10

Columbia River Tribal Fisheries

Life History Stages of a Co-management Institution

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INTRODUCTION: COLUMBIA RIVER TRIBAL FISHERIES CO-MANAGEMENT

Co-management refers to "collaborative" or "cooperative" management that has been generally defined as the sharing of management power and responsibility between governments and local people (Berkes and Turner 2006:481; see also Berkes, George, and Preston 1991). Much of the literature suggests that fisheries agency managers should cooperate with local resource users in gathering data and decision-making to achieve more sustainable fisheries (Jentoft, McCay, and Wilson 1998; Loucks, Wilson and Ginter 2003). However, collaboration has various meanings (Berkes 1994, 2007), and equal power-sharing between co-managers is often not achieved (Nadasdy 2003). The Columbia River case discussed here provides an example of tribal fisheries co-management in the Pacific Northwest—generally recognized as one of the longest running examples of successful co-management (Cohen 1989; Dale 1989; Pinkerton 1989).

Historically, Columbia River tribes in Washington, Oregon, and Idaho managed fisheries through their own traditions and institutions. From the 1850s, however, Euro-American settlement displaced many Columbia River tribes from their traditional lands and fisheries, despite their resistance. After years of political organizing, two key court rulings—the 1969 Belloni Decision and the 1974 Boldt Decision—confirmed treaty fishing

rights for Columbia River and Puget Sound tribes. These court decisions initiated a significant tenure shift in Columbia River fisheries by defining a new co-management relationship between treaty tribes and state fisheries agencies. Yet despite these rulings, initial fisheries co-management institutions were heavily criticized, and many years of restructuring were required before Columbia River co-management became recognized as an effective governance mechanism. This history raises some questions. Has co-management indeed become a decision-making structure that facilitates more equal power-sharing between tribes and state agencies within Columbia River fisheries management? If so, how did the transformation from an ineffective to a more effective institution occur? And what are the implications for tribal fisheries today? In order to understand the conditions that have led to present-day co-management, this chapter evaluates the effectiveness of Columbia River co-management institutions at specific time periods by deploying Elinor Ostrom's (1990) principles of enduring common property institutions. For this case, I define effective co-management through the attributes of increased power-sharing and adaptive management, where institutions permit structured experimentation and management flexibility, thus allowing managers to incorporate future learning and changing conditions into their decision-making (Armitage, Berkes, and Doubleday 2007).

Through my case analysis, I argue that Columbia River treaty tribes played an integral part in creating co-management institutions through a collective choice process. I also show that co-management is not static, but is rather an evolving and nonlinear process, highly contingent upon shifting sociopolitical and ecological conditions. Finally, I argue that after forty years, Columbia River co-management has become more effective—containing particular institutional and noninstitutional properties—precisely because of tribal participation. One of the properties that I will discuss is internal legitimacy of co-management for tribes, along with the process of integrating Western science and Traditional Ecological Knowledge within intertribal management institutions today.

The scope of this analysis is primarily *U.S. v. Oregon* institutions involving treaty tribes, state and federal agencies, and intertribal co-management structures. The four treaty tribes signed treaties in 1855, reserving their rights to land and fisheries (Cohen 1989:38; CRITFC 1995; Slickpoo and Walker 1973). Together with the US federal government, these tribes filed lawsuits against Oregon over treaty-reserved fishing rights in federal court, which resulted in the decision *U.S. v. Oregon*, Civil No. 68–513 (D. Or. 1969). Emerging from this legal process, the primary Columbia River fisheries

co-managers are the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, the Confederated Tribes and Bands of the Yakama Indian Nation, and the Nez Perce Tribe (or Nimiipuus); the states of Oregon, Washington, and Idaho, represented by their respective Departments of Fish and Wildlife; and the US federal government, represented by the Departments of Commerce and the Interior.[1] My analysis focuses on the series of Columbia River Fisheries Management Plans (CRFMPs), adopted at approximately ten-year intervals, following this legal decision. When viewed alongside historical events, the CRFMPs provide useful signposts for understanding how *U.S. v. Oregon* co-management evolved. Personal interviews with Columbia River co-managers also inform the chapter.

LIFE HISTORY STAGES OF MANAGEMENT AND ENDURING INSTITUTIONS

Elinor Ostrom (1990:202) writes, "To understand institutional choice processes, one must view them as historical processes whereby current decisions are built on past decisions." Ostrom (1990:51) has defined institutions as the "sets of working rules" that determine decision-making processes. She has also analyzed institutions that have survived for at least one hundred years to determine a set of underlying design principles shared by long-enduring common property resource institutions. I have adapted these principles here as (1) clear boundaries and use rights, (2) rules that fit local conditions, (3) collective-choice governance, (4) monitoring, (5) graduated sanctions and enforcement, (6) conflict-resolution capacity, (7) recognition of community rights by external authorities, and (8) relationships to nested institutions (Ostrom 1990:90–102).

In addition, I use salmon life history stages, from the egg to adult (Groot and Margolis 1991), to help articulate the different stages of evolving Columbia River tribal co-management institutions and produce a "life history" of co-management for this case (figure 10.1). Following the tenure shift that initiated Columbia River co-management institutions, I break the institutional history into four parts: new institutions, refining rules, reorganization, and recognizing differences. The analogy—comparing development stages of salmon to institutional developments—is intended to help order the complex history of Columbia River management institutions and connect the policy back to a common goal: bringing back the salmon. The salmon life cycle analogy also reminds us that human fisheries management is codependent with the salmon itself. For example, salmon biology and genetics guide the migration behavior that brings salmon to North

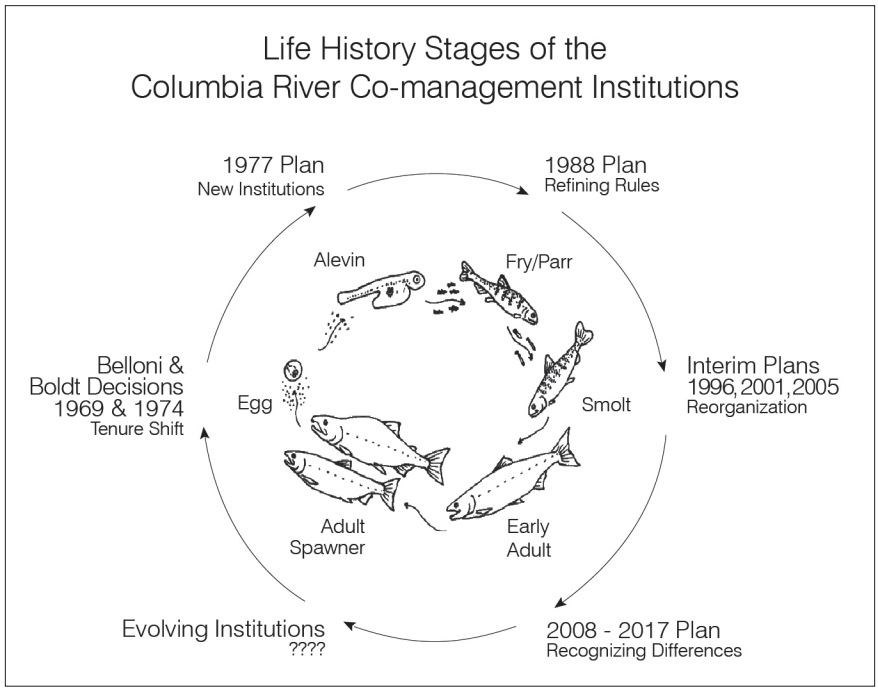

Figure 10.1

Analogy comparing salmon life history stages to the institutional history of Columbia River co-management. Source: Life cycle illustration provided by the Vancouver Aquarium. Additional graphic design by Nora Diver.

Pacific coasts and rivers—shaping where humans choose to live and work. At the same time, human management decisions about time, place, and manner of harvest affect salmon biology by determining what runs of fish reach their spawning grounds to reproduce.

