

We Are the Stewards

Indigenous-Led Fisheries Innovation in North America



— by Ian W. Record

Native Nations Institute
for Leadership,
Management, and Policy

The Harvard Project
on American Indian
Economic Development

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A closely related piece by Ian Record on tribal fisheries will appear in the forthcoming book, *The Global Sea Food Industry: Advancing Through Innovation* (Oxford: Blackwell), due out in 2009.

Photography Credits

Cover, from top: 1. Tulalip Tribal Fisheries technicians pulling in a beach seine as part of an estuary inventory in the lower Snohomish River. Photo courtesy of Northwest Indian Fisheries Commission archives. 2. A female Red Lake walleye captured in the tribal spawn trap during a routine spring assessment. Photo by Joe Rossi. 3. Red Lake Department of Natural Resources Fisheries crew sorting walleye captured during spring walleye assessment at the Blackduck River on the Red Lake Indian Reservation. Photo by Joe Rossi.

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Abstract

This paper offers an overview of the current state of Indigenous-led fisheries management in the United States and Canada. It summarizes major trends in Indigenous-led fisheries innovation in North America and presents common keys and challenges to the success of these efforts. It chronicles three cases that demonstrate the ingenuity, resourcefulness, and tenacity of Native nations in exerting substantive management authority over the fisheries on which they have long depended. While re-establishing and protecting Native nations' rights to manage fisheries is critical, the question of what Native nations do with those rights, once regained, is also important. This paper suggests that internal institutional factors often play a critical role in Native nations' efforts to develop, implement, and monitor innovations that advance their vision for sustainable fisheries. Finally, it provides other Indigenous peoples (in North America, New Zealand, Australia, and elsewhere) food for thought as they work to increase decision-making authority over fisheries, develop and sustain fish resources, and ensure the economic, physical, and cultural benefits of those resources.

Table of Contents

Introduction	1
Challenges	4
Trends	9
Case Studies	15
Yukon River Inter-Tribal Watershed Council.....	15
Red Lake Walleye Recovery Project	26
Tulalip Tribes and the Snohomish Basin BioGas Project	35
Lessons	43
Policy Recommendations.....	52
Conclusion	55
Acronyms	56
Bibliography	57
Appendix A	62

*We are the stewards. That was ingrained
in us generations and generations ago.*

- W. Ron Allen, Chairman,
Jamestown S'Klallam Tribe*

* Panel discussion, Mid-Year Conference, Affiliated Tribes of Northwest Indians, Tacoma, WA, May 17, 2005.

Introduction

For many Indigenous peoples throughout North America, no single natural resource has been more culturally vital than fish. As reflected in their cosmologies, oral traditions, histories, and ceremonies, and explicitly affirmed in the treaties they forged, the physical, social, spiritual, and economic sustenance that fish provide has framed all aspects of communal life and experience.

Through close stewardship and spiritual connection, these peoples throughout their histories continually adapted their management of fish resources and ecosystems in an effort to maximize yield and benefit while simultaneously ensuring sustainability.¹ When disease, drought, floods, other natural disasters, or excessive consumption imperiled the health of fish resources, they were able to draw upon storehouses of local ecological knowledge to modify management strategies and work for species survival. For example, during times of scarcity, groups sharing common fish resources banded together to protect the resources. During times of plenty they relied on fish resources not only for subsistence but also as an economic engine, trading with one another to support their families and communities. Always, they offered worship to ensure the health of their waters and an abundance of fish.

European colonization of North America disrupted this time-honored, reciprocal relationship between Indigenous peoples and their fish resources. Rampant overharvesting, damming, large-scale logging and ranching, new types of agriculture, unchecked development, and the widespread destruction of critical habitat placed burdens on fish species, pushing many to or near extinction. The reservation system compounded the destruction, as Indigenous peoples often could no longer access fish resources in accustomed places or employ strategies designed to protect them. Over time, these pressures—along with federal programs designed to assimilate tribes in the United States and

1. Black, *Redefining Success*, 17.

First Nations in Canada into dominant society—eroded the capacity of many Indigenous peoples to sustainably manage fisheries.

In North America, as elsewhere, colonialism has complicated Indigenous nations' jurisdiction over fisheries management. In the United States, Native nations may exercise significant authority over fisheries located on their reserved lands; many have used this authority in innovative ways, trailblazing new ground for fisheries management that has both on- and off-reservation effects. Additionally, numerous landmark court cases—notably *U.S. v. Oregon*, the *Boldt* decision (*U.S. v. Washington*), and the *Passenger Fishing Vessel* ruling—affirmed treaty-reserved fishing rights and advanced the exercise of co-management authority by Native nations over off-reservation fisheries, particularly in the Pacific Northwest and Upper Midwest.² In Canada, First Nations have had limited say over fisheries and fish resources. The 1990 *Sparrow* decision accorded First Nations priority rights for subsistence and ceremonial purposes and mandated their participation in fisheries management. But, to date, the Canadian government has been slow to cede management authority.³

Since the 1960s, Native nations have aggressively pushed to regain substantive decision-making capacity. Today, a growing number are major management players in some of the continent's largest, most vital watersheds.⁴ Moreover, this authority has opened the door to

2. *U.S. v. Oregon*, 302 F. Supp. 899; 1969 U.S. Dist. LEXIS 9899; *U.S. v. Washington*, 384 F. Supp. 312; 1974 U.S. Dist. LEXIS 12291; *Washington v. Wash. State Commercial Passenger Fishing Vessel Ass'n*, 443 U.S. 658, 666-67 (1979). Many Native nations explicitly reserved through treaties the rights to fish in the often expansive areas they were ceding. Coastal Salish tribes, for example, secured their right to take fish in “usual and accustomed” places located off of the reservation in the numerous treaties they negotiated with Washington Governor Isaac Stevens in the 1850s. It should be noted that *U.S. v. Oregon*, *U.S. v. Washington* and other seminal cases were brought by the United States against states to enforce the rights Native nations purposefully reserved through treaties. Despite these momentous court decisions, Native nations in the United States lack direct legal authority to manage much of the territory necessary to sustain their fisheries.

3. *R v. Sparrow* 1 S.C.R. 1075 (1990). For a discussion of First Nations' struggle to gain management authority in eastern Canada, for example, see Atlanta Policy Congress of First Nation Chiefs, *Post-Marshall Implementation*. There are a growing number of exceptions to this norm.

4. Cronin and Ostergren, “Tribal Watershed Management,” 88-89.



Carrying the salmon from the water on a cedar-bough-covered litter at the Tualip Tribes First Salmon Ceremony, about 1987. Courtesy of NWIFC.

Indigenous-led fisheries innovation.⁵ From the Penobscot Indian Nation's multi-partner effort to rehabilitate the Penobscot River in Maine for sea-run fish, to the Nisga'a Nation's deployment of its ecologically and scientifically sensible fish-wheel technology for harvesting in British Columbia, to the Nisqually Indian Tribe's restoration of vital salmon estuaries in the Pacific Northwest, Native nations are forging innovative solutions to fisheries challenges that others have failed to solve.⁶ In the process, they are improving the prospects of long-term sustainability of fish ecosystems and resources.

5. The Quinault Indian Nation, for example, was accorded self-regulatory fisheries authority in conjunction with the Boldt Decision due to its extensive track record of responsible fisheries management, from its pioneering of brood stocking, penned rearing, and small-scale enhancement projects to its development of new techniques for stock assessment of razor clams (Gary Morishima, conversation with the author, Feb. 1, 2008). This paper defines innovation generally as the crafting and implementing of a solution to a problem that others have failed—either through indifference or ineffectiveness—to solve.

6. See, for example, Maine Audubon, "Unprecedented Project"; *First Nations Drum*, "Nisga'a Nation Manages Salmon"; and Allen, "Nisqually Reaching Back."

Challenges Facing Native Nations

Despite the positive strides, Native nations on the leading edge of fisheries management in North America have faced an array of increasingly complex impediments to their success. While one Native nation does not face precisely the same set of challenges as the next, there are a number of relatively common obstacles to crafting and implementing strategies for sustainable fisheries management.⁷

Environmental Challenges

Native nations face formidable environmental challenges to their efforts to rehabilitate and protect fisheries and fish resources, including:

- Global warming, with real or potential impacts on everything from water levels and temperature to fish-migration patterns and disease outbreaks
- Degradation of water quality and its attendant impacts on the health of fish and the toxicity of fish for the humans who consume them
- Destruction of fish habitat caused by hydroelectric development, logging, agriculture, or urban development
- Severe depletion of fish stocks due to non-Indigenous over-harvesting and habitat loss⁸
- Endangerment of the genetic integrity of fish species through co-mingling with genetically inferior populations of the

7. This list of challenges was compiled in part from discussions with those individuals listed in the Acknowledgments.

8. Many fisheries experts are predicting the global collapse of seafood resources within a few decades if the prevalent lack of regulation and current fisheries-management regimes prevail (see, for example, Worm, et al., "Impact of Biodiversity Loss"). Inland aquatic species in North America and elsewhere face a similar potential fate. Current salmon runs, for example, are estimated to be roughly one-fifth of their size before the arrival of Europeans (Wilkinson, *Blood Struggle*, 160).

same species (via aquaculture, for example) or the infiltration of invasive species⁹

Legal Challenges

Despite the many critical legal victories that Native nations have achieved, they confront a daunting and increasingly complex legal landscape when exerting fisheries management authority, as manifest in:

- The tangled jurisdictional web that generates a variety of laws and processes for Indigenous fishery operations, which in turn stifles innovation, coordination, the efficient use of funds, and the enforcement of regulations (salmon navigating the Columbia River Basin, for example, traverse more than a dozen jurisdictions)¹⁰
- Disputes with federal, state/provincial, and other governments regarding legal jurisdiction to manage and access trans-boundary fish resources

Political Challenges

Often also standing in the way of Native nations' pursuit of fisheries innovations and sustainability are a number of inter- and intra-governmental political hurdles, such as:

- Competing claims to waterways and their fish resources from politically and financially powerful interests with conflicting objectives (e.g., hydroelectric power developers, sports anglers, the commercial fishing industry), which are exacerbated by increasingly prevalent water shortages

9. For more on Native nations' concerns regarding the impacts of aquaculture on wild fish species, see Urban, *Aquaculture Discussion Paper*, 11-13.

10. For example, the administrative demands involved with coordinating management of a fishery across several jurisdictions can quickly consume precious financial resources best spent in the field (Gary Morishima, conversation with the author, Feb. 1, 2008).

