sucker populations and recruitment are sufficiently high and habitat is adequate to permit down listing or delisting the species. (1993:58)

Although discussed and advocated as a potential action for sucker recovery, the dam removal idea languished, Klamath Project irrigators believe, because sucker recovery actions were focused on the lake levels, project operation and out of stream recovery efforts. Tribal respondents, MPID irrigators and some agency scientists believed the drive for fish passage at Chiloquin Dam was motivated by the interests of Klamath Project irrigators and the political drive to get relief for

them. An agency scientist (21) suggested that, “If the Klamath Project didn’t exist, we wouldn’t be taking this dam out.”

In the aftermath of 2001, the Chiloquin Dam removal, long championed by Klamath Project irrigators, was pushed to the fore. Seven respondents cited as significant the authorizing legislation for the fish passage decision-making process, *the Chiloquin Dam Fish Passage Feasibility Study Act*. This law directed the Department of Interior to work with the Oregon Department of Fish and Wildlife, the Klamath Tribes, Modoc Point Irrigation District, and others to study and recommend within one year to Congress a fish passage alternative at Chiloquin Dam. In addition, the Act required an “examination of mitigation needed for upstream and downstream water users, and for Klamath tribal non-consumptive uses” (Chiloquin Dam Fish Passage Feasibility Study Act 2001). Yet, in terms of political dividends, agency and tribal respondents believe Klamath Project irrigators’ wanted an immediate de-listing of the species, an action that was not expected. Politics is recognized in the literature as influencing dam removal decisions but is cited as an obstacle to dam removal (Pejchar and Warner 2001), not facilitating it as is the case here.

Despite the collaborative process of the Chiloquin Fish Passage Study, which was framed as analyzing the various alternatives and providing a recommendation, it was believed by virtually all MPID members interviewed that dam removal was a pre-determined decision. “As long as you look at the political, it became clear that dam removal was it,” remarked one MPID irrigator (3). Another MPID irrigator (1) noted, “Once we understood that this was a goner, we had to get on board.” An MPID member (15) commented:

This was all a done deal, which was done in Washington DC...It was a top-down process...I don’t mind the pumping station [and] don’t mind the dam removal...Let everybody know why. This is for the lower basin water users. This is to get land back for the tribes. You explain to people and they will get it. Probably the dam should go. For our

irrigation district, [we] had a lot of maintenance and repair.

It was a liability. Safety is a reason.

Another member (2) added, “In my opinion, the government wanted the dam out and had enough money to go around, had enough oil to stop the squeaks...then it could happen.” A tribal respondent (10) suggested that the “Public was not real involved in dam removal decision. I think it would have happened even if the Klamath Tribes did not want it to happen.”

In this case, the intimation is that this process was driven more by politics than science, particularly through the support of a politically powerful group. Was the authorizing legislation structured to achieve dam removal? It would be difficult to divine that motivation from the remarkably brief (less than 300 words) piece of legislation (HR 2585). The bill defined those to be involved, the duration of the study, and the goal requiring mitigation be identified. The goal does not specifically cite the target species (sucker) but more broadly defines “fish passage” as applying to fish in general. This general mandate for fish passage may significantly change the design of fish passage alternatives and raise the cost of any alternative other than removal. Expecting a report back in one year seems intent on arriving at a response in what some may hold a brief period of time. The composition of decision-makers, Oregon Department of Fish and Game, the Klamath Tribes and Modoc Point Irrigation District, identified those with a legal stake in the decision-making of Chiloquin Dam. The examination of mitigation options strives to find ways to make fish passage possible without harming existing irrigation uses as well as being responsive to tribal in stream water needs. The legislation that established the duration, general goal (the economics and science of achieving it), mitigation needs, as well as the composition of those stakeholders, also provided the legislative parameters that resulted in dam removal as the preferred alternative.

Tribal and MPID informants perceived the dam removal decision as not only political, but a pre-determined action by elected officials that would have occurred even if MPID irrigators or the tribes disagreed. This reflects the anxiety of other dam removals where the decision is believed to be made by outsiders and

fostering a sense of helplessness in community members (Born et al. 1998; Johnson and Graber 2002). The suggestion of a pre-determined decision did raise anxiety in the Chiloquin case, but it manifested itself in an internal MPID dispute over whether the final mitigation package was adequate and a reaction among some tribal members that the government was intent on taking something else from them (i.e. a dam originally constructed and paid for by the tribe).

There is ample testimony that the water shut-off of 2001, guided by the implementation of ESA jeopardy opinions led to a social and political crisis, while trying to avoid an endangered species crisis. One political response included a target of fish passage at Chiloquin Dam. Even though this was a political response it does not necessarily mean that the effort is without environmental and social benefits.

Knowledge- *Knowledge or uncertainty and the impact on dam removal decision*

One of the central themes that emerged from the interviews was respondents' perception of the lack of scientific information regarding the status and condition of the sucker as well as the ecological consequences of dam removal itself (see Table 5). Eleven of those interviewed made reference to this lack of knowledge as influencing the decision to remove the dam, while three others made reference to hearsay, and some asserted that the uncertainty impacted the length of time from species listing to dam removal decision. Questions raised about the life cycle and habitat needs of suckers drove researchers to pursue additional information to develop a better understanding of what affected the species decline and what would improve its condition. In the course of this research, gaps in the knowledge remained. A tribal respondent (10) said,

I think that people don't know about the fish. There was very little information, not like the research on salmon and red band trout with a lot of scientific information. This fish was endemic to here, only place in the world it is found and not enough information. We had a lot of ground to make up, to understand the life cycle.

An agency scientist (17) asserted, “There was very little knowledge of the fish...” Regarding the impact of dam removal, an MPID irrigator (1) said, “If we take the dam out, a question was, what does that do to the spawning grounds one mile before the Williamson River?” A tribal respondent (11) noted regarding the dam removal decision process, “There were questions...after we take the dam out, what about sediment or contaminants in the sediment?”

Table 5: Uncertainty & lack of knowledge influential to dam removal decision

UNCERTAINTY	Klamath Project irrigator	MPID	Agency	Community	Klamath Tribes	TOTAL
<i>Uncertainty-Dam Removal effects</i>	0	2	3	1	3	9
<i>Uncertainty- Fish Knowledge</i>	0	1	3	0	2	6
<i>Rumors</i>	0	4	1	0		5

One consequence of this scientific uncertainty was skepticism and distrust among respondents regarding the scientific information upon which recovery actions (including dam removal) are based, as well as doubt regarding the motivations underlying the removal decision. An agency scientist (12) said,

Some of the landowners probably still don’t believe [the sucker is endangered], there is always that group but most of them believed there was a lot more potential for improving conditions.