(1) Tenure Shift/Egg Stage (Early 1970s)

> Salmon lay their eggs in the upper layers of stream gravels where the pores in the gravel allow oxygen to reach the eggs as they develop.

This section describes the point of origin for Columbia River treaty fisheries co-management in the early 1970s and the initial circumstances that led to new co-management institutions. Prior to Euro-American settlement, Columbia River tribes regulated access to fishing places within and among tribes (Aguilar 2005; Dupris, Hill, and Rodgers 2006; Hunn

and Selam 1990; Wilkinson 2007). Starting in the 1850s, however, Euro-American settlers increased competition for fisheries resources, created unregulated open-access fishery conditions, and often displaced tribes from traditional fishing places (Donaldson and Cramer 1971; Montgomery 2003). In addition, tribes fishing in-river were "last in line"—geographically disadvantaged relative to nontribal fishermen harvesting in the ocean or river mouth (Harrison 1986). Canneries introduced new processing technologies and capitalist markets, which made fishing "big business" (Cohen 1986:40). The state legislatures of Oregon and Washington responded by enacting fishing regulations in the 1870s and adopting the 1918 Columbia River Compact to establish uniform harvest codes in state boundary waters (Woods 2008). Still, salmon runs declined due to the combination of unregulated harvest pressure and habitat impacts (Lichatowich 1999; Taylor 1999).

Tribes responded to open-access fishing conditions by filing lawsuits, with direct protest actions, and by creating new institutions. In 1935 a new intertribal management institution was created at Celilo Falls, long an important place for intertribal gatherings (Boyd 2004). The Celilo Fish Committee was formed by representatives of the Mid-Columbia, Umatilla, Warm Springs, and Yakama Indians and was recognized by the commissioner of Indian affairs (Dupris, Hill, and Rodgers 2006). The committee enforced regulations that upheld sharing of traditional fishery resources, limited access to fishing places for outsiders, and also regulated the timing and location of Indian dip-net fishing at Celilo Falls (figure 10.2; Dupris, Hill, and Rodgers 2006:14).

The Celilo Fish Committee was a precursor to present-day intertribal co-management institutions. However, the Celilo Fish Committee's authority was primarily held at the local level. Despite its protests, the organization could not halt the federal government from constructing the Dalles Dam below Celilo Falls. The committee functioned until the dam gates closed in 1957, and the Columbia River rose to submerge the Celilo fishing rocks (Barber 2005).

Since 1887, Columbia River treaty tribes have worked to enforce treaty fishing rights through the courts (Cohen 1986:54). Lawsuits were based on the 1855 treaties, in which all four tribes reserved their exclusive right to fish on reservations and the right of taking fish "at all usual and accustomed places in common with the citizens of the Territory" (Treaty with the Yakima 1855:Article 3). In the early 1960s, treaty fishing rights disputes came to a head when state agencies attempted to regulate Indian fishing for conservation purposes. Game wardens harassed and arrested Indians

Figure 10.2

Dip-net fishing by Columbia River tribes at Celilo Falls, ca. 1950s, prior to its inundation by the Dalles Dam. Source: Oregon State Archives, Department of Transportation, highway photographs series, negative #G211.

fishing at off-reservation fishing grounds (AFSC 1970; Cohen 1986). At the same time, American Indian activists engaged in political organizing and direct action to raise public awareness and assert tribal claims to salmon harvests (Burns 1971). Numerous Indian fisheries activists organized "fish-ins" as a civil disobedience tactic (Shreve 2009; Wilkinson 2005).

Yakama Nation members Richard Sohappy and his uncle David staged the fish-in that produced the landmark 1969 court ruling on treaty fishing rights, *Sohappy v. Smith*, Civil No. 68–409 (D. Or. 1969). Later consolidated into *U.S. v. Oregon*, Civil No. 68–513 (D. Or. 1969), this became known as the Belloni Decision (AFSC 1970:201; Cohen 1986:120). *U.S. v. Oregon* initiated a fundamental tenure shift in Columbia River fisheries by upholding tribes' treaty rights to a "fair share" of the fish at usual and accustomed fishing areas, including off-reservation areas. Judge Belloni's ruling stipulated that state regulation of tribal fisheries could still occur in some cases, but only when necessary for conservation. Thus, states needed to take all

possible steps to preserve runs, including restricting the non-Indian harvest before restricting Indian fishing (Weaver 1997:680).[2] In the *Sohappy v. Smith* decree, the judge also ordered the states to provide tribes with the opportunity to "participate meaningfully" in rule-making that might restrict off-reservation fisheries.[3] A second landmark case followed. In *U.S. v. Washington*, 384 F. Supp. 312 (W.D. Wash. 1974), Judge Boldt interpreted the "fair share" entitlement to mean 50 percent of the harvestable fish destined for tribes' usual and accustomed fishing places. This established the 50/50 allocation principle: tribes and states could each take 50 percent of the harvestable fish entering the Columbia (Cohen 1986:12).[4] The Belloni court applied the Boldt Decision to *U.S. v. Oregon* the next year. Then in 1979, the US Supreme Court upheld the Boldt Decision principles in *Washington v. Washington State Commercial Passenger Fishing Vessel Ass'n*, 443 U.S. 658 (1979) (Woods 2005).

By the early 1970s, the culmination of tribes' political organizing and court rulings led to the recognition of treaty fishing rights, a major tenure shift. The *U.S. v. Oregon* and *U.S. v. Washington* court decisions established clear use rights for tribal fisheries co-management. Given the historical context, the persistence of tribal leaders and their allies that led to key court decisions was a remarkable endeavor. However, these "paper rights" needed to be implemented. Although court rulings laid the groundwork for co-management, a comprehensive management plan was not developed for several years. Thus, we can view this initial, emergent stage of Columbia River fisheries co-management as the "egg" stage.

(2) New Institutions/Alevin Stage (Late 1970s)

> When the eggs hatch, tiny fish called alevin remain attached to their yolk sacs and stay hidden in the gravels.

New fisheries co-management institutions were created in the 1970s; however, initial implementation was highly dependent on court interventions and limited in scope. The *U.S. v. Oregon* decision initiated Columbia River fisheries co-management as a set of legal institutions backed by the courts. The courts recognized treaty tribes and states as co-managers and convened all parties to jointly approve fisheries management regulations. In Washington State, changes were met with strong resistance from non-Indian fishermen and only sporadic state enforcement (Cohen 1986). But in Oregon, Judge Belloni took swift action to enforce his ruling and issued court injunctions to close sections of the Columbia River to non-Indian fishermen. The Department of the Interior also arranged for US

marshals to patrol the Columbia (Berg 2008). The states and treaty tribes initially operated under single-year management plans developed under *U.S. v. Oregon* jurisdiction. However, after almost eight years of continuous litigation and strong convincing from Judge Belloni, tribal, state, and federal co-managers jointly developed and signed the first five-year management plan, "A Plan for Managing Fisheries on Stocks Originating from the Columbia River to Its Tributaries above Bonneville Dam." In February 1977, Judge Belloni adopted this plan as a court order, maintaining federal district court jurisdiction over treaty fishing rights (Dale 1989; Weaver 1997).[5] After this plan expired in 1982, the federal judge presiding over *U.S. v. Oregon* ordered the parties to negotiate another plan (Smith 1998; Weaver 1997).