- Powerful, non-Indigenous constituencies capable of making federal and state/provincial elected officials answerable to them and of politicizing scientific data collection and analysis to the detriment of Indigenous fisheries and fish resources¹¹
- Resentment by some governmental and management counterparts and some segments of the general public for the treaty-based fisheries rights and management strategies of Native nations
- Competing goals within Native nations, such as protecting fish species, generating nation income through commercial or recreational fishing, supporting nation citizens through subsistence fishing, etc.
- Interference in the operation of fisheries programs by a nation's elected leaders for political purposes, which hinders staff cultivation and retention and the efficient use of scarce resources
- A poorly informed public that may not comprehend the connection between their quality of life and healthy fisheries and fish resources

Institutional Challenges

Native nations encounter myriad institutional challenges—both internal and external—to meaningful, effective, and sustainable fisheries management, including:

- Long-entrenched, ineffectual management regimes largely perpetuated by non-Indigenous managers content with the status quo

11. In response, a growing number of Native nations are developing their own scientific data and using it in court as a line of defense with increasing success (for more, see Wood, "Restoring the Abundant Trust").

- Uniform, externally imposed, top-down management approaches that ignore local needs and circumstances and eschew deployment of adaptive-management strategies
- Poorly designed or enforced federal or state/provincial fisheries regulations, which leave many fisheries susceptible to ecological degradation
- Lack of internal institutional and technical capacity for sustainable fisheries management
- Difficulty attracting and retaining qualified management staff, in part due to the remote locations of many Native nations, the limited salaries and benefits they often offer, and stiff competition from other employers
- Inadequate or unstable sources of funding to support sustainable management and administrative constraints placed on available funding, which make it difficult to develop institutional capacity or undertake long-term projects¹²
- Poor or nonexistent communication between entities charged with fisheries co-management
- A prevalence of artificial technological fixes meant to repair natural ecological functions¹³

12. For example, according to a recent report published by the U.S. Environmental Protection Agency/ Department of the Interior (EPA/DOL, *Tribal Successes*, 2), “Inefficiencies occur when Tribes are required to follow different procedures from one federal agency to another... In some cases, differences in procedures are drastic enough to discourage Tribes from pursuing federal assistance.”

13. Jaime Pinkham, Watershed Department Manager, Columbia River Inter-Tribal Fish Commission (CRITFC), conversation with the author, Jan. 23, 2008. According to CRITFC (*Tribal Energy Vision*, 5, quoting Independent Scientific Group, *Return to the River*), “Hundreds of millions of dollars have been—and will continue to be—expended on technological ‘fixes’ to compensate for the losses to fish and wildlife attributed to dams. However [d]espite decades of effort, the present condition of most populations in the Columbia River Basin demonstrates the failure of technological methods to substitute for lost ecosystem functions. Normative, or more natural conditions, which provide critical habitat functions in the natural-cultural landscape, must be restored, not mitigated.”



Nez Perce Tribal Hatchery near Cherrylane, Idaho. Courtesy of CRITFC.

So the questions then become: How have Native nations navigated these challenges? How has this complicated, thorny management environment compelled some Native nations to devise innovative solutions to achieve their fisheries-management objectives, and what has fostered their lasting success?

Trends in Indigenous-Led Fisheries Innovation

The movement by Native nations in the United States and Canada to increase their role in fisheries management has kindled a surge in Indigenous-led institutional, political, technical, scientific, and commercial innovations. With its focus squarely on Indigenous self-governance and capable governing institutions, this paper presents four institutionally rooted trends emanating from this movement.

Inter-Tribal Organization

The past 30 years have witnessed an explosion in the number and diversity of Indigenous inter-tribal organizations dedicated in whole or integral part to strengthening fisheries management, including the Northwest Indian Fisheries Commission and the Southwest Indian Fish Commission in the United States and the Atlantic Policy Congress of First Nation Chiefs in Canada.¹⁴ Some have formed pursuant to specific legal rulings, while others have resulted from culturally or regionally affiliated Native nations banding together to maximize their voice at the negotiating and management tables. In some cases, they have revived collaborative natural-resource management partnerships pre-dating colonialism and Native nations' placement on reservations. By pooling and leveraging their limited financial resources, personnel, expertise, and political influence, these intertribal organizations have empowered their member nations to collectively engage non-Indigenous governmental agencies and other fisheries stakeholders with great effect.

In 1984, for example, 11 Native nations residing in the Lake Superior region established the Great Lakes Indian Fish and Wildlife Commission

14. According to Wilkinson (*Blood Struggle*, 310), "The Puget Sound tribes together invented a new kind of institution, the professional intertribal natural resources organization." The tribal co-management movement transcends fisheries. For more on this movement, see Nijhuis, "Wildlife Management Blossoms."

(GLIFWC), a tribally chartered inter-tribal organization committed to implementing the member nations' treaty-reserved rights to fish, hunt, and gather natural resources outside of their reservation boundaries, and to protecting those resources. In the two decades since, GLIFWC has become a major player not only in management decisions concerning Lake Superior, but also throughout the larger Great Lakes region. Among other things, GLIFWC exercises certain fisheries-based police and regulatory powers collectively delegated to the commission by its member nations. GLIFWC's most impressive accomplishment to date is the memorandum of understanding (MOU) it forged in 1999 with the U.S. Forest Service, which established a consensus-based consultation process for federal natural-resource management decisions that impact tribal treaty rights. The MOU has elevated the GLIFWC nations' management role in their off-reservation treaty areas and provided them with the opportunity to demonstrate their resource-management expertise.¹⁵

Inter-Governmental and Inter-Stakeholder Collaboration

The landmark legal battles won by Native nations over the past several decades have transformed the dynamics of fisheries management throughout much of North America, advancing cooperation as a commonly preferred alternative to the costly, time-consuming and uncertain process of litigation.¹⁶ Building upon their legally enforceable management footholds and using the threat of further litigation as added leverage, many Native nations are forging formal partnerships with governments, agencies, corporations, land trusts, and even individuals to advance their fisheries objectives. In so doing, they are expanding their decision-making role and geographic reach in fisheries

15. Harvard Project on American Indian Economic Development (HPAIED), *Honoring Nations 2000 Honoree*.

16. Gary Morishima and Mary Christina Wood, conversations with the author, Feb. 1, 2008. Among many Native nations, "The collaborative conservation model has emerged as an alternative to deadlocked negotiations and protracted court battles over natural resource management" (Cronin and Ostergren, "Democracy, Participation, and Native American Tribes," 527).

management and improving the stability, competence, and sustainability of management regimes. Just as importantly, they are cultivating relationships predicated on mutual trust and respect with other fisheries stakeholders—many traditional adversaries—for the benefit of all. As one watershed department manager, reflecting on the track record of his inter-tribal fisheries organization, recently remarked, “While litigation and negotiation are both difficult paths to take, the difference is the outcome. The outcome [of negotiation] is the mutual benefits.”¹⁷

In the early 1990s, for example, the Menominee Indian Tribe of Wisconsin spearheaded the formation of a collaborative process designed to develop a plan to rehabilitate lake sturgeon to viable levels in Menominee Reservation waters. Since the rehabilitation plan’s success depended on the involvement of non-tribal anglers fishing sturgeon in nearby, off-reservation waters and the agencies responsible for managing those waters, the plan established the Menominee Reservation Lake Sturgeon Enhancement Committee. Composed of representatives of both tribal and non-tribal management agencies, the committee identified common restoration objectives and strategies that all those with an interest in local lake sturgeon could support. By 2001, the collaborative revitalization effort had produced enough mature lake sturgeon to support spawning in the reservation’s Wolf River for the first time in a half century.¹⁸ Efforts like those of the Menominee are flourishing across North America, demonstrating the power of collaboration.

Localization of Fisheries Management

In moving to increase their decision-making role, Native nations are localizing the management of fisheries. They are shedding intransigent, ineffective management programs imposed by non-Indigenous government agencies in favor of grassroots management initiatives tailored to

17. Pinkham, “Native Nation Building” television series.

18. Runstrom, et al., “Lake Sturgeon on the Menominee Indian Reservation.”

the unique conditions and challenges of each fishery. They are relying directly on local people, who best know the state of the fishery and its resources and can best assess the impacts of different management strategies. They are placing decision-making power directly in the hands of those who have suffered the consequences of poor management and who stand to benefit from good management, a change geared toward ecosystem sustainability. Such changes endow the management effort with the flexibility to respond swiftly to pressing challenges to fisheries health. Just as important, they promote the integration of tribally held ecological knowledge in management strategies, which is increasingly viewed by non-Indigenous fisheries managers as a vital complement to Western science in formulating and implementing sustainable fisheries-management strategies.¹⁹

For example, several years ago, the Yakama Nation in Washington set out to boost local wild spring chinook salmon populations while at the same time preserving the genetic fitness of these populations. Relying on the expertise of its 40-employee fisheries department and the local ecological knowledge of its people, the nation established a hatchery and research facility in cooperation with the regional hydroelectric company that cultivates genetically fit salmon through an experimental “boot camp” process known as supplementation.²⁰ Rooted in nature’s intended ecological processes and tailored to the intricacies of the local habitat, the hatchery has yielded seven times the number of returning adult fish as compared to wild spawning, producing a 70 to 90 percent

19. See, for example, Cronin and Ostergren, “Democracy, Participation, and Native American Tribes,” 530; Tsosie, “Tribal Environmental Policy”; and Menzies and Butler, “Returning to Selective Fishing,” 458.

20. The Yakama Nation’s fisheries department is among the largest tribal fisheries departments in the United States. The supplementation process is proving the hypothesis “that new artificial production of fish can be used to increase natural production and to improve harvest opportunities, while maintaining the long-term genetic fitness of the native salmonid populations and keeping adverse ecological interactions within acceptable limits” (Northwest Power and Conservation Council, *Success Stories—Yakama Fisheries Project*). The hatchery puts half of its hatchlings through “an innovative ‘boot camp’ in real-world survival skills so that future generations will behave like naturally wild fish” (Thornburgh, “Saving Salmon on the Yakama”). The hatchery’s acclimation and release process is designed to promote the young salmon’s adjustment to local, natural stream conditions “and imprint the location in their sensory memories” so that they will return as adults to spawn naturally in that location (Columbia River Inter-Tribal Fish Commission (CRITFC), *Wy-Kan-Ush-Mi Wa-Kish-Wit: Plan Status (1999-2001)*).

increase in spring chinook returns.²¹ At Yakama and in many other places, localized management is making those who manage fisheries and use fish resources accountable for their actions; it also enables them to benefit directly from their own good management.