An MPID irrigator (16) suggested that scientific uncertainty may have been backfilled by political imperative, “I think...the sucker studies should have been concluded before the decision [dam removal]...they had guys/kids doing studies, they were college kids, it wasn’t political with them.” This uncertainty has led to hearsay and rumors among some MPID irrigators (3), “There was someone who said they had filmed a large spawning of the sucker above the dam...there was apparently video, but I never saw it.” Another irrigator (1)

suggested the sucker “die-off was always part of its life cycle.” A government representative (19) relayed, “...even after the shut-down, people [were] saying you can find suckers...just need to know where to find them.”

Doubt about the scientific information has fueled “a competition about the science,” suggested an agency scientist (21). One MPID irrigator (2) felt that tribal and government scientific information is a tool that puts them at a disadvantage within decision-making, “This dam may be honest, [but] we had to rely on government studies...The Klamath Tribes have biologists and the US Fish and Wildlife has biologists...they have more scientists then we do...” A tribal respondent (10) explained how, in an atmosphere of uncertainty, the dam could be the identified as the reason for and the solution to the sucker decline:

I think the dam got picked out because it was the most prominent feature in the area. They could point to it.

Everyone understood the history of it. It was the easiest thing to explain, even when people did not understand.

An agency scientist (21) expressed the uncertainty of the dam removal impact on species recovery, “We can’t definitely say, can’t quantify...but there is consensus that this will improve passage.”

A fundamental lack of information regarding the endangered sucker species was acknowledged early in the 1988 listing of the species: “Causes of the decline are varied and not clearly understood” (United States Fish and Wildlife Service 1988). While scientific information is critical to dam removal decisions, a dearth of information creates a substantial challenge to decision-makers (Sarakinos and Johnson 2002; Johnson and Graber 2002). This was certainly the case with Chiloquin Dam, as other recovery efforts took precedent to dam removal prior to 2001. Agency scientists acknowledge that the only thing guaranteed in dam removal, is that a barrier to upstream passage will be eliminated, all else is unknown.

While there was concern about the ecological consequences of dam removal another significant focus of uncertainty in the Chiloquin Dam case was

the lack of knowledge of the status and recovery needs of the sucker. This uncertainty is not unusual when dealing with endangered species:

Decision makers are often forced to make choices without adequate science, especially in areas related to endangered species. Because for many species researchers are still unable to define how much habitat is required for species survival, it is not possible to manage river landscapes with definitive areas for the benefit of species (Graf 2003).

The uncertainty of sucker science has generated consequences: MPID irrigators feel at a decision-making disadvantage, and rumors and suspicion fill the gaps in their knowledge. Pejchar and Warner (2001) characterize the second most significant barrier to dam removal after politics as this lack of information. The prime ecological concern suggested by informants related to dam removal was the condition of upstream habitat and the impact of sediment release on downstream, including on the spawning grounds. This latter concern is consistent with that expressed in the literature regarding the composition and impact of sediment release (Bednarek 2001; Pizzuto 2002; Stanley and Doyle 2003), while the former is recognized as well.

While agency scientists and tribal respondents acknowledge the uncertainty regarding endangered species, it remains a sense of frustration in the irrigation community. In the future, this may compel stakeholders to require even more certainty for dam removal (O'Malley-Wade 2002) (i.e. that species recovery will result) a reflection of some irrigators' views that recovery efforts have been tantamount to groping around in the dark looking for the light switch, or as one irrigator (18) suggested, "random acts of restoration." Irrigators' exasperation is exacerbated by the long time line generally required in which to understand the impact of any or a combination of recovery efforts, with no immediate species rebound from any one effort including dam removal.

Concerns-Concerns regarding dam removal

Respondents raised several issues related to the removal of the Chiloquin Dam including the economic protection of irrigators, liability for injury at the dam, and the loss of recreation and habitat (see Table 6). These concerns are discussed in some detail below.

Modoc Point Irrigation District

The concern most frequently mentioned, by 13 of those interviewed, was the interest of the Modoc Point Irrigation District (MPID) to be made whole, so that they would not bear the cost of the dam removal, the installation of the pumps, nor the funds to provide ongoing operation and maintenance. “You have a free gravity flow system at low or no cost for irrigation, why do you want to change?” asked one MPID irrigator (3). An agency scientist (12) said:

The other challenge was that the dam did serve a function. It was a water supply for 6000 or so acres of agricultural land.

A challenge was how to minimize the impact to the irrigation district.

The concerns expressed by study participants are generally consistent with the literature. Sarakinos and Johnson (2002) identify concerns related to economic/cost, ownership of exposed lands, recreation and aesthetic concerns as most common; in this case neither ownership of exposed lands nor aesthetic issues of the river after dam removal were raised by informants. Economic concerns (Born et al. 1998; Graf 2002; Baish, David, and Graf 2002) are a common factor in consideration of dam removal, and in the Chiloquin case the economics of the dam operations and maintenance was cited as a consideration for the MPID in any resolution to fish passage at the dam. The impact of dam removal on property values also noted in the literature as a common concern (Baish, David, and Graf 2002; Graf 2002), and in relation to this case, the concerns expressed were questions of the impact on downstream property owners after the sediment discharge and two MPID property owners who would be above the new pumping station. The City of Chiloquin wanted assurance that they would

not bear the cost of any damage that may occur to city streets from transporting dam material.

Liability

Respondents also identified liability from potential injury with the deteriorated condition of the dam, protection from endangered species “take “ at the new pumping station, and the downstream impact of sediment released after dam removal as three different liability issues. One MPID irrigator (6) outlined the safety issues,

Because we have 90 years and sometimes three generations of people who used it [Chiloquin Dam] for recreation, the fish ladders have been used as slides. Jumping off the dam is one thing to do in summer...All it takes is one kid getting caught in the sluice gates. There are so many ways to have a serious injury or death.

Four of those interviewed shared the concerns of Upper Sprague River irrigators above Chiloquin dam (not MPID members), who feared liability of endangered species “take” since the dam would no longer prevent upstream passage of sucker. A Klamath Project irrigator (18) suggested, “We supported removal...provided that upstream irrigators were given resources and assistance to improve habitat and some sort of safe harbor [from species “take”].” An agency scientist (21) also recognized this concern, upstream irrigators “did not support dam removal because it would bring fish into their backyard. You [these irrigators] already have a problem and a responsibility.”

The security and safety of a dam facility is recognized as a common concern (Graf 2002) in small dam removals, with safety being a prominent reason for dam removals (Pohl 2002). In noting the liability they bore in the event of an injury, several MPID irrigators expressed this as a concern and a motivation to address fish passage at the dam. ESA related concerns are specifically noted in the literature and recognized as one measure to influence participation in stakeholder processes (Graf 2002; Pejchar and Warner 2001).