The purpose of the 1977 plan was to create a sharing agreement for the river that addressed harvest allocations and conservation issues. The stated goal was to "maintain, perpetuate, and enhance…fish stocks," as well as to provide treaty tribes and nontreaty users with "a fair share of the harvest" (CRFMP1977:1). The plan determined clear boundaries and use rights. It defined the shared resource as "stocks originating from the Columbia River and its tributaries above Bonneville Dam" (CRFMP 1977:1). It also confirmed the geographic limits for shared resources, previously established through the court as "fish caught in the Columbia River below McNary Dam and any other inland off-reservation catch placed in commercial channels" (CRFMP 1977:5). For the most part, this created a two-part fishery. Non-Indians could fish commercially from the mouth of the Columbia River to the Bonneville Dam (a 140 mi stretch, designated as Zones 1–5). Only treaty Indians could fish commercially above Bonneville to the McNary Dam (a 130 mi stretch, Zone 6, which included the now submerged Celilo Falls) (Cohen 1986).[6] We should note that tribal commercial fishing was included in the initial and subsequent agreements. From other chapters in this volume, we see that Indigenous peoples are often excluded from fisheries because tribal fishermen are banned from making commercial sales or using modern fishing gear—also a topic of dispute on the Columbia (see Sharakhmatova, chapter 5, and Carothers, chapter 7, as well as Colombi's discussion of *Washington v. Washington State Commercial Passenger Fishing Vessel Ass'n*, 443 U.S. 658 [1979], chapter 9, this volume).

The agreement also defined the percentage of catch harvestable by treaty Indian fishermen and non-Indian fishermen for each salmon run. For the fall chinook run, the plan allotted 60 percent of the harvestable fish to treaty fishermen—for ceremonial, subsistence, and commercial harvest—and 40 percent to nontreaty fishermen. For the spring chinook run,

the sharing formula was reversed with a 40/60 allocation, although tribes' ceremonial and subsistence harvests received first priority (CRFMP 1977). In summary, Indian fishermen received more fall fish, their principal run, and non-Indian fishermen received a greater share of the spring run of sport fish (Berg 2008).[7]

In addition, the plan established specific rules for harvest and conservation. The plan stipulated escapement goals, or the number of fish that must be allowed to pass through harvest areas unharmed for spawning. Allowable harvest levels were scaled proportionally to the size of fish returns. As an essential institution for collective choice governance, the Technical Advisory Committee (TAC) was created so that tribal, state, and federal representatives could suggest joint recommendations to the state and federal commissions setting fisheries harvest regulations (Cohen 1986).[8]

The Columbia River Inter-Tribal Fish Commission (CRITFC) was established in August 1977, shortly after the first five-year plan was adopted. Organized "in the manner of the Celilo Fish Committee," CRITFC was founded to serve the four Columbia River treaty tribes as a tribal technical and coordinating agency (CRITFC 1977). CRITFC hired its own policy, legal, and fisheries science experts and represented tribes in fisheries management policy arenas. Following the passage of the 1975 Indian Self-Determination and Education Assistance Act, CRITFC was able to receive recognition and funding through an agreement among tribes, the Bonneville Power Administration, and the Bureau of Indian Affairs (CRITFC 2003; Dompier 2005). A CRITFC (1987) report described the organization's purpose and limitations: "The tribes structured CRITFC to insure that policy is set by the four tribes through their fish and wildlife committees…CRITFC can take action only with the approval from each of the four fish and wildlife committees." Also, "CRITFC is accountable only to its member tribes, not to the states, BIA or any other entity." Along with negotiating with state agencies, CRITFC also facilitated allocations and enforcement among the four tribes, an important function not addressed through *U.S. v. Oregon* (Cohen 1986). In addition to CRITFC, individual tribes established their own fisheries programs to reflect their distinct values and management goals (see Colombi, chapter 9, this volume).

Lack of external authority, however, prevented intertribal fisheries institutions from effectively co-managing. For example, states did not fully recognize the legitimacy of tribal fisheries representatives. The 1977 plan set off a period of constant litigation, tying up fisheries management resources (Dale 1989; Harrison 1986). Also, the Technical Advisory Committee did

not give tribes a sufficient role in decision-making. For example, state biologists provided their own separate reports to the joint state agency that sets fishery regulations, and recommendations from tribal program biologists were given little consideration. Lack of tribal recognition and representation was also a problem with the Pacific Fisheries Management Council (PFMC), partly because representatives from state fisheries agencies had seats on the PFMC, while tribes did not (Cohen 1986:127).

Another problem was the lack of restrictions on ocean harvests. Although ocean fisheries intercepted salmon destined to spawn in the upper Columbia River, the management plan primarily addressed in-river fisheries (Weaver 1997). At this time, there was limited understanding of mixed-stock ocean fishery effects, and limited technologies were available for tracking fish migration patterns (Rich Lincoln, personal communication 2009). In January 1982, the Columbia River tribes' Council of Councils unanimously declared the five-year plan a failure. The Umatilla and the Yakama tribes formally notified the US District Court of their withdrawal from the plan (Cohen 1986:135). In September 1983, Judge Craig ordered further negotiation to develop a new management plan (CRITFC 1987).

In summary, the first five-year management plan defined fishery use rights and boundaries. In this early stage, we see mixed progress with negotiating in-river harvest allocations; however, rules did not address the broader scope of management issues. CRITFC emerged to represent the interests of tribal fishermen regarding shared intertribal fisheries. But the problem of ocean-based fisheries regulation was not adequately addressed, and conflict resolution mechanisms beyond litigation were lacking. Also, tribal management authority was still not widely recognized. The dependency of co-management institutions on court challenges and the partial function of co-management institutions recall the "alevin" stage of development, when young salmon are still attached to the yolk sac.

(3) Refining Rules/Fry or Parr Stage (1980s to Early 1990s)

> At this juvenile stage, the fry emerge from the gravels into the stream and begin feeding on stream insects. As the fry grow larger, they become parr and develop dark vertical markings that help conceal young fish from predators.

The 1980s and early 1990s were an important growth period for Columbia River co-management, during which co-managers built upon initial institutional structures. States and tribes spent ten years negotiating the 1988 Columbia River Fisheries Management Plan (CRFMP), a

ten-year plan, which vastly improved co-management effectiveness. A key factor was increased technical capacity for tribes, as well as for state agencies. A CRITFC Special Report (1987) stated, "Without their own technical experts, the tribes' victory in *U.S. v. Oregon* was almost meaningless." CRITFC provided the policy and science background to support the many successful lawsuits initiated by tribes (Sanders 2008). Norman Dale (1989:66) described how co-management processes also drove improved technical capacity for the state: "The Boldt and Belloni decisions forced the state fisheries agencies to search for state-of-the-art models and even to support development of new more advanced approaches to handling the dilemmas of many mixed stocks. In turn, tribal managers responded by bringing staff into the inter-tribal commissions who could understand and work with these new models." This description suggests a co-production process (Jasanoff 2004) in which co-management institutions and fisheries science essentially co-evolved. Through initial co-management institutions and the courts, tribes were empowered to push for new scientific models and fisheries-monitoring technologies. And when fisheries managers developed and adopted such new methods of doing fisheries science, this shift essentially changed the co-management institution, which could now require more meaningful decision-making and accountability regarding mixed-stock fisheries. As a case in point, tribes filed suit against the secretary of commerce prior to the 1988 plan (Cohen 1986), which helped drive some of the improvements in ocean fishery monitoring and regulation. As a result, the 1988 plan included a 50/50 fall chinook allocation that took into account ocean fisheries (CRFMP 1988:29).

One of the biggest changes in the co-management institution was more detailed rules of use that provided a better fit with local conditions. The scope of rules expanded to address hatchery management issues. Both tribes and state agencies supported hatcheries as a strategy for supporting salmon harvests in the highly developed Columbia Basin; however, the contentious issue of who received hatchery benefits needed to be addressed. First, the plan set out rules for where and how hatchery enhancement should occur. The location of initial hatchery facilities, all built below Zone 6 in locations outside of primary Indian commercial fishing areas, was of particular concern (CRITFC 2003). Second, the plan created a framework that defined sub-basin jurisdiction over harvest and hatchery management decisions by clarifying which individual parties were responsible for developing different sub-basin plans. The plan also adopted more specific rules for harvest allocation and rules to prevent harvest of more depressed stocks (CRFMP 1988). To establish relationships with nested

institutions, particularly higher level decision-making institutions, this management plan set a specific meeting schedule for co-managers to discuss yearly ocean and in-river harvest regulations with the PFMC and secretary of commerce (CRFMP 1988; CRITFC 2009).