Adaptive, Ecosystem-Based Management

Seeking to return the fisheries upon which they depend to a healthy state, Native nations have appropriately focused much of their time and resources on shifting fisheries management away from approaches predicated on legal/political boundaries toward those predicated on ecological ones. Whereas their federal and state counterparts often develop, fund, and administer programs confined to particular fish species and sub-ecosystem jurisdictions, Native nations are developing new management strategies—or reinstating traditional ones—to address the challenges of entire ecosystems, to the benefit of the myriad animal and plant species they support.²² Accompanying this approach is the deployment by Native nations of adaptive-management regimes, which involve the continual adjustment of management policies and techniques based on ongoing, systematic assessment of their effectiveness in order to maximize their positive impacts on fisheries and fish resources.

Over the past few decades, the Jamestown S’Klallam Tribe, a small Native nation in Washington State with about 600 citizens and a tiny land base comprising less than 100 acres, has aggressively developed an adaptive fisheries-management system that transcends its own borders to encompass the salmon-giving Dungeness River watershed and

21. It should be noted that Yakama’s supplementation program is not without its critics. Some wild-fisheries organizations contend that the program will dilute the genetic composition of wild salmon (Mary Christina Wood, conversation with the author, Feb. 1, 2008).

22. The Endangered Species Act is a prime example of the U.S. government’s overarching tendency toward species-based fish management as opposed to ecosystem-based management. Conversely, for example, the Columbia River Inter-Tribal Fish Commission has developed a comprehensive, “gravel-to-gravel” recovery plan that seeks to combat all of the major threats (hydro, habitat, harvest and hatcheries) impacting the Columbia. Called *Wý-Kan-Ush-Mi Wa-Kish-Wit* (Spirit of the Salmon), the plan is now being replicated elsewhere by federal and state biologists (for more, see CRITFC, “Wý-Kan-Ush-Mi Wa-Kish-Wit, Spirit of the Salmon”).

beyond. Relying on its highly skilled natural-resources department staff, the tribe is proceeding to restore endangered salmon runs and secure harvest opportunities for its citizens through the negotiation of fish quotas. Building a web of local, regional, and even international partnerships with other management entities, it has transformed scientific assessment of the Dungeness, greatly improving the effort of all co-management parties to respond efficiently and effectively to actual and impending ecological challenges to fish habitat and resources. Through strategic planning, restoration programs, water quality studies, public education projects, and various other initiatives, the tribe is exerting a management presence that transcends its small size for the good of the larger salmon ecosystem.²³

.....

Still other trends are emerging as Native nations push the fisheries-management envelope further and further, such as: Native nations' re-acquisition of Aboriginal lands to expand their fisheries conservation efforts, increased scrutiny of the science that federal agencies use to make and justify management decisions, the elevation of tribal staff to prominent leadership positions in multi-jurisdictional management regimes, and the emergence of internationally renowned Indigenous leaders in the fisheries arena.²⁴

23. For a detailed overview of the Jamestown S'Klallams' approach to fisheries management, see Cronin and Ostergren, "Tribal Watershed Management," 91-95.

24. Gary Morishima and Mary Christina Wood, conversations with the author, Feb. 1, 2008. For more on the movement by Native nations to re-acquire vital fisheries habitat, see Wood and Welcker, "Tribes and Trustees Again (Part I)."

Case Studies in Indigenous-Led Fisheries Innovation

The trends discussed previously—and others—are embodied in the three detailed case studies presented below, which demonstrate the sorts of Indigenous-led fisheries innovations that can result when Native nations strategically and methodically work to enhance their decision-making role in fisheries management.

Yukon River Inter-Tribal Watershed Council

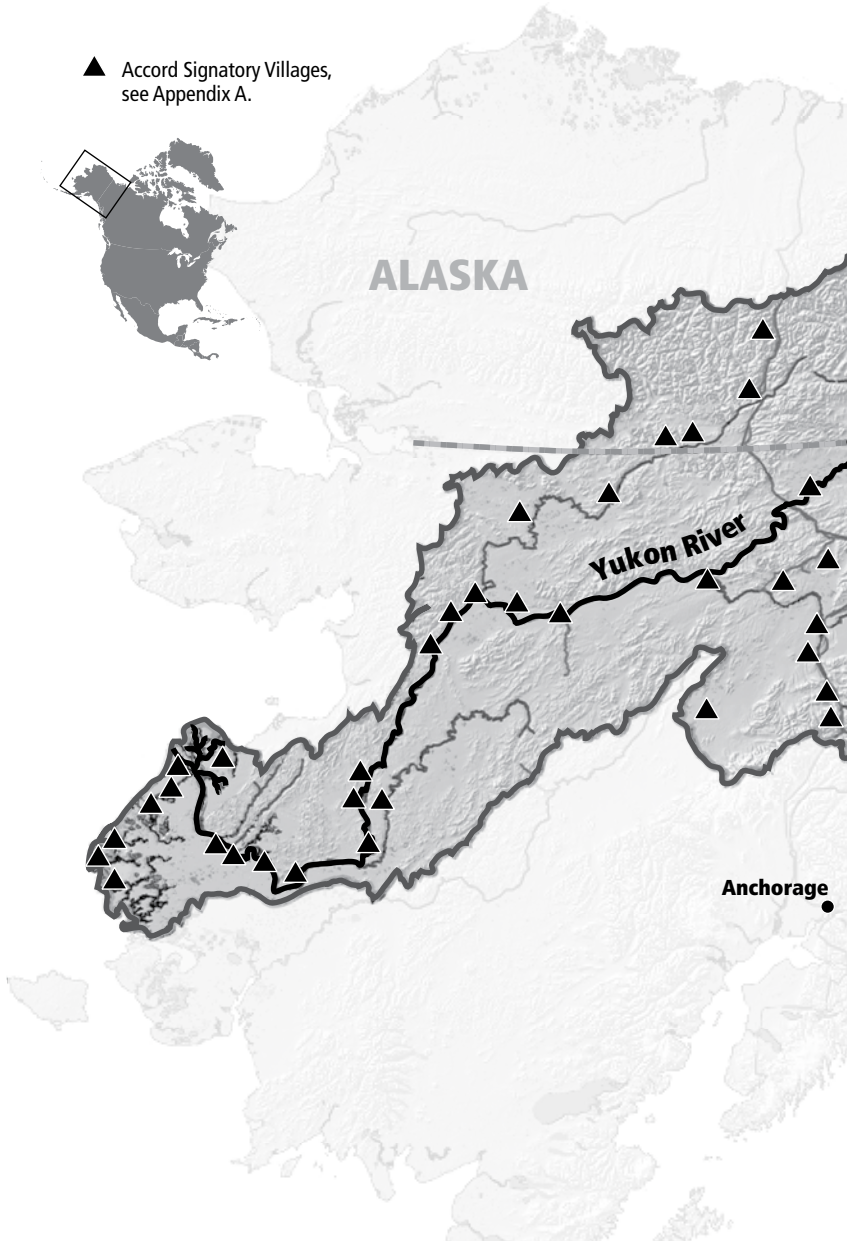
Prior to the council, very little was done up and down the Yukon. The communities each had to speak for themselves... Before, we couldn't articulate our voices with force. Now with the council, we have the force of many voices.

— Peter Captain, Sr., Former Alaska Region Chairman,
Yukon River Inter-Tribal Watershed Council²⁵

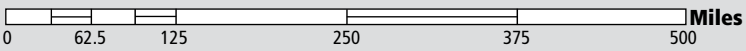
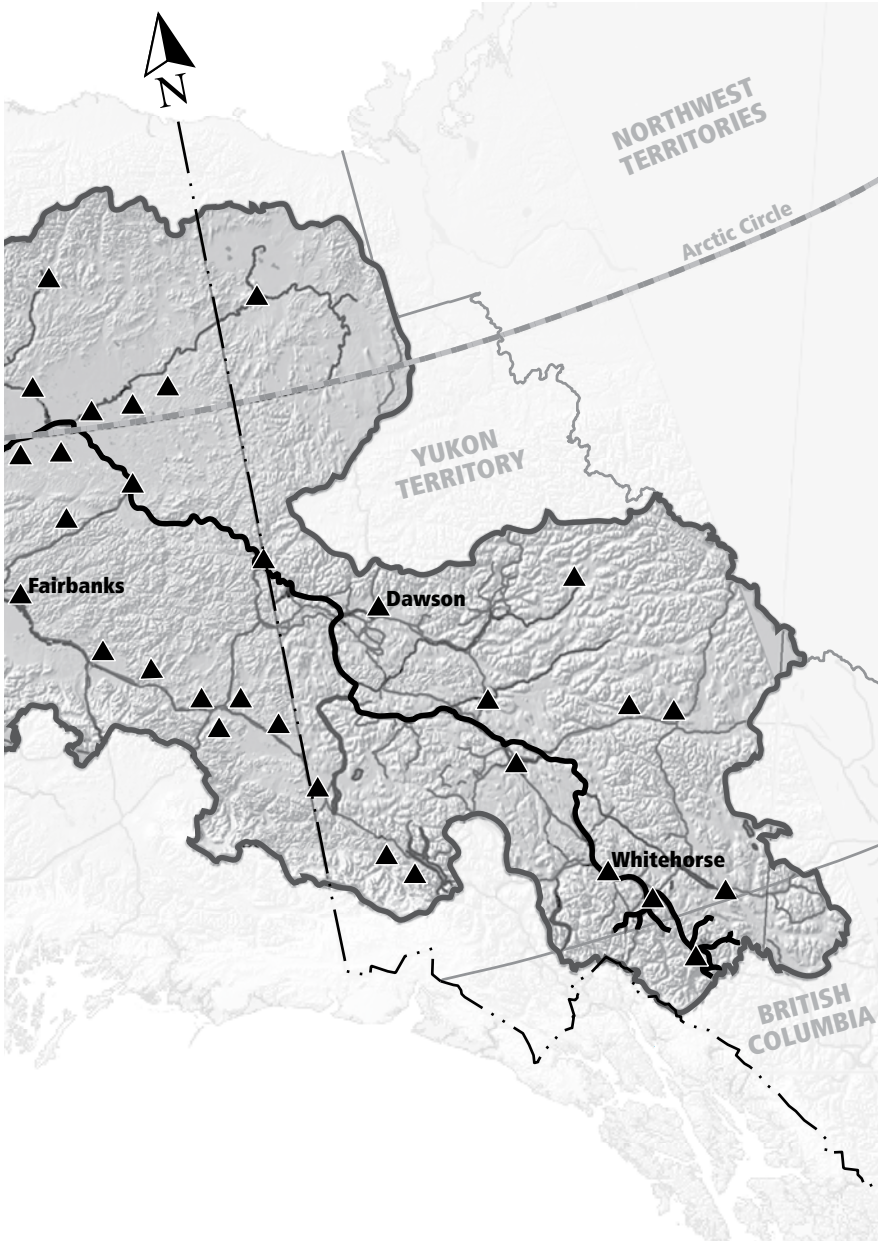
The Yukon River stretches 2,300 miles, coursing from its point of origin in northern British Columbia in Canada through the Yukon Territory and then traversing Alaska before emptying into the Bering Sea. Its immense watershed—which covers more than 300,000 square miles, an area roughly twice the size of California—supports the world's longest and largest inland run of Pacific salmon as well as a variety of highly specialized and sensitive freshwater fish, plant, and other wildlife species.²⁶ The watershed, particularly along the banks of the river and its major tributaries, also is home to more than 20,000 Indigenous people representing more than six dozen Native nations (Figure 1).