Recreation

The Klamath Tribes and the City of Chiloquin expressed concerns about recreational activities that currently occur at or around the dam. Ten respondents cited swimming recreation, while another eight identified tribal fishing and gathering as concerns. One tribal respondent (14) commented:

We were split on removal...there were a lot like me, raised fishing and swimming and using the area as a social gathering area...we just brought up [to the general assembly of the Klamath Tribes] that there was social gathering before the dam and there will be social gathering after the dam.

An agency scientist (4), however, suggested that the dam was not “a primary recreation site...there are other recreation sites.”

Concerns regarding changed recreation activities are common among dam removal communities (Sarakinos and Johnson 2002; Graf 2002; Born et al. 1998). In the Chiloquin case, the reservoir above the dam was used for swimming and the dam has served as a recreational, albeit unsanctioned, structure from which to jump into the water (see Figure 9). The area below the dam has developed into a fishery and the potential loss of a fishing access was an arena of contention among tribal members. The recreation concerns were acknowledged, though that did not seem to substantially alter the outcome of the dam removal decision.

Figure 9: Chiloquin High School Journalism Class at Dam-1978



Source: Chiloquin High School Yearbook-1978

Habitat

A key concern among all parties was the condition of the upstream habitat (a primary concern of the Klamath Tribes) and the impact of sediment behind the dam on downstream habitat. A community member (7) commented that there was, “Tribal resistance to dam removal, ambivalence in the tribe, did not want c’waam [Klamath for Lost River sucker] to go upstream to poor habitat.” An MPID irrigator (2) expressed, “Our main concern...is we did not want to be held liable from other folks down river for silt and sediment.” Based on these concerns the United States Bureau of Reclamation (USBR) conducted a sediment discharge model for which, “There was a high level of confidence that within a year it would clean out...[they] studied whether there were toxic materials to be concerned about and there were not any, ” reported an agency scientist (12). The Chiloquin Fish Passage Study found that the Sprague River had the capacity to transport more than 3.3 times as much sediment as was currently stored behind the dam (United States Department of Interior 2003).

The degradation of habitat has been acknowledged as an impact from the construction of dams (Born et al. 1998; Hewitt, Graber, and Lindloff 2001) and consideration of dam removal should weigh the impacts on existing habitat (Graf 2003), such as how the sediment released will impact downstream habitat. Concern regarding access to habitat drove this decision-making process through seeking a recovery action for the sucker, while the condition of the habitat upstream and downstream was mentioned by a cross-section of respondents.

Other concerns noted by Sarakinos and Johnson (2002) include: the river drying up, increased flooding, former reservoir becoming a mudflat, the government seizing land, the former reservoir hosting viruses, and a loss of a historical structure. Study participants did not express these particular concerns, yet the removal of this historical structure was believed by some tribal members to be another example of a government take away, on something for which they had paid, reported one tribal respondent (10).

Table 6: Concerns Raised by the Removal of Chiloquin Dam

CONCERNS	Klamath Project irrigator	MPID	Agency	Community	Klamath Tribes	TOTAL
<i>MPID</i>	2	5	2	2	1	12
<i>Recreation</i>	1	4	3	1	1	10
<i>Habitat</i>	1	4	2	1	1	9
<i>Liability</i>	1	3	3		1	8
<i>Cultural</i>	0	1	1	0	4	6
<i>Chiloquin Streets</i>	1	2	1	1	0	5

Other concerns noted by Sarakinos and Johnson (2002) include: the river drying up, increased flooding, former reservoir becoming a mudflat, the government seizing land, the former reservoir hosting viruses, and a loss of a historical structure. Study participants did not express these particular concerns, yet the removal of this historical structure was believed by some tribal members to be another example of a government take away, on something for which they had paid, reported one tribal respondent (10).

Place Identity-Role of Chiloquin Dam and Sprague River sucker fishery in characterization of place

The Chiloquin Dam and the sucker fishery are two components of the identity of this area; the first is the role of the Dam and swimming hole, as a gathering place, and second is the value placed on the sucker itself. Chiloquin Dam has been in the Sprague River for more than 90 years, as long as most long time area residents have been alive as one agency scientist (12) noted, "...almost like it was a natural feature." A tribal respondent (14) referred to the area around the dam as a "social gathering area." Another tribal respondent (10) described the dam as,

part of the community since Chiloquin was built...It did create new fisheries that were beneficial at some level. New spawning grounds for red band trout and sucker. The fishing site before [the dam] was upstream of dam. Below the dam is

[a] new site, [and the dam] created that habitat. It was a new fishing opportunity for those without transportation, [they] could catch fish for dinner...[on the] Recreation side, every kid in Chiloquin because of proximity to school, hung out there, swam in it, maybe had first love there. That area was always used.

This concept of a social gathering around the dam is further reflected in the growth of the recreational sucker snag fishery that reportedly drew people from around the country to Oregon, according to a tribal respondent (5),

It was the only sport snag fishery in the whole state... in spring, they would all line the banks, hundreds of people, they would set up camps with pick-ups...it was a festival atmosphere...depending on when the weather got nice and [they] would stay for up to a month.

One Klamath Project irrigator (20) added how the sport fishery was not for consumption but for the catch:

Quite a few of us were around during the [sucker] snag fishery when people would be crowded around there and would pull them [the sucker] and throw them on the bank and dump them in the trash. It stunk with all those fish on the banks.

A tribal member (14) shared a different memory:

My earliest memory of the Chiloquin Dam was before I was of school age. I was going there with my parents and my grandparents to picnics and to fish for trout and suckers... They called our fish trash, garbage, but my memories were of a light and delicate meat.

These testimonies provide an account of the different reference points that local residents and visitors have for this place, Chiloquin Dam on the Sprague River. It was an area for recreation, a gathering place, a place for sport and subsistence fishing, and a sacred place for the Klamath Tribes as well as a place

of irrigation diversion. These differences about how one relates to place are observed in how informants describe the fish itself. The Lost River Sucker referred to as c'waam by the Klamath Tribes, and short nose sucker also known as qapdo, are revered by the Klamath Tribes but characterized by several non-tribal informants as a trash fish. An MPID irrigator (16) said, "Suckers were considered a trash fish, people would spear them and leave them on the bank...you would rather have a trout than a sucker." Another MPID irrigator (15) said, "this is an ugly boned bottom fish, a trash fish, not an exalted fish...(the Klamath Tribes are) using it as a political ploy. It was not a food source." An MPID irrigator (3) shared that "when we were kids, we thought of the sucker as a trash fish. We would catch it and leave it on the bank...It was for the catching not the eating."