This plan also introduced new institutional structures for collective decision-making and conflict resolution. A new Production Advisory Committee (PAC) and a Policy Committee were formed. A new conflict resolution procedure directed co-managers to initially address disputes within committees. Co-managers were directed to first review potential fishing regulations within the committee and then bring unresolved issues to the court's technical adviser for facilitated discussion (not arbitration). If the co-managers still did not reach consensus, the issue went to the Policy Committee. If the Policy Committee was unable to reach consensus, co-managers were required to document their position in a written statement to be distributed among parties (CRFMP 1988).

In the time leading up to the 1988 plan, tribal representatives increasingly engaged with higher-level, nested fishery management institutions beyond *U.S. v. Oregon* structures. Through the 1980s, tribes participated in international negotiations over ocean harvests of Columbia River–bound fish through the Pacific Salmon Commission, which was composed of four US and four Canadian commissioners. Holding one commission seat and one vote, tribes had a voice equal to the states (CRITFC 1987). In addition, President Reagan appointed CRITFC director S. Timothy Wapato to serve as chairman of the US section of the commission (CRITFC 1987). At the regional level, the 1980 Northwest Power Act marked congressional recognition of tribal salmon co-management in the Columbia Basin and supported tribal fisheries and restoration programs (Weaver 1997). Having established their own sanctioning and enforcement programs, tribes pledged to increase their police, prosecutorial, and judicial capacities (CRFMP 1988).

Thus, the 1988 ten-year plan built new rules onto existing institutions to address specific harvest and hatchery issues and to create improved conflict resolution structures. Passage of the Northwest Power Act helped co-managers address habitat restoration needs specific to the Columbia River context. In addition, tribes' authority expanded into higher-level nested institutions. Although litigation still occurred, improved conflict resolution meant co-managers could increasingly make time-sensitive decisions benefiting fisheries. These improvements in co-management may be compared to the "fry" and "parr" stages of development, when juvenile salmon become better able to fend for themselves in local streams.

(4) Reorganization/Smolt Stage (Mid-1990s to Early 2000s)

> During the smolt stage, the salmon's internal physiology changes from its freshwater form to its saltwater form, and the fish prepares to out-migrate to the ocean.

In the early 1990s, National Marine Fisheries Service (NMFS)initiated Endangered Species Act (ESA) listings for several Columbia River salmon runs originating in the Snake River, thus beginning a challenging period of renegotiation and reorganization for Columbia River co-management institutions. Instead of building on existing institutional arrangements, some fundamental tenants of initial co-management institutions were questioned during this period. Co-managers responded by adopting several three-year interim management agreements for 1996–1998, 2001–2003, and 2005–2007. The upset in co-management relationships occurred when the ESA triggered regulations legally requiring federal agencies, including Columbia hydropower agencies, to "conserve" threatened or endangered salmon runs (Weaver 1997). By changing jurisdictional authority and the allocation process, the ESA had the potential to substantially erode treaty fishing rights. Legal disputes targeted NMFS regulatory actions, which tribes viewed as a violation of the 50/50 allocation principle, the established CRFMP, and *U.S. v. Oregon* standards for reasonable and necessary conservation measures. Also, despite their initial hopes, tribes were disappointed that ESA listing did not prompt the federal government to consider dam-breaching (Weaver 1997). Interestingly, one state fisheries agency staffer commented that federal ESA listings unexpectedly led to a new "mutual interest" among tribes and the states in maintaining harvests on unlisted salmon runs (interview with author, June 30, 2009).

In a second shift, new ESA requirements forced a new level of vigilance around conservation measures for declining stocks. Fisheries management now had to address fishing from mixed stocks, or listed and unlisted runs that intermingle in the river. Federal regulatory processes limited harvest levels through Biological Opinions and incidental take permits for ESA-listed fish (CRITFC 1995). Incidental take permits complicated the 50/50 established use right. In addition, new hatchery production rules attempted to prevent genetic mixing of fish that originated in the hatchery and wild fish. Third, ESA provisions led to increased institutional complexity. Multiple institutions engaged in fisheries management, including Northwest Power Act committees, the Pacific Fisheries Management Council, the Pacific Salmon Treaty Commission, and the Department of the Interior. New multistakeholder processes, such as the NMFS Regional

Forum, were initiated (Smith 1998). Don Sampson (1996:682) described the effect as "nothing less than slow strangulation by paperwork and process." As co-managers negotiated deeper issues, they adopted interim plans that focused on immediate harvest and production actions and continued to follow the 1988 CRFMP procedures (CRFMP 1996–1998b).

In addition, tribes responded by publishing their own restoration plan, *Wy-Kan-Ush-Mi Wa-Kish-Wit (Spirit of the Salmon): The Columbia River Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs, and Yakama Tribes* (CRITFC 1995), which called for the implementation of fisheries management within existing institutional structures. The plan (1995:Legal Context) aimed to protect tribal sovereignty and tribal conservation interests, and it bluntly stated, "Rights are meaningless if there are no fish to be taken or resources to be managed." The restoration plan set out a salmon recovery agenda, aiming to "put fish back in the rivers and protect the watersheds where fish live" (1995:Executive Summary). Organized in two parts, the plan set out policy action recommendations and also presented sub-basin–by–sub-basin restoration and management goals for twenty major watersheds. The plan (1995:Cultural Context) emphasized the cultural context of salmon recovery: "Salmon are a part of our spiritual and cultural identity.… Without salmon returning to our rivers and streams, we would cease to be Indian people" (also see Colombi, chapter 9, this volume).

During the 1996–2007 period, ESA listing led to the renegotiation of Columbia River co-management. Co-managers adopted interim plans while they negotiated new rules to address ESA requirements. The new role of the federal government led to an alliance between tribes and the states, despite previous animosities. These transformational changes demonstrate that Columbia River co-management did not always evolve through gradual change. Rather, the institutions went through an abrupt reorganization in response to changing sociopolitical events, analogous to the abrupt transformational changes in juvenile salmon physiology that occur during the "smolt" stage.

(5) Recognizing Differences/Early Adult Stage (Early 2000s)

> As an adult in the highly productive ocean system, the salmon now switches to feeding on plankton and matures to its adult size.

By the late 2000s, Columbia River co-management had become a more mature institution, though it was still imperfect. After developing the necessary

capacity and legitimacy, these institutions had become a more effective forum where differing views on fisheries management could be heard. After the previous ten years of interim agreements and negotiations, *U.S. v. Oregon* parties arrived at the "2008–2017 *United States v. Oregon* Management Agreement." Although the 2008 agreement's goals were consistent with the 1988 plan, the new plan demonstrated a more sophisticated approach, allowing concurrent management of the treaty Indian fishery alongside the non-Indian fishery and recognizing differences between the two.