25. Interview with the author, Oct. 24, 2006.

26. Yukon River Inter-Tribal Watershed Council (YRITWC), website and YRITWC, *Success Stories*. According to one YRITWC environmental assessment report (Environmental Dynamics, Inc., *Yukon River Inter-Tribal Watershed Council*, iii), "The plant, wildlife and fish populations are representative of a harsh climate, characterized by long, cold winters, low precipitation and a short vegetation-growing season. This harsh environment likely contributed to...highly specialized and sensitive plant, wildlife and fish populations, higher than other parts of North America."



**Yukon River Watershed and Signatory Villages to
Yukon River Inter-Tribal Watershed Council Accord**



Sources: YRITWC and nationalatlas.gov

Figure 1 | 17

For these peoples, the venerated Yukon serves as the nucleus of cultural and physical life, providing drinking water, a mode of transportation, the foundation of ceremonial and traditional practices, and vital food sources.²⁷ With unemployment eclipsing 60 percent in most villages, few roads to speak of, and some of the lowest per capita incomes on the continent, the majority of the watershed's Indigenous inhabitants rely on subsistence fishing and hunting as their primary means of sustenance.²⁸ Trout, whitefish, pike, and burbit are among the subsistence staples found in the watershed's streams and creeks, as is the culturally integral, river-running salmon, which local inhabitants also fish commercially in some places.

Over the past several decades, widespread ecological devastation has wreaked havoc on the Yukon River ecosystem and its abundance of life-giving resources. Contamination from industrial and municipal solid waste, untreated or insufficiently treated human sewage, poorly built and located landfills, and growing recreational activity have produced scores of point and non-point pollution sources throughout the watershed. Perhaps most damaging has been the toxic-waste runoff from the region's mines, active and abandoned military installations, and a series of large oil and chemical spills.²⁹ Beginning in the 1970s, the watershed started to plainly exhibit the ill effects of this multi-jurisdictional mass of pollution. Subsistence hunters and fishermen began observing disturbing anomalies—such as tumors, cysts, and blackened livers—in the watershed's fish and wildlife, anomalies that grew in frequency and severity over time. These unmistakable signs of widespread disease sounded the alarm to the watershed's Indigenous communities that pollution—coupled more recently with the awareness of climate change in the form of warming water—was causing both

27. YRITWC (Alaska Region Office), *Yukon River Unified Watershed Assessment*; Peter Captain, interview with the author, Oct. 24, 2006.

28. Rob Rosenfeld, YRITWC International Development and Policy Adviser, interview with the author, Oct. 13, 2006; Lovgren, "Native American Tribes Vow to Clean Up Yukon River." The YRITWC estimates that the Yukon River and its surrounding lands provide more than half of the resident Native peoples' food in the form of fish, moose, ducks, and other animals.

29. YRITWC, *Success Stories*.

the river and their way of life serious and perhaps irreparable harm.³⁰ Under-regulated, large-scale commercial fishing by non-Natives only exacerbated the environmental stresses on the watershed's fish populations, sparking huge declines in a number of species, notably salmon.

Unfortunately, the hodge-podge of U.S. and Canadian federal, state, and provincial agencies responsible for managing the watershed on either side of the international boundary proved to be no match against the vast expanse and complexity of this ecological crisis and its many root causes. With each entity working largely in isolation on its own designated portion of the watershed, bureaucratic in-fighting obstructing opportunities for collaboration, and high overhead costs precluding a comprehensive scientific assessment of the watershed's health, the agencies charged with stemming the tide of ecological damage failed miserably.

The more than 75 Native nations inhabiting the watershed did what they could to compel effective regulatory action, but their individual pleas and ideas for a comprehensive, sustainable solution to the crisis typically fell on deaf ears. Each nation "struggled alone" to have its voice heard on local watershed conditions and what should be done; meanwhile, the various regulatory agencies imposed multiple poorly conceived and funded environmental-remediation initiatives that ignored both local ecological knowledge and the trans-boundary nature of the problem.³¹

Realizing the futility of this piecemeal approach, in 1997 chiefs and elders representing 34 Native nations spread across more than two thousand miles—including many with little previous experience working

30. Rosenfeld, interview with the author, Oct. 13, 2006; Peter Captain, Sr., interview with the author, Oct. 24, 2006.

31. According to the YRITWC, prior to its establishment, "each community [was] struggling alone against a huge, integrated political-economic-military system that does not even recognize tribal territorial jurisdiction in Alaska. Thus, the tribes [were] minimally empowered to solve their own problems, [were] constantly confronted with proposals and zero-sum solutions from outsiders, and then told they must make these solutions work" (Rosenfeld, interview with the author, Oct. 13, 2006).



Community members blessing a traditional vessel made by local Paul Herbert, Fort Yukon, Alaska. Photo by Jon Waterhouse. Courtesy of YRITWC.

with one another and some former enemies of one another—banded together to establish the Yukon River Inter-Tribal Watershed Council (YRITWC) to forge a comprehensive, interdependent management solution to the challenge of restoring the entire watershed’s ecosystem to good health.³² YRITWC’s mission statement simply seeks “To be able to drink water directly from the Yukon River.” In practical terms, however, its charge is three-fold: reclaim the watershed’s damaged areas, prevent existing contaminants from wreaking further ecological havoc, and keep additional pollutants from permeating the watershed.

To meet these challenges, the council’s signatory nations forged the *YRITWC Accord*, creating a formal system of mutual and collective accountability designed “to plan, monitor, protect and enhance the environmental integrity of the Watershed and the cultural vitality of its peoples through cooperation, communication and education.”³³ This

32. Currently, there are 66 nations represented on the council among 76 Native nations located within the watershed (62 Cupik, Yupik, Koyukon and Gwich’in Athabascan communities spread across Alaska and 14 Gwich’in Athabascan and Tlingit First Nations residing in Canada), many with distinct cultures and histories and even past conflicts between them.

33. YRITWC, *YRITWC Accord*.

historic agreement grants each member nation a seat on the YRITWC's board of directors, an advisory body that convenes every two years to systematically review the watershed's environmental health and issue recommendations based on the guiding principles of its elders (among them respect, integrity, honesty, patience, and tenacity).³⁴ Implementing those recommendations is the job of the YRITWC's governing body, a 12-member executive committee (with six members each from Alaska and Canada) that meets quarterly to develop short- and long-term action plans, which are then carried out by YRITWC staff. These plans jointly further the council's overall goals for the watershed and its individual member nations' efforts to address community needs and concerns and craft locally tailored solutions that draw upon community knowledge and expertise.³⁵ The entire organization assumes an advocacy position only when the board of directors reaches a consensus, makes decisions that respect the inherent sovereignty of its member nations, and eschews action when it advances the interests of one nation at the expense of another.³⁶

In the decade since its establishment, the YRITWC arguably has become the region's premier environmental-remediation program, proving wrong those skeptics who thought the organization "delusional" for attempting to tackle the entire Yukon River watershed.³⁷ It has empowered its now 66 member nations (see Appendix A) to assert direct, substantive decision-making authority in response to critical watershed-management challenges—nations that due to their small population sizes, remoteness, and politically controversial status

34. YRITWC, "Yukon River Inter-Tribal Watershed Council Receives High Honors," 11.

35. When necessary, the executive committee polls the board of directors for advice in between the summits it holds every two years. With 501(c)(3) non-profit status in the United States and equivalent Societal Status in Canada, the YRITWC maintains fiscally separate U.S. and Canadian offices in order to maximize and efficiently administrate grant funding.

36. YRITWC, *Success Stories*. The executive committee also is empowered to make an advocacy decision if they are certain that all of the YRITWC's member nations would support that position. As a rule, the YRITWC refrains from competing with its member nations for grant funding.

37. Rosenfeld, interview with the author, Oct. 13, 2006.

as sovereigns likely would otherwise not have been heard.³⁸ In so doing, the organization is working methodically toward its ultimate goal: a watershed in good health.

The YRITWC's success stems from its comprehensive approach to watershed management. Among its most notable initiatives is its Unified Water Assessment (UWA), the first-ever systematic, ecosystem-based assessment and mapping of point and non-point pollution sources throughout the watershed. In addition, the YRITWC provides technical assistance to member nations; develops model co-management agreements for use by those nations and other stakeholders (such as municipalities and land owners); works with the watershed's villages and towns to implement community-based solid-waste management, cleanup, remediation, and recycling programs; facilitates landfill and sewage-lagoon improvements and new construction; oversees an integrated backhauling program for removing toxic waste and recyclable materials; develops reclamation plans for military and mining sites responsible for contaminating the watershed; and educates its member nations, other management agencies, and the general public about ways to promote the watershed's health.³⁹

Key YRITWC staff and executive committee members point to three main factors driving the organization's progress:

Local capacity-building

Explicit in the organization's accord is its commitment to developing technical expertise at the grassroots level so that its member nations can assist the council with the immense challenge of managing the watershed.⁴⁰ It conducts regular training sessions designed to teach local Indigenous people how

38. HPAIED, *Honoring Nations 2005 Honoree*.

39. For example, the YRITWC organized the first-ever dialogue between the watershed's Indigenous communities and the U.S. military regarding adverse impacts of military contamination.

40. In 2007, the YRITWC employed 20 full-time staff (14 year-round and six seasonal). It also relies on the environmental workers employed by its member nations and community volunteers.

to monitor, analyze, and improve water quality, a vital asset for responding swiftly and effectively to emergent environmental threats. It also actively grooms members of its constituent communities to assume senior management positions traditionally held by non-Natives. Largely through the YRITWC's efforts, the number of tribal environment programs operated by its member nations has increased tenfold (from 4 to 40) over the past decade. The YRITWC relies on these programs to perform the lion's share of the work on the ground, elevating the role and legitimacy of traditional ecological knowledge in management and cultivating a sense of local ownership in sustaining the watershed's viability in the process.



Jon Waterhouse gathering scientific data on the Yukon River. Photo by Larry Zerckel. Courtesy of YRITWC.