Characterizations of the sucker/c'waam as a trash fish by irrigation respondents suggests a very different relationship with this aquatic resource than that reported by tribal informants. An agency scientist (21) suggested,

The stigma attached to suckers, most people thought of as trash...these fish do not exist anywhere else in the world...they were a staple source of food, when this tribe was subsistence [living].

A tribal member (14) relayed a conversation with a non-tribal member:

I asked a guy, why do you call it a trash fish? He told me he caught the fish, cut it open from the underside, pulled the guts out, cleaned it up and cooked it. He said it tasted terrible. I thought it had to be something with the processing. Well, we clean the fish from the top, through the back. If you cut from the anus, forward you cut open the gall, which opens up and contaminates the meat.

Another tribal member (10) added, "Trash fish? That is really insulting to our tradition."

An agency scientist (17) suggested that the difference in assigning a value to a fish or a place could be based on the individually assessed utilitarian value, which may in turn prioritize the protection of those resources and that place:

...we just don't know about the species and if we don't see it as directly useful...even resource agencies, game fish or non-game fish, defining it as what it is not. We have a lot of ways in society of relegating to secondary or tertiary status.

There are shared views of the area being a gathering place, yet there are disparate views on the value and purpose of the aquatic resources. It is asserted that a common understanding of place or acknowledgement that place may be viewed differently for different persons may lend itself to collaboration (Cheng, Kruger, and Daniels 2003). In this case, various stakeholders acknowledge different perspectives on Chiloquin Dam and the sucker, but that did not appear to be a social factor limiting a dam removal decision. Experiences with the dam and the Sprague River provide the basis for having a stake in the dam removal decision. It was undisputed that irrigation among respondents would continue and that fish passage was the central goal of the collaborative process, even while the central relationship to place may be based on differing values.

Collaboration-Role that collaboration played in the dam removal decision

A collaborative process was assigned to the Department of Interior to administer under the *Chiloquin Dam Fish Passage Study Feasibility Act* (Chiloquin Dam Fish Passage Study-CDFPS). The Department of Interior assigned the collaborative process to the Bureau of Reclamation and the Bureau of Indian Affairs with the participation of invited stakeholders. In the course of the interviews, informants discussed four areas of collaboration including expectation, alternatives, decision process, and mitigation.

Expectations-What expectations did participants in the CDFPS have for dam removal?

Participants in the *Chiloquin Dam Fish Passage Feasibility Study* were asked to help identify and consider a range of fish passage alternatives at Chiloquin Dam and recommend a preferred alternative. Study informants reported that, "with different participants there were different expectations," as stated by

an agency scientist (12). An MPID irrigator (6) declared, "...everyone has a motive." This irrigator added, "if we don't do anything, all it takes is a declaration [of critical habitat] by Fish and Wildlife...and they could shut us down." Study participants perceived that MPID irrigators expected that whichever passage alternative was selected, their irrigation system would continue to deliver water, they would incur no additional costs ("remain whole"), and they would maintain their senior water right. Another MPID irrigator (1) said

for MPID the arguments for removal were economic with the ditch problem, the probability of a lawsuit, the political hand writing was on the wall, a liability with suckers and kids swimming up there...This little dam, for me, is an economic decision.

Dam removal provided an opportunity for MPID to address their irrigation system weaknesses.

One MPID irrigator (6) suggested that the Klamath Tribes were motivated to improve upstream habitat, while another MPID irrigator (1), reported what most other irrigators interviewed believed as the root of tribal motivation, "any political pressure in order to get [a] natural resource base." A government representative (19) suggested that all parties were motivated by "Klamath Basin fatigue...people realizing that they were not getting anywhere fighting, so we need to try something else."

An agency scientist (21), community member (8) and MPID irrigator (6) agreed with this tribal respondent's tribal (10) assessment of Klamath Project irrigators' motivation, "trying to figure out a way to get the fish de-listed." Agency scientists and tribal respondents believed that that for Klamath Project irrigators, recovery actions taken, including improved fish passage at Chiloquin Dam, would result in relief from the Endangered Species Act, such as de-listing (removing endangered protection) of both sucker species. A government representative (19) said, "whatever they (project irrigators) do, they wanted to get the sucker de-listed...but the Klamath Tribes wanted it (the sucker) back...to get them back to a harvestable level." A tribal respondent (10) added,

Every time there was a restoration done [by irrigators] they would say, ‘look what we have done for fish’...the Ag community feels they have been shortchanged for credit for those projects, Tulana farms, the Wood River

A Klamath Project irrigator (18) offered when asked of this perceived expectation, “we got it.”

It was this expectation that dam removal may lead to or equate with immediate recovery that concerned this tribal informant (11), “While dam removal is clearly the best thing for the fish, it is not a silver bullet to instantly recover [the species]. A case of the right thing for the wrong reason.” Agency scientists (17) agreed, “I don’t think any of us thought that dam removal would be it. There are habitat and water quality issues as well. [The] Dam was one item to be done.” The tribal respondent (11) described that in the collaborative process there was

a successful effort to educate about the impacts of removal and the upstream habitat issues which will not be changed by the removal itself. Those with an expectation of an instantaneous effect may have come around.

As described above, Klamath Project irrigators were perceived by others to be involved based on the threats involved with ESA listings and Klamath Project irrigators’ expectations for participation (i.e. “delisting the sucker”) reflect this driver of involvement (Pejchar and Warner 2001). In addition, irrigators are concerned that any changes in law, policy or even the dam itself are likely to have adverse impacts on their interests, including their economic interests (Leach, Pelkey, and Sabatier 2002). These additional motivations are reflected in this case, as MPID seeks to be made economically whole and shed deteriorating parts of their irrigation system. The Klamath Tribes are participating to protect their watershed approach philosophy and the understanding that this recovery act is one of many necessary to improve the species (Stanley and Doyle 2003). Tribal participation in this collaborative process is consistent with the Cronin and

Ostergren (2007) key factors including cultural attachment to aquatic resources and legal standing of the tribe.

Decision Process-How did informants perceive the decision-making process?

While almost all of the MPID interviewees believed that the decision for dam removal was pre-determined, more than half of those were also complimentary about the outreach efforts to stakeholders and the general public regarding participation in the decision-making process. “We had those meetings, stakeholder meetings and anybody could attend...there was a lot of advertising,” commented one MPID irrigator (2). A community member (8) said, “There were public meeting announcements in the paper, groups were involved.” Some criticism leveled at the decision making process by MPID members suggested it was not a totally open process; in particular the process of sharing information with MPID members by MPID representatives was considered inadequate. These critics believe that the ultimate deal may fall short of providing enough funds to pay for operations and maintenance in perpetuity. A tribal respondent (11) had no criticism of the process but described the process with a question, “how can you argue with success?” A conservation community member (13) called it “win-win,” another tribal respondent (5) regarded “collaboration as the success.” An agency scientist (4) determined that, “The study provided a unique opportunity for folks who might be in opposition, in a collaborative effort to get to an agreement.”