To address some of the conflicts that arose with ESA listings, the 2008 plan introduced the "catch balance model" to define harvest allocation in a mixed-stock fishery. This model attempted to balance the tension between the use right (the 50/50 allocation) and rules of use (ESA-driven harvest limits). The model recognized the different fishing methods practiced by Indian and non-Indian fishermen: nontribal fishermen practice "catch-and-release" or "selective" fishing, while tribal fisheries do not. In other words, nontribal fishermen keep marked hatchery fish and throw back wild fish, while tribal fishermen harvest all the fish in their nets. Hatchery fish are typically "marked" by the removal of the adipose fin (Dompier 2005). This difference in fishing practices reflects the belief of many tribal members that catch-and-release methods are disrespectful to salmon (CRITFC policy staffer, interview with author, June 29, 2009). Importantly, the 2008 agreement allowed tribal and nontribal fishermen to use the fishing method of their choice but attempted to incorporate the potential difference in total harvest numbers and wild fish mortality that could result from using selective versus nonselective methods.[9] Tribal and state fisheries managers reported controversy over implementing the catch balance model (CRITFC science staffer, interview with author, June 30, 2009; state fisheries agency staffers, interviews with author, July 1, 2009, April 20, 2010). Although non-Indian fisheries received a lower percentage of ESA incidental take, they were allowed a higher harvest rate on marked hatchery fish since unmarked wild fish would be thrown back (CRFMP 2008–2017:35–36).[10] Yet despite these differences, co-managers were still able to move forward with jointly developing the ten-year plan.

Hatchery reform was another significant issue in the 2008 plan that was negotiated but not resolved. Both the release location of hatchery fish and marking protocols affect tribal access to returning salmon. Some tribal members also view marking with fin clips as harmful to the salmon and therefore a culturally inappropriate practice. The 2008 rule changes included detailed, stock-specific hatchery production guidelines. For example, summer chinook production regulations stipulated release site, rearing

facility, origin of the stock, life stage of release, target numbers for release, and whether the hatchery fish would be marked. This agreement highlighted hatchery marking programs as an area of concern for tribes and prescribed a "basin by basin" approach to developing marking protocols (CRFMP 2008–2017).

The 2008 plan also included new approaches to monitoring, enforcement, and conflict resolution. First, co-managers agreed to use performance measures for harvest and production, with 1988–2007 stock performance as a baseline. Declines from the reference period would trigger an "analysis of causes," which might lead parties to adjust the management agreement or engage outside entities in problem-solving. Second, the agreement created a new Regulatory Coordination Committee to monitor regulations for consistency. Third, the parties agreed to monitor the performance of the upriver spring chinook catch balance model. Fourth, to improve graduated sanctions and enforcement, the tribes continued to emphasize the importance of increasing tribal enforcement capacity. Fifth, to promote conflict resolution, strategic work groups were created to assist the Policy Committee by reviewing technical information (CRFMP 2008–2017). Both CRITFC and state fisheries agency staffers have reported they are now relatively successful at conflict resolution within *U.S. v. Oregon* committees (interviews with author, June 30, 2009).

Although tribal authority stems from *U.S. v. Oregon* and associated court decisions, recent events highlight how tribal authorities have accessed nested institutions beyond *U.S. v. Oregon* structures. For example, treaty tribes helped negotiate the recently adopted US-Canada agreement that decreased ocean harvests of upper Columbia River spring and fall chinook (CRITFC 2009). In addition, CRITFC, Umatilla, Warm Springs, Yakama, and Colville tribes signed the 2008 Columbia Basin Fish Accords with the Bonneville Power Administration, US Army Corps of Engineers, and the Bureau of Reclamation. In the accords, Bonneville Power agreed to provide $900 million for salmon restoration actions, with significant funds for tribal watershed restoration projects. In return, the signatory treaty tribes agreed not to litigate on dam removal for a ten-year period. The Nez Perce, or Nimiipuu, chose not to enter the accords (CRITFC 2009), as is further discussed by Benedict Colombi, chapter 9, this volume.

Under the 2008 agreement, more sophisticated rules addressed tribal interests in harvests and hatcheries as well as ESA listings. The plan introduced additional performance monitoring. It also acknowledged differences in harvest methods between tribes and the states. Over time, the decision-making role of the four treaty tribes and CRITFC has increasingly

been recognized by external authorities and nested institutions. As with the adult stage of the salmon life cycle, this stage of Columbia River co-management has reached a certain level of maturity in which differences among co-managers are recognized.

(6) Evolving Institutions

I am tempted to bring the salmon life cycle metaphor to completion here with a narrative of salmon returning home to spawn, which reveals a key limitation of the life cycle metaphor. Although the salmon life cycle provides a useful communication tool that helps us to synthesize the complex history of Columbia River institutional developments, the metaphor is imperfect and certainly not predictive. Importantly, the life cycle metaphor suggests change and rejects a linear trajectory, yet identifying a metaphor that precludes a deterministic pattern of growth and progress is a challenge. Columbia River institutions will continue to evolve into the future, extending beyond a single life cycle, and the next round of changes in a highly context-dependent system is unlikely to replicate the first. Thus, we have reached the point of departure from the metaphor.

Still, the metaphor helps us to construct a mental model for recognizing and recalling patterns in the institutional changes that have occurred over forty years of Columbia River tribal fisheries co-management history. Based on this historical analysis, it seems clear that co-management institutions will continue to change and that the wild salmon, which is identified as a "cultural talisman" for the North Pacific region, as "our fish" (Smith 1979; White 1995:91), will remain important to tribal and nontribal people. Furthermore, tribes have demonstrated a long-term commitment to protecting salmon and the fisheries and will continue to drive the search for creative solutions to challenges facing Columbia River salmon and peoples, who are codependent on one another. Looking at the history of Columbia River co-management through Ostrom's framework of enduring common property institutions also helps us to learn from this case.

APPLYING OSTROM'S PRINCIPLES

In this chapter I ask, how did the ineffective initial stages of Columbia River co-management develop into a set of institutions that support increased power-sharing and adaptive management—the co-management of today? Applying Ostrom's (1990) framework to the Columbia River case further demonstrates that Columbia River co-management institutions are not static. Rather, the co-management institution is made up of a shifting set of rules that are being constantly negotiated and interpreted. Other

scholars have also viewed co-management as a long and continuous process (Berkes 2007; Pinkerton 1992). This stage-based approach, however, allows us to consider iterations of institutional design and the precise role of "incremental changes in existing rules" (Ostrom 1990:140). At the same time, Ostrom (1990:140) distinguishes such gradual change from the institution's moment of origin "as a major, one-step transformation."

Applying Ostrom's principles to the Columbia reveals that landmark legal decisions provided the transformational origin for Columbia River co-management institutions (early 1970s, egg stage). Then key changes were introduced, increasing co-management effectiveness in fits and starts, over time. First, management institutions required new conflict resolution mechanisms to define and enforce treaty rights—facilitated by the courts (late 1970s to 1980s, alevin and fry/parr stages). Second, institutions needed rules that fit the specific social and ecological conditions shaping Columbia salmon runs and harvests—equitable, timely, and adaptive structures for decision-making (1980s, fry/parr stage and onward). Finally, co-managers needed to gain access to nested institutions at the regional and international levels in order to impact decisions at the ecological and geopolitical scale of Columbia River salmon runs, which can migrate up to Alaska and the Bering Sea (1980s, fry/parr stage and onward). This history leads to the question of how much access do treaty tribes now have to the broad range of decision-making processes affecting Columbia River fish?

To this end I ask, does today's co-management facilitate equal power-sharing among co-managers? The answer depends on the type of decision-making or rule-making process.[11] At the level of day-to-day operational rules and collective choice rules, tribes appear to have a strong voice alongside state agencies through *U.S. v. Oregon* structures. Ironically, one tribal policy staffer expressed the concern that more limited funding for state fisheries agencies is hampering states' capacity to participate in co-management processes (interview with author, June 29, 2009). However, at the level of constitutional rules, which are important for higher level governance and legal frameworks, tribes are more likely to be in a consultative role, such as tribal delegations lobbying the US Congress. At the same time, Columbia River treaty tribes are participating in certain constitutional-level decisions, such as drafting international treaties.