Strategic partnerships

With limited dollars and few personnel of its own, the YRITWC has taken an “inclusive” approach to managing the watershed by forging strategic, mutually beneficial partnerships with traditional allies, traditional adversaries, and others in order to maximize the on-the-ground impact of its modest resources.⁴¹ In addition to alliances with the U.S. Geological Survey, U.S. Environmental Protection Agency, U.S. Bureau of Land Management, State of Alaska, Yukon Territory, and a growing number of non-tribal municipalities, the YRITWC has built working relationships with nearly two dozen transportation partners, including the Alaska Railroad, airlines, and barge lines. Over the past four years, these partners have backhauled—at no charge—more than eight million pounds of toxic waste and recyclable materials out of Native villages for proper disposal in licensed and regulated facilities.

Investment in science

Realizing that a lack of systematic information about the health of the watershed was the biggest obstacle to its proper management, the YRITWC made scientific data collection and analysis its top priority. Through the UWA and other ongoing projects, it is generating far more scientific data with far less funding than its management counterparts, testing more sites with more frequency than ever before.⁴² It is developing baseline water-quality standards designed to systematize enforcement of environmental regulations by management authorities throughout the watershed. Over the past ten years, it has built a state-of-the-art information clearinghouse, positioning itself as the preeminent expert on the Yukon River. Other management agencies, recognizing its unrivaled institutional capabilities

41. YRITWC, “Yukon River Inter-Tribal Watershed Council Receives High Honors,” 1, 11.

42. Rosenfeld, Oct. 13, 2006.

and facing funding cutbacks of their own, increasingly defer to the YRITWC on critical management tasks and decisions. The U.S. Geological Survey, for example, has formally turned over monitoring of key watershed sites under its authority to the YRITWC, and the U.S. Environmental Protection Agency has officially approved the council's water-quality assurance plan. Its water-testing results are admissible in court, helping to make those who are managing and using the watershed accountable for their conduct.⁴³

The YRITWC essentially has become the central nervous system for management and rehabilitation of the Yukon River watershed. In light of its success, several more Native nations residing within the watershed have joined the council and accord of late, and recently two non-Indigenous municipalities signed a memorandum of understanding agreeing to adhere to the accord's principles.⁴⁴ According to Peter Captain, Sr., "As the villages learn more and more, they are seeing the benefits of participating in the Council. They are realizing that we are non-political, and are only concerned with sustaining their subsistence way of life. ... Collectively, we are moving mountains."⁴⁵

Subscribing to the mantra "share everything," the YRITWC openly shares its model co-management agreements, strategic plans, resolutions, and by-laws as well as its know-how and data with Native nations seeking to bring sustainable management to other watersheds. To date, its dissemination efforts have inspired the development of a half dozen other inter-tribal, watershed-management organizations.⁴⁶

43. HPAIED, *Honoring Nations 2005 Honoree*. In one case, council staff testified to the downstream impacts of the dumping of raw sewage by the city of Dawson. Consequently, the Premier of the Yukon Province must now report to the YRITWC on the progress of upgrades to the city's waste disposal system.

44. The number of Indigenous signatory governments represented on the council currently stands at 66. According to Rosenfeld, the council is considering establishing MOAs (memorandums of agreement) with non-tribal municipalities that would grant them non-voting advisory capability (interview with the author, Oct. 13, 2006).

45. Interview with the author, Oct. 24, 2006.

46. The YRITWC's success also has influenced the formation of several non-Indigenous watershed

Red Lake Walleye Recovery Project

We have to remember that we don't inherit our land and resources from our ancestors. We borrow it from our children and grandchildren.

— Judy Roy, Red Lake Band of Chippewa⁴⁷

For centuries, the Red Lake Band of Chippewa, located in northern Minnesota, depended on its namesake lake for its cultural lifeblood. Considering it a sacred gift from their creator, the people also relied on the lake and its plentiful array of fish, notably the prized walleye, as their main source of nourishment, referring to it as their “food store” or “food warehouse.”⁴⁸ Consequently, the Red Lake people have always worked to protect the lake for the generations to come. In 1889, for example, Red Lake chiefs resisted the General Allotment Act on the grounds that preserving the band’s lands and waters for its exclusive, communal use was of paramount importance to the survival of the people and their culture.⁴⁹ Their actions resulted in the Red Lake Band becoming one of two “closed” reservations in the United States, which accords the band virtually unfettered jurisdiction over its lands and waters, including the 83 percent of Red Lake that falls within the reservation boundaries (Figure 2).⁵⁰

Subsistence fishing on Red Lake was historically considered an “honorable” lifestyle and a family affair, providing band citizens with

councils in Europe and elsewhere. For details, see Arizona Native Net, “Yukon River Inter-Tribal Watershed Council.”

47. Miron, “Walleye Return.” Eric Henson contributed to the development of the Red Lake walleye case study.

48. Haga, “A Long Year at Red Lake”; Kolpack, “Walleye Fishing Returns to Red Lake.”

49. The chiefs rejected the General Allotment Act, or Dawes Act (1887), on the grounds that individual ownership of land was a concept utterly foreign to the Red Lake people.

50. In rejecting the General Allotment Act, the Red Lake chiefs believed they were reserving the entirety of Red Lake for exclusive use by their people, but the State of Minnesota subsequently appropriated the easternmost portion of the lake’s upper half, a development which has been a source of legal and political tension for the past century (Al Pemberton, Red Lake Department of Natural Resources (DNR) director, interview with the author, July 2006).

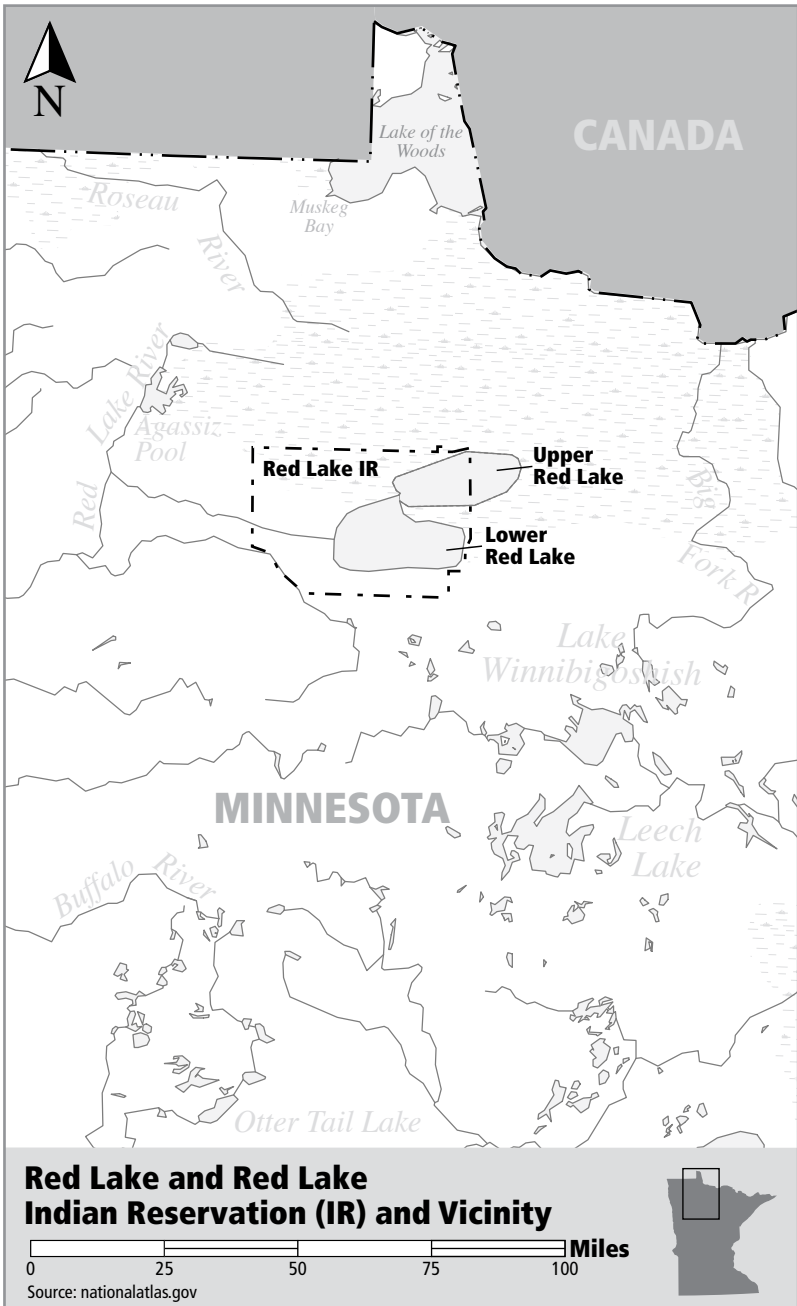


Figure 2 | 27

a sense of purpose and relatives with an opportunity to bond with one another. For the young, it provided a sense of identity and responsibility, teaching commitment, independence, reliability, and the value of hard work.⁵¹

In 1917, however, food shortages brought on by World War I prompted the State of Minnesota to establish a commercial fishery on Red Lake. Twelve years later, the Bureau of Indian Affairs (BIA) took over management of the fishery on behalf of the Red Lake Band, instituting a static, non-scientific harvest quota for walleye that both ignored the lake's health and failed to provide proper regulation. The Red Lake Fisheries Association (RLFA), a co-op established by the band's new commercial fishermen, failed to control the number of Red Lake citizens setting gill nets on Red Lake or the number of nets each person was allowed to set. The organization also routinely asked the BIA for quota extensions, which were always granted regardless of the lake's walleye population at the time.⁵² Meanwhile, on the lake's state-controlled waters, scores of non-Indian anglers regularly exceeded their catch limits of walleye. All told, lack of enforcement by and communication between the managers of both sides of Red Lake—combined with a lack of assessment of the number of fish leaving the lake—encouraged rampant overfishing. It also fueled a flourishing black market that both Indians and non-Indians perpetuated and which reportedly doubled the annual legal take of walleye.

Suffering from the mounting pressure of decades of overfishing, Red Lake's walleye population began to experience boom-and-bust cycles in the 1970s and 1980s, an omen of the species' impending collapse. But soaring walleye prices continued to lure more and more Red Lake citizens, in search of a good living, into commercial fishing. The RLFA, which supplemented its members' income with season-ending bonuses, saw its membership surge from 200 to 700 by the early 1990s and

51. Bill May, conversation with the author, July 2006.

52. Haga, "A Long Year at Red Lake."

its documented annual harvest top out at 950,000 pounds—eclipsing the static quota and far exceeding the lake’s capacity.⁵³ Then came the crash. In 1996, RLFA harvested a meager 15,000 pounds, one of a growing number of signs that the Red Lake walleye had been fished to the brink of extinction.