The Chiloquin Dam Fish Passage Study stakeholder group had a clearly defined goal of improved fish passage, established in the authorizing legislation, which is often cited as a requirement for successful decision-making process (Johnson and Graber 2002). Further, Johnson and Graber (2002) advise providing significant scientific and technical information to adequately address the alternatives. While some expressed skepticism of government provided scientific information, respondents overall spoke to how dam removal was the best of the alternatives considered with the information available. This incomplete science and uncertainty has been noted as a significant issue regarding small dam removals (Sarakinis and Johnson 2002; O'Malley-Wade 2002).

It has been argued that successful collaborative processes lead participants beyond their specific interests to a greater community interest (Singleton 2002). It is suggested that a collaborative process may reduce conflict, build relationships (Conley and Moote 2003) and build trust (Kenney 1999; Lubell 2004; Schusler, Decker, and Pfeffer 2003), which is viewed by some as an essential element. Others contend that it is a mistake to see collaborative processes as one which is devoid of politics or self-interest, when these two factors are intrinsic to the processes (Walker and Hurley 2004). The Chiloquin case was described as a “success” and “win-win” by respondents, yet Klamath Project irrigators, the Tribes and MPID came to the table with specific interests and motivations, as well as beliefs as to what the other party wanted in the process. It does not appear that any of these understandings that each group has of the other or their stories would add up to trust but this was not a barrier to cooperation (Raymond 2006) nor perceived success. This finding may be limited as overwhelmingly those interviewed for this study were “inside the room” as the decision was made.

Mitigation-What was considered to replace Chiloquin Dam “services”

The largest direct impact of dam removal would be to Modoc Point Irrigation District since the dam has served as a free gravity flow irrigation system with a very senior water right. More than half the respondents, agency, community members and irrigators alike-cited the need for MPID to remain whole. An agency scientist (17) said, “There was wide support for continuing to fulfill the dam’s role...I don’t think there was anybody speaking out against that use if you can find an alternative through pumping.” Another agency scientist (21) reported, “The [MPID] District looked at it and they came to, ‘we will agree to dam removal if we can remain whole. We don’t want to have to pay the cost of dam removal or raised cost of operations.’” An MPID member (2) said, “We were looking to negotiate dam removal, design of removal, a timetable and who pays...in reality it [dam removal] was good for the district, everything will be improved.”

The intention of the study group was to assess alternatives for fish passage at Chiloquin Dam, and for the “great majority of time in review, we are talking about fish ladders”, recalled an MPID irrigator (6). However, as a conservation advocate (13) remarked, “dam removal was the only thing that made sense.” Ultimately, the dam removal alternative was selected, which provided for abandonment of several miles of troublesome diversion canal, installation of a new pumping station (changing the point of diversion), and installation of pumps to service two MPID members who were above the new pumping station. Further, an endowment fund was established which the District could draw upon, funding in perpetuity the ongoing operation and maintenance of the pumping plant.

Additional efforts sought during this discussion were mitigation for the impact to Chiloquin’s city streets as dam material moved through town in heavy trucks, a swimming pool to replace the loss of swimming hole above the dam, and improved upstream habitat conditions. The City of Chiloquin secured an agreement to repair any damage that is incurred to their streets. It was decided not to provide a swimming pool because there were alternative recreation sites. Regarding the habitat an MPID member (6) recalled “assurances from Fish and Wildlife that there will be a shift in focus/funds.”

Despite the belief that the impetus for dam removal was to serve Klamath Project irrigators, many received benefits. MPID saw an opportunity to be rid of parts of a faulty irrigation system that presented significant liability issues to the district, consistent with the safety, security and maintenance issues identified in other dam removals (Sarakinis and Johnson 2002; Born et al. 1998; Doyle et al. 2000). In addition, tribal respondents who saw political motivations behind dam removal identified potential gains for the endangered cw’aam with commitments to upstream habitat improvement and the downstream impact of sediment discharge on spawning habitat addressed. The Tribes received assurances of additional funds directed to habitat improvement. This mitigation package brought people along in the process and made fish passage through dam removal acceptable.

Duration-Factors that contributed to duration of time between species listing to dam removal decision

When asked directly about why it took so long from species listing in 1988 to dam removal action in 2008, there was no overarching consensus among respondents. One MPID irrigator (3) offered, “You had to get everyone on board, all the arrows pointed in the right direction. Maybe the science was certain enough, but why did this not come up during Clinton’s time?” An agency scientist (17) added, “I think these things, they take a lot of time, roughly twenty years...there is not a lot of experience on dam removal...takes a lot of studies. Twenty years does not sound like an excess amount of time.” A Klamath Project irrigator (20) suggested:

I think it lost its focus from regulatory agencies, as restoration was not in the river, but in the lake...part of that was the biological reasons, since a lot of information was being developed for Upper Klamath Lake Claim in adjudication.

A government representative (19) added that with the Endangered Species Act, “if you list something the recovery plan is really slow.” A community member (7) offered that:

there was a lack of organization early on...As more of this affected downstream [communities], water users, fisherman all this added pressure. It took enough time to build. The timing is right. If this was proposed 20 years ago, it would probably not happen.

And one respondent, an MPID irrigator (6), believed that a twenty-year time line is the incorrect measure, the “real time-line starts in 2001...once it is identified, you can do it in 6-7 years. This is a short time.”

It has been suggested that dam removal takes about four years from decision to action (Baish, David, and Graf 2002) and Chiloquin Dam will be close to that timeline from final decision to remove in 2003 to actual removal scheduled for summer of 2008. Many informants do not believe that the duration of time

from identifying the dam as factor in species decline in the 1988 ESA listing to the scheduled removal is too long, given the inherent scientific uncertainty of species recovery. Further, the social factor of a privately owned dam that continues to be used for irrigation diversion complicates any expeditious dam removal. A combination of factors appear to have contributed to the duration of this dam removal: the uncertainty of sucker science, a focus on project operations, the lack of political impetus to prioritize fish passage or removal at Chiloquin Dam and competing understandings whether this was the one act of recovery or one nested within larger recovery effort.