Despite some backwards steps, the overall trend has been toward more equitable decision-making, especially given the 1970s as a reference point. Unlike the early stages of co-management, present-day structures address all elements of Ostrom's framework for enduring common property resource institutions, at least in part (table 10.1). Once tribes developed

Table 10.1
A stage-based comparison of Columbia River co-management evolution

Life cycle stage ►	A) Egg (early 1970s) Tenure Shift 1969 & 1974 Decisions	B) Alevin (late 1970s) New Institutions 1977 Plan	C) Fry/Parr (1980s to early 1990s) Redefining Rules 1988 Plan	D) Smolt (mid-1990s to mid-2000s) ESA Listings 1996, 2001, & 2005 Plans	E) Early Adult (late 2000s) Recognizing Differences 2008 Plan
Ostrom (1990) Framework ▼					
1) Clear boundaries and use rights	X	XX	XXX	X	XX
2) Rules that fit local conditions[a]		X	XX	X	XX
3) Collective-choice governance[b]		X	XXX	XX	XXX
4) Monitoring[c]		X	XX	XXX	XXX
5) Graduated sanctions and enforcement			X	XX	XX
6) Conflict resolution	X	XX	XXX	XX	XXX
7) Recognition of community rights by external authorities	X	X	XX	X	XX
8) Relationship to nested institutions		X	XX	XX	XXX

Qualitative scores summarize relative changes in fisheries co-management institutions, interpreted through Ostrom's (1990) framework as follows:

X = co-management institutions begin to address a given design principle at a minimal level.

XX = changes in co-management institutions allow additional, yet still partial, fulfillment of the design principle.

XXX = institutional changes now meet the primary tenants of the design principle. (For a supplemental appendix that further explains qualitative score choices, please contact the author.)

Definitions of Ostrom's principles include (a) congruence between local conditions and rules restricting multiple factors, including time, place, manner, or amount of fish harvests; (b) most individuals affected by the rules can participate in changing them; and (c) monitors are accountable to the resource user.
Source: Sibyl Diver.

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their capacity, they successfully represented their interests within newly created decision-making structures that they themselves took part in creating. Although tribes litigated constantly in the past, disputes today are typically handled out of court. Of particular note, tribes now participate in a range of nested institutions governing Columbia River fisheries at regional and international levels. As a result, treaty tribes have had a strong hand in shaping current fisheries science and policy, including ocean harvest monitoring and hatchery management standards. Davis Washines (interview with author, April 19, 2010), CRITFC's chief of law enforcement and Yakama Nation member, commented on *U.S. v. Oregon*: "It got us to the table as equals. Once it allowed that through the legal channels, then you

have this organization called CRITFC. All of a sudden they are trying to play catch up to us in a lot of areas."

Co-management has also increased the capacity for adaptive management in the Columbia River basin. In particular, co-management structures have precipitated an adaptive feedback loop in which learning among co-managers can better inform future fisheries management decisions. I also suggest that Columbia River co-management institutions and fisheries science were essentially co-produced, perhaps themselves a form of adaptive management. In Jasanoff's (2004) co-production framework, the making of an institution does not occur through a linear, unidirectional process. Rather, it results from an interplay between scientific knowledge and governance institutions so that scientific and political practices are simultaneously shaping one another. In the Columbia River case, having tribes involved in both knowledge-making and institution-making through the co-management process has led to some important lessons and improvements in fisheries management, namely improved ocean fisheries monitoring, hatchery reform, and successful watershed restorations.

For example, tribal involvement in fisheries management triggered a set of policies in the 1970s and 1980s including the Northwest Power Act, which, according to Kai Lee (1993:42), led to an increase in tribal shares of the harvest, even while total catch of Columbia River stocks decreased relative to previous years. Having treaty tribes at the table has increased the political will and funding to support fish passage and habitat conservation. And tribal restoration projects have brought salmon back to places like the Umatilla River (CTUIR n.d.). In addition, tribes have also encouraged hatchery development and reform. Although hatcheries can be a contentious topic, the Columbia Basin currently depends on a combination of production and conservation hatcheries to meet people's cultural and economic needs for salmon and to mitigate the negative impacts of dams. The question of whether we can bring back historic runs of Columbia River salmon depends on how we define our goals, political will, and many additional factors. In the 1995 restoration plan *Wy-Kan-Ush-Mi Wa-Kish-Wit*, tribes set the following goal: "Within 25 years, increase the total adult salmon returns of stocks originating above Bonneville Dam to 4 million annually and in a manner that sustains natural production to support tribal commercial as well as ceremonial and subsistence harvests" (CRITFC 1995:Executive Summary). An analysis of the tribes' plan for achieving this vision includes co-management but goes beyond the scope of the current chapter.

INSTITUTIONAL FACTORS ENCOURAGING EFFECTIVE CO-MANAGEMENT

This brings us to the final question: what were the factors or conditions that allowed this shift from initial institutional processes to more effective co-management to occur? Given the time-sensitive nature of the harvest and lengthy nature of legal disputes, parties required *additional conflict resolution mechanisms* beyond the courts. Although the external authority of federal district courts was necessary, litigation was insufficient for establishing effective co-management. One lawyer working for the tribes explained, "So one of the reasons why it works, is, I'll be frank, is because there's a federal judge sitting over there. That if there's a problem with how people are getting on, he's the backstop." But she continued, "And every season, the tribes would go back to court. They would go back to court, and the court would say,…'States, you screwed up.' But by that time…you know, the fish come in, they're there, and they go to spawn" (CRITFC policy staffer, interview with author, June 29, 2009). Additional conflict resolution capacity provided by the *U.S. vs. Oregon* committees has been essential.

For effective co-management, institutions also needed to *address the tension between treaty rights and conservation rules.* Historically, conservation rules have been used as a pretext for preventing Columbia River tribes from catching their fair share of the fish. Because Indian fishermen were located upstream from most non-Indian commercial fishermen—"last in line" and "in plain sight"—late season fishery closures occurred only after non-Indians had caught their share. Thus, tribes often bore the burden of conservation regulations. Given the greater visibility of in-river Indian fishers compared to non-Indians fishing offshore, as well as issues of racial discrimination, tribes often became scapegoats for declining runs, despite the reality of tribes catching smaller amounts relative to non-Indian fishermen (Cohen 1986; Montgomery 2003). Yet there have been times when declining stocks have warranted fisheries closures. This tension was recognized in the initial Belloni Decision and its appeals, which placed limits on the rights of states to regulate tribes for conservation purposes (Gartland 1977), and it continues to be present in the Columbia River today with ocean harvest limits, hatchery placement, ESA listings, and catch balance models. A similar tension exists for other Indigenous communities, such as the Afognak Sugpiat example discussed by Courtney Carothers, chapter 7, this volume.

Another condition for effective co-management was *increased organizational capacity for tribes,* which helped establish the legitimacy of tribes

as co-managers. Not for many years after the Belloni and Boldt decisions were treaty tribes broadly recognized as fisheries management authorities. Treaty tribes gained this recognition by building institutional capacity and leadership through CRITFC and individual tribal fisheries departments. They waged a series of court battles to uphold treaty fishing rights. Tribes also asserted their authority through the day-to-day practice of negotiating with state managers through *U.S. v. Oregon* structures. Building legitimacy for tribal co-managers has required extensive funding from multiple sources, including federal and state governments, hydroelectric companies, and private grants (CRITFC policy staffer, interview with author, June 29, 2009). Funding from the Bonneville Power Administration, supported by hydropower ratepayers, has been critical for the development of co-management capacity. CRITFC (1995) suggests that this cost is bearable and worthwhile if it is shared among the wide range of citizens in the basin who benefit from the resource. Yet funding salmon recovery through hydropower-producing dams that often block the passage of fish highlights the tricky business of working with established industry, an issue that has also arisen on Sakhalin with oil companies (Wilson, chapter 2, this volume).