Witnessing firsthand the stark decline of the walleye and recognizing that a vital cultural and economic resource was slipping away, perhaps for good, the RLFA—by this time composed largely of second- and third-generation commercial fishermen—took action. In 1997, on behalf of the walleye and its long-term recovery, the Red Lake fishermen tied their own hands. By an overwhelming margin, the RLFA voted to discontinue all commercial gill-net fishing on Red Lake. With their main source of income now gone, many fishermen were forced to look elsewhere to make a living, selling their boats and gear and taking up logging, construction, or jobs in the band’s casinos. At about the same time, then-Red Lake Chairman Bobby Whitefeather—recognizing that rehabilitating the walleye required the State of Minnesota’s cooperation—initiated a dialogue with the state’s Department of Natural Resources. Demonstrating that it was serious about walleye recovery, the Red Lake Band Council passed a resolution in 1998 banning all band citizens from subsistence fishing for walleye by hook-and-line, effectively ending all walleye fishing on band waters. The state soon responded, establishing a catch limit of two walleyes for anglers fishing on the state-managed portion of Red Lake.

Further discussions culminated in the forging of a formal historic partnership between the Red Lake Band and the State of Minnesota in 1999, highlighted by the parties’ signing of an inter-governmental memorandum of understanding (MOU), a first in the history of tribal-state relations.⁵⁴ Among other things, the MOU reaffirmed the band’s walleye ban, prohibited walleye fishing on Red Lake’s state

53. Niskanen, “Tribe, Anglers Greet Return of Walleye.”

54. The BIA also signed the MOU.



Al Pemberton, Director, Red Lake Department of Natural Resources. Photo by Ian Record. Courtesy of NNI.

waters, and mandated strict regulation of the moratorium on both sides of the lake. Renewable by the parties after ten years, the MOU also established a multi-partner technical committee—composed of scientists and other representatives from the Red Lake Department of Natural Resources (DNR), RLFA, Minnesota Department of Natural Resources, University of Minnesota, BIA, and the U.S. Fish and Wildlife Service—and charged it with devising and managing the walleye-recovery effort and ensuring its long-term sustainability.

Recognizing that there was enough blame to go around regarding the walleye's demise, the technical committee turned its attention to the future, resolving to work together to identify and implement a solution. Adopting governing principles of mutual respect, shared science, and consensus decision-making, the committee launched an unprecedented recovery plan designed to bring the walleye back to Red Lake through massive fry stockings, stringent enforcement of the fishing ban, and comprehensive data collection to assess the quantity, maturity, diversity, and natural reproduction capability of the walleye population

as it recovered.⁵⁵ In a testament to the spirit of their cooperation, the band and the state agreed to share equally the cost of the restoration. A number of fisheries biologists doubted the Red Lake effort could succeed given the lake's immense size and jurisdictional complexity, not to mention the failure of other walleye recovery projects.⁵⁶ Others, including those on the technical committee, estimated the recovery effort would take about 10 years to return the Red Lake walleye to a naturally reproducing, self-sustaining level.

The recovery effort far exceeded even the most optimistic expectations. Rebounding from an all-time low of roughly 100,000 in the late 1990s, the walleye in Red Lake numbered a robust 7.5 million in 2006 and boasted several strong year classes of sexually mature fish capable of spawning.⁵⁷ The lake's walleye population is now able to rely fully on natural reproduction, the clearest sign of the renewed health of the species. According to several members of the technical committee, the revitalization of the walleye is among the most successful inland fishery recoveries ever undertaken in North America.⁵⁸

Red Lake Band natural-resource managers and other public officials attribute the success of their massive recovery effort to several critical factors, chief among them:

- The band's decision to become a "self-governance" tribe, which allowed it to assume administration of vital tribal programs—such as its Department of Natural Resources—and swiftly carry out the restoration effort free of the BIA's momentum-choking bureaucracy⁵⁹

55. Rivers, "Red Lake," 14.

56. Anderson, "Rebirth. Renewal. Red Lake."

57. Niskanen, "Tribe, Anglers Greet Return of Walleye."

58. Robertson, "Waskish Stakes a Future on Walleye"; conversations with author, July 2006.

59. Red Lake negotiated a self-governance agreement with the U.S. government in accordance with the 1988 and 1994 amendments to the 1975 Indian Self-Determination and Education Assistance Act. According to Dave Conner, administrative officer of the Red Lake DNR, "One of the reasons Self-Governance works is that we can make decisions faster" (Simcosky and Holmes, *Proud Nations*, 111).

- The band government's unwavering political support of the recovery effort and its elected leadership's commitment to allow the band's natural-resource managers to do the jobs they were hired to do, which endows the effort with continuity⁶⁰
- Strict compliance with the walleye-fishing moratorium on Red Lake, particularly in tribal waters—the result of a community-wide commitment to the recovery effort and aggressive enforcement⁶¹
- The band's considerable investment of both dollars and people in cutting-edge, scientific data collection and assessment, which has positioned the band as an authority on Red Lake's health and how best to manage it⁶²
- The technical committee's ability to generate a single, comprehensive picture of the lake's health and the walleye's strength, predicated on the free exchange of data between band, state, and federal natural-resource managers
- The committee's consensus approach to decision-making, which insulates it against political divisiveness and interference and demonstrates a commitment to impartiality
- The committee's strategic, two-pronged approach of short-term recovery and long-term sustainability

The walleye's resurgence prompted the band and the state—with the technical committee's endorsement—to reopen Red Lake to subsistence

60. For more on the negative impacts of political interference in program administration among Native nations, see Cornell and Jorgensen, "Getting Things Done for the Nation," 147-172.

61. Red Lake deployed game wardens to routinely patrol the lake to ensure adherence to the moratorium. According to Pat Brown, fisheries director of the Red Lake DNR, the Red Lake DNR documented only one gill-net violation of the moratorium by a Red Lake citizen between 1997 and 2006, a level of civic compliance rarely achieved in fisheries management (interview with the author, July 2006).

62. *Ibid.*

and sport fishing in the spring of 2006, well ahead of schedule.⁶³ Whereas a lack of regulation once was the norm, the walleye harvest is now managed methodically and cautiously by the technical committee in accordance with its strategic plan for long-term sustainability. The committee has established a process for determining seasonal harvest quotas for the entire lake based on the health of its spawning walleye stocks and allocates numbers proportionately to the band and state based on ownership of Red Lake.⁶⁴



Red Lake Fisheries employees process walleye from Red Lake anglers at the band's state-of-the-art plant. Photo by Ian Record. Courtesy of NNI.

The technical committee's sustainable harvest plan and authority to manage the harvest—along with the Red Lake Band's claim to 83 percent of the harvest quota, its 83 percent ownership of the lake, and its decision to exclude non-citizen anglers from fishing tribal waters—has sparked vehement challenges by non-Indian anglers and anti-tribal

63. The Red Lake Band is proceeding deliberately in deciding whether and how to re-establish a commercial fishery, as both the band government and citizens have resolved to insure that the walleye can sustain itself and the people's subsistence and cultural needs before considering its economic development potential (Al Pemberton, Dave Conner, Pat Brown, interviews with the author, July 2006).

64. The technical committee determines the seasonal harvest quotas based on pounds-per-acre mature-female biomass.

sovereignty groups.⁶⁵ Thus far, however, the united front forged by the band and the state through the work of the technical committee has proven effective in rebuffing those challenges and ensuring the walleye's sustainability. For example, the band and state's natural-resource departments are working as partners in key aspects of harvest enforcement, jointly educating the general public about the scientific rationale for the catch limits and promoting TIP (Turn In Poachers) phone hotlines to turn in those who violate limits. According to Al Pemberton, Red Lake's DNR director, "Before, the band and the state didn't know what the other was doing. There's cooperation now, both on the lake's biology and its enforcement."⁶⁶

Ultimately, the technical committee serves as an effective, dynamic mechanism through which the Red Lake Band can advance the prerogative of its citizens to "never again allow their self-proclaimed 'food store' or 'storehouse' to run dry,"⁶⁷ so that the walleye can bring future generations of Red Lake people the same physical and cultural sustenance it brought their ancestors.⁶⁸ In late 2007, in a striking testament to the walleye's health, the band re-established the commercial fishery on Red Lake.

65. Prior to re-opening tribal waters to walleye fishing, Red Lake citizens, responding to a survey distributed by the band, voted overwhelmingly to prohibit non-band citizens from fishing on its waters. The band also is developing strong regulations for walleye fishing on Red Lake waters, including a system of fines for trespassing by non-citizen anglers (Pemberton, interview with the author, July 2006).

66. Anderson, "Rebirth. Renewal. Red Lake." The Red Lake and Minnesota natural-resource departments are also discussing a number of future collaborative projects, including the construction of a fish passage through a 70-year-old dam that will enable young walleyes that leave Red Lake the chance to return, thereby increasing the lake's resident population.

67. Kolpack, "Walleye Fishing Returns to Red Lake."

68. The Red Lake Band recently developed a plan to resume commercial fishing of walleye in Red Lake in order to boost its reservation economy (Melmer, "Red Lake Walleye Make Comeback").

Tulalip Tribes and the Snohomish Basin BioGas Project

It's very exciting partnering with the farmers. What we have learned is that we both want and care about the same things; we want to ensure our cultures and lifestyle for the next generation, be it farming or fishing.