Table 7: Summary Findings

Policy Players Klamath Tribes Klamath Project Irrigators Congressman Greg Walden Modoc Point Irrigation District Federal Agencies State Agencies
Event The shut-off of water to Klamath Project 2001
Policy The Endangered Species Act Tribal Restoration, Tribal Trust Politically driven decision, pre-determined in Washington DC Chiloquin Dam Fish Passage Feasibility Study Time and Immemorial water right
Place Chiloquin Dam as a gathering place Sucker/Cw'aam as Trash or Sacred Fish
Knowledge Uncertainty about dam removal Uncertainty about sucker science Rumors

Concerns MPID loss of gravity flow irrigation Liability Loss of recreation-fishing and swimming Degraded habitat above the dam, sedimentation composition and release Impact on cultural gathering spot Dam removal impact on city streets
Collaboration <i>Expectation</i> Klamath Project irrigators: de-list species Klamath Tribes: improve upstream habitat, dam removal not silver bullet Modoc Point Irrigation District: fish passage at no cost to district <i>Alternatives</i> Dam removal selected MPID respondents believe was pre-determined alternative <i>Decision Process</i> Participants believed good outreach, advertising, collaboration <i>Mitigation</i> Modoc Point Irrigation District: dam removal, new pumps, o & m fund Klamath Tribes: additional monies to upstream habitat improvement
Duration Lack of focus (politics) Little knowledge on sucker (knowledge-uncertainty) Recovery focus on lake and project, instead of in stream(politics) ESA takes time (policy) Competing expectations of what Chiloquin Dam removal

Social Construction of Target Populations

The social construction of target populations will be used as a framework for analyzing the distribution of policy and impacts on parties involved in the Chiloquin Dam removal decision. As described previously, those cited as having the most influence in the dam removal decision are the Klamath Project irrigators, the Klamath Tribes, the Modoc Point Irrigation District, government agencies, Congressman Walden, conservation groups, and the Chiloquin community, with the most emphasis by respondents on the first two. In consideration of this framework, the following alignment of social constructions is suggested in Table 8:

Table 8: Social Construction Chiloquin Dam-Local Perspective

POWER Strong ↑ Weak ↓	POSITIVE <i>ADVANTAGED</i> Klamath Project irrigators Modoc Point Irrigation District	NEGATIVE <i>CONTENDERS</i> Conservation Groups Klamath Tribes
	<i>DEPENDENT</i> Chiloquin Community	<i>DEVIANT</i>

Irrigators

Klamath Project irrigators have been described as the population group with the most influence and power in the basin. Since the 1902 Reclamation Act led to the construction of the Klamath Project, more than 200,000 acres are now under irrigation. Project farmers organized as the Klamath Water Users Association (KWUA) in 1953, forming a very powerful political entity in the Klamath Basin, contends an MPID irrigator (1), “They are a major political party.” Another MPID irrigator (6) suggested “That is the political wedge, that is the population group that has the ear of the political community.” Prior to the organization of KWUA, project irrigators were lured to the basin by inexpensive land and irrigation water projects to support that land, relying on this government program as a dependent social construction. After growing influence and the

development of KWUA, Klamath Project irrigators as perceived by other study participants, can be described as Advantaged. MPID, as part of the irrigation community, may also be viewed as an advantaged group in this framework with more than 5,000 irrigable acres and as owner of Chiloquin Dam. Advantaged populations are positively socially constructed and politically powerful. They enjoy a significant amount of control over their social construction as well as the policy applied to them. Burdens are undersubscribed and benefits oversubscribed (Schneider and Ingram 1993).

Klamath Tribes

Prior to the signing of Treaty between the Klamath Tribes and the United States in 1864, in the social construction framework the tribes were negatively constructed and politically weak, considered “deviant.” Deviants are negatively constructed, wield little power, enjoy no control over policies and are subject largely to inducements. The inducement in this case was land for peace. The 1864 treaty with the United States resulted in a dramatic reduction in land base from an estimated 23 million acres to less than 2 million acres as well as consolidating three tribes traditionally at odds on one reservation. The treaty marked a “transformational event” where social constructions may change, where the cultural characterizations can change, and the tribes may be considered socially constructed as a “dependent” population. Dependents are positively constructed, are politically weak, enjoy little control, may be characterized as helpless and have policy directed at them in the form of inducements/sanctions and qualified capacity building.

The Dawes Act or General Allotment Act sought to break up the communal reservation into privately held Indian allotments, a policy intended to transform Indians into farmers (capacity building). This reinforced the message that they were a dependent target population needing assistance to assimilate into majority society. The termination policy, with a professed intent to assimilate tribal members and foster independence through a liquidation of tribal holdings, a cash payout to each tribal member, and an end to tribal recognition by the federal

government, may also be considered a policy directed at a dependent target population. Subsequent policies have reinforced this view, with the social construction of tribes being both negative and positive, reinforced by the federal government's notion that they served as caretaker for the tribes.

While much tribal policy has been designed with a message that Tribes are a dependent target population, the Tribes have demonstrated that social constructions are subject to change and population groups may move among the categories. Several policies, primarily legal decisions, have begun to realign the social construction with Tribes beginning to move from the dependent category to contender, more powerful but still negatively constructed in this context. Contenders are negatively constructed yet still wield power to soften the policy directed at them. They are skeptical of government and believe that they must look out for their self-interest (Schneider and Ingram 1993).

The *Winters v. United States* (1908) decision held that, upon establishment of reservations, the federal government also reserved enough water to fulfill the purposes of the reservation. This decision affirmed the tribes' senior water right for their reservation dating to the signing of the treaty in 1864. A series of decisions relating specifically to the Klamath Tribes, *United States v. Adair* (1983), determined that upon termination, the tribe did not terminate their non-consumptive water right to support their hunting, fishing and gathering rights with a priority date of time immemorial. These decisions, coupled with the restoration of tribal recognition by the federal government in 1986, secured a powerful position in natural resource management decisions, but under the social construction model as contenders they are often viewed with "suspicion rather than respect...They must be constantly vigilant to insure that government serves their ends" (Schneider and Ingram 1993:342).

The City of Chiloquin

The Chiloquin Community is one of the poorest municipalities in the state of Oregon, with nearly triple the poverty level of the Oregon state average (United States Census Bureau 2000). This economic condition combined with a general

attitude about Chiloquin in the rest of Klamath basin as explained by a community respondent (8), have situated the City on a trend from deviant to a dependent target population:

When I went into Klamath Falls and was asked where I lived and I said Chiloquin, people would step back [as if they were] kind of suspicious, kind of concerned. Chiloquin was a wild-west town in the heyday and that stereotype lingered on.

Conservation Groups

Conservation groups wield power through legislation and litigation, but are negatively constructed locally and therefore considered Contenders in this context.

Agencies

The social construction model does not typically assign constructions for agency scientists or elected officials, since they are designing and implementing policy, yet they have been identified as playing a significant role in this case and identified as substantial actors in water and natural resource policy in the Klamath Basin. In this framework, they will not be assigned a social construction. It is these local constructions that form the alignment in which to consider the application of the Endangered Species Act and the passage of the *Chiloquin Dam Fish Passage Feasibility Study*.