FACTORS BEYOND THE INSTITUTIONAL LENS: TRADITIONAL ECOLOGICAL KNOWLEDGE, SCIENCE, AND SOCIAL NORMS

Going beyond institutional frameworks reveals additional factors essential for effective co-management. Researchers have found that effective co-management is highly dependent on local community attributes, particularly leadership and social capital (Gutiérrez, Hilborn, and Defeo 2011; Pinkerton and John 2008). In this same vein, I found that an additional condition for effective Columbia River co-management was *building internal legitimacy in practice*. A common critique of co-management with tribes is that institutions are typically based on dominant society's structures and values (Deloria and Lytle 1984; Weir 2009). Thus, some co-management may increase the marginalization of Indigenous peoples (Nadasdy 2003). This fact raises an important question for Columbia River co-management: to what extent have the treaty tribes been able to shape governance structures and practice tribal fisheries management based on current community values? In other words, does the practice of co-management have internal legitimacy for Columbia River treaty tribes? The answer may differ among and within tribes. But to address one aspect of the question at the intertribal level, we may ask how does Traditional Ecological Knowledge (TEK) interact with Western scientific knowledge at CRITFC?[12] In the

literature, TEK has been defined as "a cumulative body of knowledge and beliefs handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment" (Berkes, Colding, and Folke 2000:1252).

At first glance, TEK appears to be absent from Columbia River co-management. For example, the fisheries management plans (CRFMPs) contain no language addressing traditional or Indigenous knowledge, and the CRFMPs only mention *Wy-Kan-Ush-Mi Wa-Kish-Wit* once in passing (CRFMP 1996–1998b:12). Granted, *U.S. v. Oregon* structures for collective governance were initially established through the courts and primarily based on scientific management principles. In order to engage on equal footing with states, CRITFC and individual tribes have prioritized building strong fisheries science programs. CRITFC, however, sees itself as an organization that integrates conventional Western science and TEK. In interviews, CRITFC staffers reported that TEK shapes the organization's policy. One policy staffer described efforts to integrate TEK and science: "Here at our commission…we don't have a tribal longhouse department.… We are very much science, law, and co-management program functions." Yet, TEK still guides decision-making, he explained. "Our tribal commissioners, those identified by the tribal governments as their representatives, guiding our commission, are expected to have an awareness and ability to fuse the tribal reconciliation of culture and governance into an intertribal program" (interview with author, June 29, 2009). Because of the people who come together through CRITFC—scientists, tribal leaders, and combinations of the two—both science and TEK inform CRITFC decisions and co-management policy.

Despite its relative absence from the management plans, there are numerous examples of TEK shaping current intertribal fisheries co-management at CRITFC.[13] One example is management practices that ensure fishing can occur at family-owned fishing places. A scientist working for CRITFC explained that this sometimes means putting social criteria ahead of economics. "If you want to maximize the efficiency of your fishery, you basically want to get as many fish out of the water as soon as you can, as far downstream as you can," he said. Yet, the tribes do not manage this way. "We have to figure out how to do fisheries so that we've got a reasonable balance of opportunity to catch some fish in different areas" in order to serve tribal members, he explained (interview with author, June 30, 2009).

A second example involves incorporating tribal worldviews into fisheries management policy, particularly tribes' cultural and spiritual relationships to salmon. One tribal policy manager explained, "If you are catching

a fish…it is due to the Creator's benevolence. It is not the man's, human's role or authority to say, 'Oh no, Mr. Fish, you fought to the near death. Now you are to be placed back in the water.'" Respect for the fish is important, and recreational fishing is typically looked down upon as "playing with the fish" (interview with author, June 29, 2009). This relationship leads tribal fishermen to harvest all the salmon from their nets, including wild and hatchery-origin fish, a practice that is accounted for with catch balance rules, as I have discussed.

A third example of how TEK guides current fisheries management is related to subsistence and ceremonial fishing, which has a specific allocation and is managed separately from the commercial fishery. The importance of providing salmon for spring ceremonies is held above other fishing priorities, and co-managers have written explicit contingencies into CRFMPs for providing ceremonial fish to tribes, even when spring salmon runs are low.

A fourth example is selected tribal hatcheries, which incorporate both the latest hatchery technologies and "thinking like a salmon" into their designs (see Colombi, chapter 9, this volume.) The Nez Perce or Nimiipuu have built a tribal hatchery near Cherry Lane, Idaho, whose ponds are free from hard, straight lines; incorporate high-velocity flow, sunken logs, and other structures that mimic natural habitat; and include subsurface feeding systems that encourage fish to learn predator avoidance, along with other innovations not used in conventional hatcheries (FiveCrows 2003; Bonneville Power Administration et al. 1997).

Finally, tribes are often using conventional Western science in the service of a deeply important cultural practice—caring for the salmon—thus complicating the division between Western science and TEK.

While acknowledging that today's co-management structures are undeniably shaped by state institutions and Western science, we can see many instances where TEK interacts with scientific management. I would suggest this is an example of tribes producing a new Indigenous knowledge system. This knowledge system includes a strong science program, incorporates TEK through tribal representatives, and requires consensus-based decision-making, among other attributes. Viewing CRITFC's ongoing process of integrating TEK with science as a new and evolving knowledge system highlights how tribal cultures are both flexible and dynamic. This approach brings together old and new ways, reflects tribes' particular ways of knowing salmon, and recalls the principles of adaptive management and learning.

Another condition that goes beyond Ostrom's (1990) framework is *shifting social norms*. Ostrom (1990:35) discusses shared norms as incentives for upholding agreements even when breaking the rules results in no

immediate consequences. Yet, shared norms are insufficient for creating an enduring resource management institution; otherwise, institutionalized rule systems would not be needed (Ostrom 1990:93–94). This limited treatment unfortunately does not reflect the importance of shifting social norms that drive the evolution of effective co-management. Despite having combative co-management interactions in the past, some co-managers report that shared norms among co-managers have changed, making negotiations easier: "There's been occasion when it's felt a little bit like the old Warner Brothers cartoons. This was in the Bugs Bunny series, where you've got the sheep dog and the coyote and they go to work every day. And so at the beginning of the cartoon, they're going to work with their lunchboxes, and they check in a little time clock at the tree or something. And then they do battle with each other. And then at the end of the cartoon, the day is done, and they clock out, and they're talking to each other on the way home" (CRITFC science staffer, interview with author, June 30, 2009).

This statement is not intended to suggest that disputes no longer occur, but it suggests how social norms guiding interactions among co-managers have shifted. Some authors have ascribed this change to "social learning" (Dale 1989; Lee 1993), and multiple staffers at CRITFC and state fisheries agencies referred to building "trust" among co-managers (interviews with author, June 29, 2009, June 30, 2009; Rich Lincoln, personal communication 2009). However, these interpretations focus on individual co-managers and personal intent. In reality, this change in attitude has been shaped within a broader social context. As an area of future study, this pattern of shifting norms could perhaps be better explained through Michel Foucault's (1990:92) analytic of power as a "multiplicity of force relations." This approach could help identify key areas of shifting power relations for Columbia River fisheries, shaped by salmon declines, hydropower development, and changing perceptions about American Indians.

CONCLUSION: GETTING TO CO-MANAGEMENT

In conclusion, I suggest that Columbia River fisheries co-management has produced a set of institutional structures that harness the tension among co-management partners and drive improved decision-making and innovation. However, getting to co-management first required that institutions were established and legitimized. Columbia River treaty tribes then worked within the conditions of the time to help produce the necessary political space and mechanisms for tribes and state agencies to interact on a more equal playing field. As fisheries science and co-management institutions co-evolved, more effective fisheries management rules could then

emerge. Thus, I suggest that important changes in fisheries management occurred not in spite of but rather because of the differences in perspective among co-managers, which became visible through co-management processes. One fisheries scientist at CRITFC put it this way: "And whereas, if without the co-management tension there, there would be a lot more pressure to deal with short-term economic issues that would make it seem like salmon recovery is just a little too expensive, and these fish really aren't worth it. So I think by having a lot of people working, representing different constituencies, haranguing each other, saying, 'No, no this stuff is important. We gotta keep working on this,' I think, actually, it works well" (interview with author, June 30, 2009).