— Herman Williams, Jr., Former Chairman, Tulalip Tribes⁶⁹

The Tulalip Tribes together form a federally recognized Indian nation that lives along the Puget Sound in western Washington State (Figure 3). Composed of the region's Snohomish, Snoqualmie, Skagit, Suiattle, Samish, Stillaguamish, and allied bands, the Tulalip Tribes reside on the Tulalip Reservation, established in 1855 by the Treaty of Point Elliott. Surrounded by streams that bear the names of their ancestors, the nation's 22,000-acre reservation is an area rich with natural resources, most notably prime, Pacific, wild-salmon habitat in the form of marine waters, tidelands, fresh-water creeks, and wetlands.⁷⁰ Salmon have long been vital to the Tulalip Tribes, as affirmed in the Point Elliott Treaty, which "further secured" their aboriginal right "of taking fish at usual and accustomed grounds and stations."⁷¹

The Tulalip Tribes traditionally fished the waters and tributaries of the Skykomish River, one of Puget Sound's most important conduits for Pacific wild salmon.⁷² By the 1970s and 1980s, however, salmon stocks in the Skykomish watershed had plummeted to dangerously low levels due to a surge in urban development, logging, and farming that destroyed or altered significant stretches of critical salmon habitat.⁷³

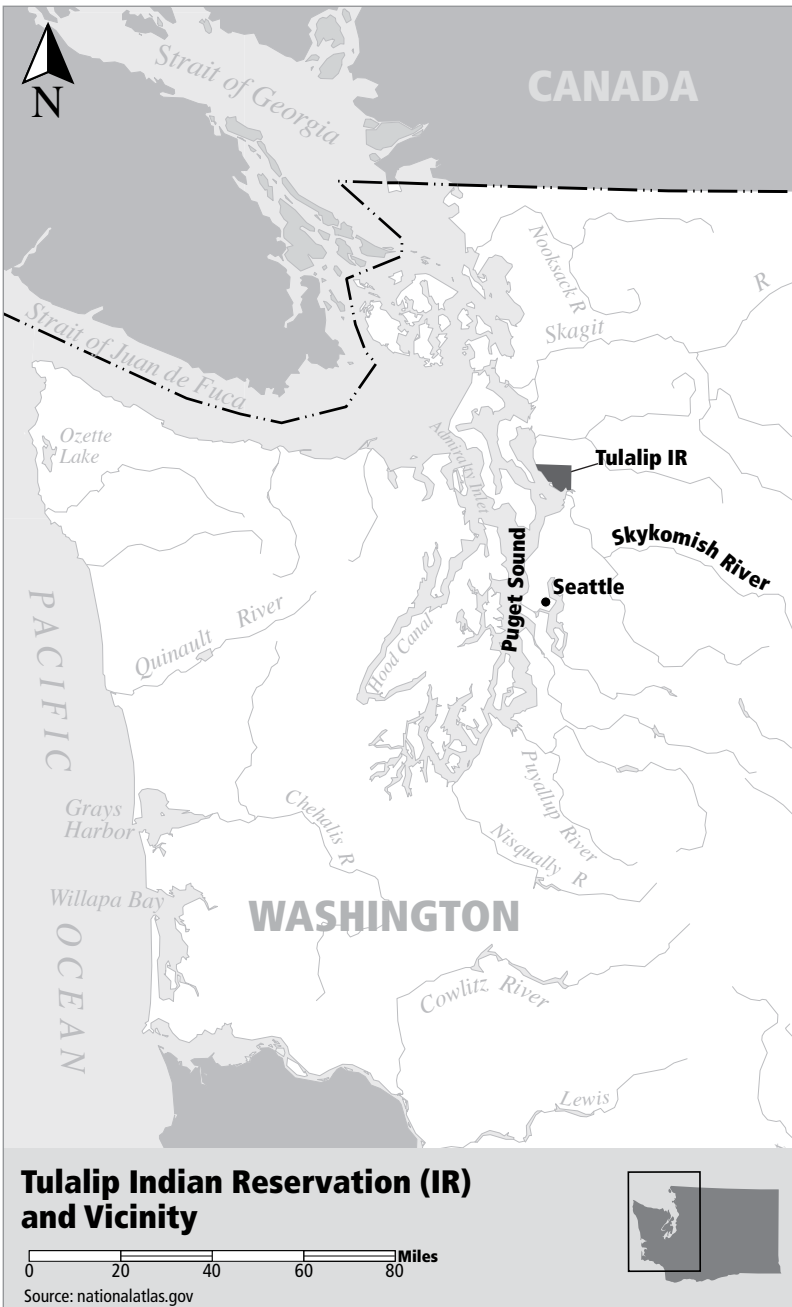
69. *Tulalip-Quil Ceda Messenger*, "Snohomish County BioGas Project," 3.

70. Eichenseher, "Tribal Recovery Efforts"; Tulalip Tribes, tribal website.

71. Treaty of Point Elliott, 1855, Article 5.

72. The Skykomish currently is "the second most important wild salmon river in Puget Sound," boasting "15-20 percent of the threatened wild chinook and one half of the remaining wild coho" (Sayre, "A Partnership for Fish and Farms," 6).

73. According to Eichenseher ("Tribal Recovery Efforts"), a recent study of the Skykomish River system



The salmon-dependent economy and the tribe's culture have suffered accordingly ever since. For example, where local salmon populations allowed the Tulalip Tribes to issue 130 commercial fishing licenses annually to tribal citizens in the mid-1980s, currently they issue just 30 licenses per year.⁷⁴

For years, the scarcity of salmon and the degradation of their habitat contributed to tense, sometimes volatile relations between the Tulalip Tribes and the area's non-Indigenous property owners over the impacts of land and water use on the Skykomish watershed. The relationship between the tribe and dairy farmers was especially divisive, with the tribe insisting that extensive, untreated, cow-manure runoff from dairy farms was tainting local ground water and surface water, raising the ambient temperature of the Skykomish, and altering its chemical and nutritional composition to the detriment of the salmon and the tribal people.⁷⁵

Local dairy farmers—who long blamed tribal-treaty fishing rights for restricting their ability to expand their operations to stay competitive—proved slow to respond to the tribe's concerns.⁷⁶ Facing a mounting crisis of their own in the shape of urban encroachment, increased industry concentration, lower milk prices, and newer, stricter regulations limiting herd sizes, farmers were reluctant to change their waste-management practices, fearing that implementation of salmon-friendly alternatives would prove more costly, making it even more difficult for them to stay in business.⁷⁷

"indicates that about three-quarters of the original habitat structure has been altered, making waters less inhabitable for many species."

74. Quil Ceda Power Corporation, "Snohomish Bio-Gas Initiative."

75. Johnson, "Tulalip Tribes and Farmers"; Tribal Energy Program, *The Tulalip Tribes of Washington*. Manure runoff "produces high concentrates of fecal coliform (a bacteria) in ground and surface water." This in turn produces lower oxygen levels and higher water temperatures, which "are bad for fish" (*Tulalip-Quil Ceda Messenger*, "Snohomish County BioGas Project," 3). The Skykomish Valley through which the Skykomish River runs has long been prized by dairy farmers for its exceptional grass production. According to one local dairy farmer, the valley is "one of the best places to raise cows in the world" (Sayre, "A Partnership for Fish and Farms," 6). Snohomish County is a hotbed of agricultural activity, boasting more than 1,200 farms (Eichenseher, "Tribal Recovery Efforts").

76. Johnson, "Tulalip Tribes and Farmers."

77. *Tulalip-Quil Ceda Messenger*, "Snohomish County BioGas Project," 3. The farmers asserted that

With the future of wild salmon in the Skykomish hanging in the balance, the Tulalip Tribes made the restoration of local salmon habitat its top priority.⁷⁸ Following an integrated, ecosystem-based approach to the problem, the Tulalip Natural Resources Department formulated a strategic plan to rehabilitate salmon spawning and rearing habitat throughout the watershed, a plan that melds cutting-edge science with traditional cultural knowledge. The department's goal is to restore up to 80 percent of the Skykomish's historic salmon runs.⁷⁹ Its strategies for meeting this goal include securing exclusive management authority over tribal waters, strengthening the tribe's standing as a co-manager of shared waters with federal and state governments, and recasting the adversarial relationship that has long existed between the tribe and area farmers, homeowners, and logging companies by identifying innovative land-use solutions that benefit both the salmon and non-tribal landowners.⁸⁰

“continued restrictions on land—from Indian treaty rights and other limitations to farming along streams that traverse their fields—have strangled the economic options that keep them in business” (Kamb, “A Methane to their Madness”). According to the Quil Ceda Power Corporation (“Snohomish Bio-Gas Initiative”), “limitations on waste disposal have restricted the ability of dairy operations to increase their herd sizes. As dairies elsewhere in the country attain increased efficiencies from increasing herd sizes, Snohomish-area dairies are placed at a competitive disadvantage. New state and federal CAFO [Confined Animal Feeding Operation] regulations hold the potential to only exacerbate this situation...”

78. Tribal Energy Program, *The Tulalip Tribes of Washington*.

79. Quil Ceda Power Corporation, “Snohomish Bio-Gas Initiative”; Eichenseher “Tribal Recovery Efforts.” The Tulalip's approach to sustainable fisheries management and development addresses salmon recovery on several different fronts. Aside from operating a hatchery that bolsters depleted salmon stocks, Tulalip has developed a number of innovative habitat-related projects designed to “pay for themselves.” One such project is its new wastewater treatment facility, which serves the tribe's Quil Ceda Village commercial park. Using a state-of-the-art membrane technology, the facility generates a “99.9% pure” effluent from the wastewater, which is then used for non-potable needs such as landscaping, agricultural irrigation, and flushing toilets in the tribe's casino and hotel, thus reducing the tribe's consumption of potable water drawn from local aquifers (*Tulalip-Quil Ceda Messenger*, “The Future of Clean Water,” 3). A plan also is in the works to use some of the treated water to increase flows to local salmon tributaries after it is first enriched with the necessary nutrients in a man-made wetland (Terry Williams, Tulalip Commissioner of Fisheries and Natural Resources, interview with the author, July 21, 2005). Another innovative project currently in the planning stages is the tribe's restoration project along the delta below the confluence of the Skykomish and Snohomish Rivers. The project aims to remove dikes—composed of high-grade sand and gravel—on a 600-acre tract of inactive riverside farmland. The proceeds the tribe generates from the sale of the sand and gravel will be used to supplement federal and state grant dollars for restoring salmon habitat in the delta (*Ibid.*). All of the tribe's restoration and recovery projects are developed in concert with the tribe's micro-climate analytical model, which the Tulalip developed in order to predict future threats to the local salmon ecology and mitigate those threats before they occur. According to Williams, this state-of-the-art strategic tool was developed over the course of a decade and “carefully incorporates” traditional cultural knowledge about salmon and the local water they inhabit (*Ibid.*).

80. Eichenseher, “Tribal Recovery Efforts.” According to Terry Williams, the tribe has developed and is



Harvey Eastman, Tulalip Tribes, checking dissolved oxygen levels in a creek that flows through the reservation. Courtesy of NWIFC.

In 2001, Tulalip tribal leaders—encouraged by the gesture of one local dairy farmer to repair the salmon habitat running through his property—opened an informal dialogue with a number of dairy farmers to determine if there was a way they could preserve and rebuild salmon habitat while simultaneously strengthening the area’s agricultural industry.⁸¹ The two sides found common ground in their shared recognition that widespread urban development of the Skykomish Valley posed the greatest threat to both fish and

farms, as it would mean more people, more pollution and a higher demand for water.⁸² Working from a consensus that warding off urban sprawl holds the key to sustaining both local salmon and agriculture, they developed a win-win solution: turn livestock waste into a salmon-friendly and farm-friendly source of renewable energy.⁸³ In 2003, the

promoting a federal bill that, if passed, would create a pilot water co-management project based on alternative dispute resolution designed to achieve two complementary objectives: the affirmation of tribal jurisdiction over tribal trust waters, and the establishment of a mediation forum in which tribes and the State of Washington could resolve water management disputes in a much more timely and efficient manner than litigation, which has proven incredibly costly and largely ineffective in recognizing tribal rights to manage fisheries (interview with the author, July 21, 2005).