Endangered Species Act

The Endangered Species Act of 1973 (ESA) has a direct influence over Klamath Project operations as a federally funded or permitted activity under Section 7 of the Act. The ESA is a hallmark piece of environmental legislation that offers little latitude for the economic consequences of enforcement, excepting in the designation of critical habitat under Section 4. The federal agency responsibility to assess the impact of Klamath Project operations led to two 2001 jeopardy biological opinions—one for the shortnose and Lost River sucker, and the

other for Coho Salmon in the Klamath River. These jeopardy opinions included recovery actions, specific lake levels and downstream flows, which resulted in a shut-off of water to the Klamath Project. As noted in the preface to the National Academies of Science (NAS) report on the Klamath Basin in reference to the 2001 jeopardy biological opinions:

Remedies for the recovery of species often have harmful or at least frustrating effects on people and institutions. In such instances, the affected parties often are especially dissatisfied with the implementation of remedies that are not absolutely secure scientifically. But the ESA does not allow for delay, which would defeat its purpose. Thus, some of the remedies prescribed by agencies ultimately will prove ineffective and may cause economic and social disruption without any tangible benefit to listed species (Lewis 2004:xv).

Under the social construction model, an apparently advantaged group-the Klamath Project irrigators-was dealt a particularly burdensome policy application, which as the NAS report alludes led to significant economic and social consequences. The implementation of the ESA, an authority tool that also includes some sanctions (inducement tools), sent a policy message rather bluntly - the Klamath Project irrigators' activity was contributing to the extinction of the species. An MPID irrigator (3) called this, "A wake-up call. The ESA has overreaching powers. It is probably the most powerful act in agriculture." The jeopardy opinions sought to protect species, consequently prohibiting water to the project. Further, the Act's prohibition on the taking of the species (harm, harass or degradation of species habitat), are reinforced with the civil penalties under Section 11 sanctions.

Use of an authority tool, delivering a burden for an apparent advantaged population group, is not business per usual. Generally when a burden cannot be reframed by the advantaged as a benefit, Schneider and Ingram (1993:34) argue the policy is considered "unavoidable" and for the greater good. While species protection as the greater good may be disputed among the actors in this case

study, the environmental priority that the ESA places on species protection is quite clear, declaring that all federal agencies, “shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act” and shall in cooperation with state and local agencies “resolve water resource issues in concert with conservation of endangered species” (United States Fish and Wildlife Service 1973). This policy does burden an apparently advantaged group. The ESA application was to protect a species of cultural significance to the Klamath Tribes (a contender in this analysis). All the while the Tribes continued to be negatively socially constructed they maintained their influence after this event. The indirect benefits they may have enjoyed after 2001 were monies dedicated to habitat restoration on private lands, upwards of \$500 million (Walden 2007).

Schneider and Ingram (1993:343) write that at times, “Dramatic events will often serve as a catalyst for changes in social constructions,” further they suggest, “that the advantages enjoyed by the powerful...are occasionally pulled back.” A Klamath Project irrigator (20) suggested, “2001 wasn’t good for anyone...it raised a lot of questions about the ESA. A year later fish died...clearly something was wrong.” This readjustment threatened an apparently advantaged group not only economically and socially, but also their political power and positive social construction. The Klamath Project irrigators sought to reframe or recover their positive construction and get relief from the burden of this policy. While the authors consider disruptive forms of participation a low probability for advantaged groups, this is exactly one form of participation that the Klamath Project irrigators engaged. It is also argued that when policy proves burdensome to an advantaged group they may blame government and organize for policy change. Irrigation interests in the Klamath Basin organized the Bucket Brigade, a civic demonstration of 15,000 people in May of 2001 that sought to bring attention to the impact of the water shutoff to the irrigation community in the Klamath Basin (The Oregonian Staff and Wire Reports 2001). The aftermath of 2001 included a return of water to the project in the 2002 season, blunting the burden that had been imposed (sanction), funding for restoration projects

(capacity tools), establishment of a Bureau of Reclamation water bank which would purchase water from willing sellers to keep in stream (inducements), an inquiry by the National Academies of Science into the science on which the jeopardy opinions were built, and specific legislation to address fish passage at Chiloquin Dam (authority, learning, inducement).

Did the ESA application in 2001 lead to a reassignment of the social construction of Klamath Project Irrigators as Table 9 suggests? And was this a temporary assignment? The status of the project irrigators as being apparently advantaged was significantly challenged by this dramatic event. MPID could be held responsible through their dam violating the ESA's prohibition on the take of endangered species. At minimum, within the context of the ESA, both Modoc Point Irrigation District and Project Irrigators may be viewed as contenders, both engaged in activities that are publicly perceived (and legally realized) as negatively affecting the conditions of the species.

Table 9: Social Construction Chiloquin Dam-ESA Application

POWER Strong ↑ Weak ↓	POSITIVE <i>ADVANTAGED</i> Project Irrigators Modoc Point Irrigation District	NEGATIVE <i>CONTENDERS</i> Conservation Groups Klamath Tribes
	<i>DEPENDENT</i> Chiloquin Community	<i>DEVIANT</i>

Chiloquin Dam Fish Passage Feasibility Study

In the aftermath of the Klamath Project water shut-off, elected officials were looking for legislative solutions to the Klamath crisis. The National Academies of Science (NAS) report said that while agencies have been specifically focused on the Klamath Project's impact on listed species, the

conditions which impact the species go beyond the project, as should agency recovery efforts (Lewis 2004) including a specific recommendation to remove Chiloquin Dam. Emerging from 2001 was HR 2585, the *Chiloquin Dam Fish Passage Feasibility Study Act of 2001*, sponsored by Congressman Greg Walden (OR-R). The suggestions by respondents that dam removal was pre-determined would characterize the decision process as symbolic. MPID informants suggested, as did others, that dam removal was in the interests of the project irrigators providing them with an off-project recovery action. Klamath Project irrigators are not specifically cited in the legislation, but the suggestion that they are a key beneficiary of dam removal would substantiate their position as contender with benefits understated even as “symbolic” burdens are applied.