At one level, this idea supports Kai Lee's view that the "gyroscope" of democratic political processes has helped to improve Columbia River salmon management. However, in recalling co-management history, we see that treaty tribes were included in fisheries management only after a key legal decision clearly recognized and defined treaty fishing rights—a decision opposed by many dominant political interests at the time. Representative democracy was insufficient to address treaty fishing rights, but when the judiciary intervened through *U.S. v. Oregon*, thus producing a new institutional framework based on collective choice decision-making, the work of building an effective institution could begin. Over forty years, co-managers negotiated to establish a co-management institution that, at some level, supports more equal power-sharing and facilitates adaptive management.

In considering what this case means for other Indigenous communities struggling to have a voice in salmon fisheries management (see Kasten, chapter 4, and Sharakhmatova, chapter 5, this volume), we must acknowledge that Columbia River co-management has been a struggle. One CRITFC policy staffer commented, "There is an enormous weight of maintenance around co-management that many people have shouldered for an awful lot of days" (interview with author, June 30, 2009). In this struggle, we should not underestimate the importance of the transformational origin of Columbia River management with the Boldt and Belloni decisions, tribal leadership and commitment to building legitimacy for Columbia River co-management, and key conditions that allowed the institutions to become more effective over time.

Although each place has its unique sociopolitical and ecological context, and its own history of institutional changes, we see the beginning of similar struggles for Russian Indigenous peoples. In Victoria Sharakhmatova's chapter (this volume), she critiques the Russian legal system for failing to

enforce even the subsistence fishing rights that are guaranteed Russian Indigenous peoples by law. In response, we see Russian Indigenous leaders taking steps to build capacity and engage with the Russian legal system on fisheries management policy. For example, national organizations like the Association of Indigenous Peoples of the North, Siberia, and Far East of the Russian Federation (RAIPON) are building external legitimacy for their cause through the United Nations and through Russian national bodies such as the Public Forum. Russian Indigenous community-based organizations have filed lawsuits and engaged with regional governments to allege violations of Indigenous fishing rights and discuss policy solutions. Allocating fishery resources to Indigenous people becomes extremely difficult, however, when those resources are highly valued on the global market. New legal mechanisms may play a role in addressing this challenge. But where is the opportunity to transform institutions and encourage the enforcement of Indigenous fishing rights in a place like Kamchatka, given the Russian context? Ostrom's theory and the Columbia River experience have demonstrated that fisheries management can be more effective when tribal representatives with a strong interest in maintaining fisheries for the long term participate meaningfully in forming governance institutions. So even as offshore oil development is being considered by keystone salmon nations of Sakhalin, Kamchatka, and the Aleutians, how do we ensure that our governments on both sides of the Pacific make room for Indigenous voices that are advocating both for a fair share and for the protection of vital salmon resources?

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Notes

1. Columbia River tribal fisheries co-management involves additional groups, including the Shoshone-Bannock Tribe of Idaho and nontreaty tribes, which participate in specific co-management processes. Although nontreaty tribes along the Columbia

River generally have less influence than treaty tribes in fisheries management decisions, their role in Columbia River fisheries is a research topic in its own right. Beyond the intertribal institutions discussed in this chapter, we should also note that individual tribes have separate relationships with relevant states, and tribes have additional management rights and responsibilities over usual and accustomed fishing areas within their individually ceded territories and Columbia River sub-basins.

2. In the context of Columbia River fisheries policy, the terms *Indian harvest* versus *non-Indian harvest,* or *tribal fisheries* versus *nontribal fisheries*, are often used to distinguish the 50/50 harvest allocation between the two groups.

3. Noted in *Sohappy v. Oregon*, 302 F. Supp. 899, 912 (D. Ore. 1969).

4. The category "harvestable fish" excluded fish caught by Indians on reservations, fish caught by Indians for ceremonial or subsistence purposes, and the "escapement" set by fisheries managers, meaning the number of fish that must be allowed to pass through fishing areas and return to their home rivers to spawn (Cohen 1986:12).

5. The co-management plans for Columbia River tribal fisheries are court filings, developed by co-managers and issued as judicial orders under *U.S. v. Oregon*, Civil No. 68–513 (D. Or. 1969). Recent agreements can be accessed online or through www.pacer.gov/. Older plans or agreements may be accessed through the District Court or attorneys working with *U.S. v. Oregon*. This chapter uses the abbreviation CRFMP (Columbia River Fisheries Management Plan) to refer to the various plans. The full names of the plans are (1) A Plan for Managing Fisheries on Stocks Originating from the Columbia River and its Tributaries above Bonneville Dam, February 28, 1977; (2) 1988 Columbia River Fish Management Plan; (3) 1996–1998 Management Agreement for Upper Columbia River Spring Chinook, Summer Chinook and Sockeye; (4) 1996–1998 Management Agreement for Upper Columbia River Fall Chinook; (5) 2001–2003 Interim Management Agreement for Upriver Spring Chinook, Summer Chinook, and Sockeye; (6) 2005–2007 Interim Management Agreement for Upriver Chinook, Sockeye, Steelhead, Coho and White Sturgeon; (7) 2008–2017 United States v. Oregon Management Agreement, May 2008, and they are available at www.critfc.org/text/press/20080813.html.

6. Importantly, Zone 6 does not cover all "usual and accustomed fishing areas" for treaty tribes. Individual tribes have additional fishing rights within their ceded territories and reservations. Intertribal fishing areas also include in-lieu fishing sites that extend beyond Zone 6. In 1939 Columbia River treaty tribes and the United States reached a settlement agreement in which the United States promised to acquire alternative fisheries sites for tribes in lieu of those inundated by construction of Bonneville Dam. Only five "in-lieu" sites were initially acquired. In the 1980s, tribes pushed for additional sites, which were established by law in November 1988 (www.critfc.org; Ulrich 2007).

7. There are different types of nontribal fishermen, including sport fishers, gillnetters (commercial fishermen), and ocean trollers (commercial fishermen and also charter services for sport fishers). All these groups have different fishing practices and interests and are primarily regulated by state agencies. However, sport fishers currently have the greatest political influence on state regulatory bodies (White 1995:98).

8. Although co-managers provide data and recommendations, the Columbia River Compact and Pacific Fisheries Management Council are the legally designated bodies that set fisheries harvest regulations (Cohen 1986).

9. "Selective fishing methods" refers to non-Indian release of wild fish and retention of hatchery fish, while "nonselective fishing" refers to Indian retention of both wild and hatchery fish (state fisheries agency staffer, interview with author, July 1, 2009).

10. One state fisheries manager reported that a higher harvest rate on mixed stocks is possible because wild fish that are released from nets do not fully count toward the total harvest number. Rather, harvest estimates incorporate the expected mortality of released fish. A state agency staffer explained, "We say that the number of hatchery fish we keep and the number of wild fish that die after they are caught and released, i.e., the incidental catch, are equal to the total harvest" (interview with author, July 1, 2009).

11. Ostrom (1990) distinguishes three hierarchical levels of rule-making processes. *Operational rules* affect day-to-day decisions, such as appropriation, provisioning, monitoring, and enforcement. *Collective choice rules* are used in policy-making by appropriators, their officials, or external authorities. *Constitutional rules* affect who is eligible to craft the rules governing both operational and collective choice rule-making, and they impact higher-level rule formulation, governance, adjudication, and modification in constitutional-level decisions.

12. Additional research is needed to assess the internal legitimacy of co-management among and within the four treaty tribes as distinct nations.

13. Understandings of TEK can vary widely among different tribes and individuals. Although the intertribal forum at CRITFC does allow TEK to guide policy, additional research is needed to reflect on how TEK is understood and practiced by each individual treaty tribe.