The benefits granted to MPID, a replacement of the Chiloquin Dam with irrigation pumps and a fund to operate them, are also capacity tools as subsidies but are also inducements to encourage them to come to agreement. The Tribes interest in making certain that dam removal was not viewed as an end to recovery efforts and commitments on habitat improvements above the dam are inducements which led a cooperative agreement among federal and state agencies to work towards improved habitat. Further, the federal agencies also bear tribal trust responsibility to aid in the management of tribal resources and as suggested in the environmental assessment document for Chiloquin Dam, “...managing fish passage over Chiloquin Dam appears to be one way of conserving and protecting the Klamath Tribes Indian trust assets” (Bureau of Indian Affairs 2005). Tribal trust responsibilities continue to frame the relationship with the tribes as one in which they are socially constructed as a dependent target population. Another framing may hold that the trust obligation is honoring the original contract signed, the treaty, between two sovereign nations. The trust responsibility, with recognized tribal priority on natural resources defines the contender construction.

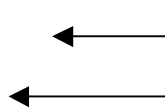
Schneider and Ingram (1993) argue that elected officials are motivated to produce legislation that aid in their reelection efforts and will be effective in addressing known public problems. The beneficiaries of HR 2585 arguably

include Klamath Project irrigators, MPID, conservation groups, the Klamath Tribes, Congressman Greg Walden, and the Bush Administration. Although it is important within the social construction model to suggest that Walden would be motivated by re-election, which he may have been, he is a five term incumbent who won with more than 70% of the vote in 2002 (Oregon Secretary of State 2002) and with two thirds of the vote in 2006 (Oregon Secretary of State 2006). Addressing a known problem (the condition of the sucker species), lessening the impact on an advantaged population with a solution (Chiloquin Dam removal) that had been suggested long ago by irrigators and others may be additional rationales for Walden's intervention.

Although it has been asserted that Klamath Project irrigators were motivated to get the endangered species de-listed, this was not an outcome of the legislation. The MPID irrigators enjoyed the benefits of a new irrigation system at no cost and the Klamath Tribes received assurances of monies available for upstream habitat improvement. So, while this proposal may have originated from Klamath Project irrigators, the benefits they enjoy are understated and may support the argument that they have not returned to a full advantaged position as suggested by Table 10. While Klamath Project irrigators may remain positively constructed there may be a reconstitution of political power. The events of 2001 and the collaborative efforts of the Chiloquin Dam decision-making may have signaled as one tribal respondent (11) suggested, "Changed political dynamics, (Irrigators) realized they could not use political muscle to prevent events from affecting them."

The social construction framework provides a model to analyze the impact, tools and messages through which policy interacts with the target populations. Designating particular constructions is an imperfect science and as Schneider and Ingram (1993) suggest, social construction are subject to debate and contention.

Table 10: Social Construction-Chiloquin Dam Fish Passage Study

POWER Strong ↑ Weak ↓	POSITIVE	NEGATIVE
	<i>ADVANTAGED</i> 	<i>CONTENDERS</i> Klamath Project irrigators Modoc Point Irrigation District Conservation Groups Klamath Tribes
	<i>DEPENDENT</i> Chiloquin Community	<i>DEVIANT</i>

Schneider and Ingram (1993) argue that an end goal of policy-making is to be reflective of democracy, a society in which political power is more equal and social construction becomes more positive. As an MPID Irrigator (1) commented, “Trying to dig the reasons for dam removal out? The dam removal is interconnected to so many things,” may suggest that whether the events of 2001 and the Chiloquin Dam collaborative process influenced a reconstitution of target populations is a question which may not be answered by examining only these two events, but require a further analysis of other collaborative efforts including the more recent Klamath Basin Restoration Agreement surrounding the Federal Energy Regulatory Commission’s re-licensing proceedings for dams on the Klamath River.

CONCLUSION

An aging dam infrastructure and the emergence of environmental values for species and environmental protection present conditions in which dam removal will increasingly be considered. In order to prepare for these choices, a better understanding of the social and scientific impacts of dam removal is necessary. The majority of dams that will face a removal decision in the near

future are small dams, and therefore small dam case studies are recommended. A shortcoming in dam removal knowledge is study of the human dimension.

In the case of the Chiloquin Dam removal decision, study participants perceived that the key social and policy factors that influenced the decision include:

- the Endangered Species Act;
- rising influence of the Klamath Tribes;
- uncertainty of science;
- political need to act; and
- alignment of dam removal expectations.

The Endangered Species Act (ESA), tribal trust, and tribal water rights were perceived as key policy factors with the Klamath Tribes, Klamath Project irrigators and dam owner Modoc Point Irrigation District as important policy players. The ESA was perceived as a chief motivating factor in dam removal, a policy that upon implementation challenged project operations and led to the water shut-off of 2001. Water rights adjudication and the tribal trust responsibility of the federal government have contributed to the Tribes increased influence in natural resource decision-making. This exploratory study suggests that scientific uncertainty regarding species recovery, a source of frustration to the irrigation community, may contribute to delay dam removal getting on the policy agenda.

Politics, perceived as influencing this decision by study respondents and driven by the need to respond to the crisis of 2001, was instrumental in the dam removal decision. Prior to 2001, there was not a political imperative to remove Chiloquin Dam and listing agencies pursued Section 7 enforcement of the ESA while not utilizing other sections of the ESA. Yet, during this time between species listing and dam removal decision, information improved, studies were released and the case was being built. The competing expectations of what dam removal would mean, delisting the species or part of larger recovery effort, may be a barrier to considering dam removal even if the dam removal action helps the goal in part, but it is perceived to undermine it overall if it is advanced as a stand-alone solution.

During 1988-2008, the social construction framework of the Klamath Basin was undergoing changes, whereby the nature of power and influence was beginning to be redistributed with the emergence of tribal water legal decisions and tribal restoration. The prism of social construction helps explain the dynamic nature of the construction of target populations as two major parties in this case, the Klamath Tribes and Project Irrigators, after 2001 can both be considered Contenders rather than Advantaged policy players. Irrigators worked to hold position and fend off negative construction with public demonstrations and political action. As contenders, one avenue out is to fight back to attempt to return to Advantaged or engage in collaboration. The Chiloquin Dam Fish Passage Study exemplifies the latter.

If measured alone by the purpose of the *Chiloquin Dam Fish Passage Feasibility Act*, this dam removal decision was a success. Despite perceptions of a politically pre-determined decision and a collaborative process that did not necessarily embody the trust suggested as requisite in much of the literature, an agreement was achieved which answered the concerns of the policy players and may contribute to the recovery of the sucker species.

Further study on the cumulative impact of the Chiloquin Dam Fish Passage Study, the recent Williamson River Delta restoration, and the Klamath Basin Restoration Agreement by diverse stakeholders in the Klamath Dams re-licensing case, may provide a broader understanding of social relationships changing through these activities. A community based survey, both before and after the dam removal, would be helpful in getting a better sense of the social impacts of dam removal. In addition, as there is a need to build a better scientific understanding, an examination of the collaboration within the scientific community may prove useful as a model of providing decision-makers as much scientific certainty as is available in small dam removals.

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