81. Kamb, “A Methane to their Madness”; Quil Ceda Power Corporation, “Snohomish Bio-Gas Initiative.” According to Terry Williams, “One of the reasons we needed to engage the farming community is that we view farmers a lot like our fishermen—independent, tied to the land and water, working hard for what they produce. The more we see of landscape locked up, the less we see the viability of our tribal culture” (Johnson, “Tulalip Tribes and Farmers”).

82. According to the Northwest Indian Fish and Wildlife Commission, urban development in the Puget Sound region is “decimating much of what remains of the region’s once highly productive salmon habitat. Growth in the region is expected to continue, creating the urgent need to take meaningful steps to protect and restore ecosystems that support salmon and other life” (Northwest Indian Fisheries Commission (NWIFC), *Tribal and NWIFC Wild Salmon Recovery Efforts*, 23).

83. Kamb, “A Methane to their Madness.” According to dairy farmer Andy Werkhoven, “The Tulalips came to use a pretty simple philosophy: ‘We believe cows would be better in these valleys than condos.’ We, as farmers, couldn’t agree more” (Johnson, “Tulalip Tribes Find Common Ground”).

Tulalip Tribes and the farmers, represented by the Washington State Dairy Federation, forged a landmark inter-organizational agreement with the Lower Skykomish River Habitat Conservation Group and Northwest Chinook Recovery to create the Snohomish Basin BioGas Project.

The project, ultimately designed “to fill the gaps in federal and state salmon recovery plans,” involves construction of a state-of-the-art biogas plant that will pump livestock manure and associated wastes from several local dairy farms, convert them into electricity, and thus reduce waterway pollution.⁸⁴ Using a 20-year-old energy technology known as anaerobic digestion, the plant will break down waste from more than 2,000 cows each day to produce methane, which will be used as fuel for electricity-producing generators.⁸⁵

The ecological and economic benefits of the biogas plant are many and wide-ranging. Most important to the Tulalip Tribes, processing the manure will improve the quality and lower the temperature of local ground water and surface water, helping make the water salmon-friendly again.⁸⁶ The facility also will reduce greenhouse-gas emissions, reduce the public-nuisance, odor problems of land-spread manure, and produce a “green fertilizer” that can be packaged and sold commercially.⁸⁷ For the farmers, the livestock waste disposal option provided by the biogas plant enables herd expansion in accordance with state law and improves the economic viability of their

84. Eichenseher, “Tribal Recovery Efforts.” There are a reported 50 to 80 biogas digesters in the United States, including 29 facilities operating at dairy farms. The Snohomish Basin facility is the first of its kind in the State of Washington and the third in the Pacific Northwest (Johnson, “Tulalip Tribes and Farmers”).

85. *Tulalip-Quil Ceda Messenger*, “The Future of Clean Water,” 3; Kamb, “A Methane to their Madness.” The electricity the plant generates will be uploaded to the Snohomish County Public Utility District grid. Once at full capacity, the plant will produce enough energy each day to power 200 homes (Eichenseher, “Tribal Recovery Efforts”). According to Tulalip Tribes Environmental Liaison Daryl Williams, four farmers have already agreed to participate, and another two or three are expected to join. The facility also is expandable to accommodate additional farmers if the need arises (interview with the author, June 11, 2005).

86. According to Daryl Williams, it will take about a year from the time the plant begins operating for local water quality to improve (interview with the author, June 11, 2005).

87. *Tulalip-Quil Ceda Messenger*, “The Future of Clean Water,” 3.

operations in the long run.⁸⁸ According to former Tulalip Tribal Chairman Herman Williams, Jr., “The great thing about this project is that there are so many pluses. We create green electricity, green fertilizer, clean water, and improved fish habitat, all the while helping farmers turn a cost center into an asset center.”⁸⁹

This surprising alliance piqued the interest of the federal government, prompting it to allocate significant funding for research and construction of the biogas facility.⁹⁰ The State of Washington also joined the project, providing 277 acres of land on which to build the plant. The tribal government is doing its part, contributing significant funding to supplement federal grant support for the project.⁹¹ The newfound spirit of cooperation between the tribe and local farmers already has spawned other collaborative restoration efforts, chief among them the joint identification, purchase, and preservation of land parcels that feature salmon habitat.⁹²

Just as impressive as this multifaceted partnership is the Tulalip Tribes’ development of subsidiary ventures that will feed off the biogas plant. The heat and residual effluent generated by the biogas process, for example, will be used to warm and water a nursery for native plants, which will be planted in local tributaries to rejuvenate salmon

88. According to dairy farmer Dale Reiner, the conventional disposal of cow manure “can be quite an expense for dairy farmers...This project may literally mean the difference between shutting down family farms and allowing them to thrive” (*Tulalip-Quil Ceda Messenger*, “The Future of Clean Water,” 4). While some have voiced opposition to the planned biogas plant because farmers will be able to expand what they feel are environmentally harmful animal feeding operations, the Tulalip insist “there would be a net benefit to the environment from the project” (Eichenseher, “Tribal Recovery Efforts”).

89. *Tulalip-Quil Ceda Messenger*, “The Future of Clean Water,” 3.

90. The U.S. Department of Energy gave \$256,000 for a feasibility study, while the U.S. Department of Agriculture awarded \$500,000 for the building of the plant, a sizable chunk of the overall construction cost, estimated at between \$1.5 and \$2.5 million (Johnson, “Tulalip Tribes and Farmers”).

91. Another important partner is Energy Northwest, an energy cooperative comprised of 19 member public utilities from across the state, which will be in charge of operating the facility (Daryl Williams, Interview with the author, June 11, 2005).

92. Kamb, “A Methane to their Madness.” According to Tulalip government affairs liaison Kyle Taylor Lucas, “we really see this as a way to restore salmon runs and keep farms viable. And in terms of the long-term conflicts there have been between tribes and farmers, this partnership is absolutely unique” (*Ibid.*).

spawning and rearing habitat.⁹³ The remaining effluent will be supplied to participating farmers and sold to area nurseries for irrigation. The Tulalip Tribes also plan to use heat that the plant generates to “cook down” fish waste, which when added to the cattle waste, will increase the plant’s electrical output. Other plans include uploading biogas-generated electricity to Quil Ceda Village, a tribal municipality and commercial park, which will reduce the tribes’ energy bill.⁹⁴ As part of the nation’s overarching drive for self-sufficiency, all commercial proceeds generated by the plant and its related enterprises will be reinvested in those ventures.⁹⁵

Tribal leaders expect that once the plant goes online, it will promote widespread awareness of and support for innovative salmon recovery efforts throughout the Puget Sound region.⁹⁶ According to tribal officials, Tulalip also hopes that the biogas project will serve as a striking testament to the fact that sustainable solutions to the complex challenge of restoring salmon habitat and stocks reside not within conventional political confines, but within creatively tailored organizational arrangements that bridge political and cultural divides and attend to local needs and objectives.⁹⁷

93. According to Daryl Williams, Tulalip tribal members will be employed to run the native plant nursery (interview with the author, June 11, 2005).

94. Terry Williams, interview with the author, July 21, 2005.

95. Daryl Williams, interview with the author, July 20, 2005.

96. Eichenseher, “Tribal Recovery Efforts.” According to Daryl Williams, if revenues generated by the plant allow, the main partners in the biogas project hope to build an interpretive center that will educate the general public about the plant as well as the historical and contemporary significance of both salmon and agriculture to Snohomish County (interview with the author, July 20, 2005). The Swinomish and Sauk-Suiattle Tribes in Washington State also have developed an innovative project that works with local farmers to restore critical habitat on agricultural lands (NWIFC, *Comprehensive Tribal Natural Resource Management*).

97. Terry Williams, interview with the author, July 21, 2005.

Lessons from Indigenous-Led Fisheries Innovations

Indigenous-led fisheries innovations arise first and foremost from Native nations' effective exercise of their sovereign powers as nations. Yet a broad review of the advances Native nations are making in the United States and Canada reveals other common keys that facilitate and empower their efforts to devise, implement, and maintain innovations designed to strengthen their management authority and, in turn, the fisheries they are committed to sustaining.

National Commitment

Community agreement that fisheries sustainability is a priority gives fisheries innovations a sense of permanence that insulates them from destabilizing forces such as budget cut-backs by external funders, internal political factionalism, and strategic ambiguity. Such consensus promotes compliance with management regulations by nation citizens, who believe in the rules they have sanctioned together as a community. In addition, it instills management accountability, because to exercise poor management



Tony Moses, Tulalip Tribal Fisheries technician, conducting estuary study. Courtesy of NWIFC.

threatens severe negative consequences for the community. As illustrated by the Tulalip Tribes case, strategies crafted and sustained over time by Native nations in the Pacific Northwest—where protecting salmon and other aquatic species is an explicit expression of the people’s sovereignty, culture, and identity—suggest that cultural traditions can play a pivotal role in driving this commitment and generating community consensus. However, among nations where protecting, managing, or developing fisheries is not a top community priority, innovative programs and projects are difficult to start, much less sustain.

Strategic Planning

Successful Native nations forge a strategic vision for fisheries management, reinforce the vision with comprehensive short- and long-term plans designed to turn that vision into reality, and commit the necessary resources to make their plans work. Just as important, in order to realize their ultimate goals, they ensure these plans can be adapted as circumstances change.⁹⁸ Effective, ecosystem-based management plans—particularly those involving joint action by Native nations, and federal and state agencies—take years if not decades to develop and implement. This reality mandates clear, strong, and sustained vision and an ability to continue activities through political cycles.⁹⁹ Native nations with vision, plans, and resources endow the fisheries development effort with critical staying power and, as necessary, the ability to fill voids when partners experience institutional, political, and fiscal instability (such as staff turnover, funding cutbacks, and ebbing political commitment).¹⁰⁰

The Little River Band of Ottawa Indians in Michigan, for example, recently launched an initiative designed to return sturgeon in self-sustaining quantities to the Big Manistee River. Because fewer than

98. Gary Morishima, conversation with the author, Feb. 1, 2008.

99. Cronin and Ostergren, “Democracy, Participation, and Native American Tribes,” 537.

100. Jaime Pinkham, conversation with the author, Jan. 27, 2008.

500 sturgeon currently use the river to spawn, and they only reproduce every four to nine years, the band has devised a 20-year plan for their restoration through a groundbreaking method known as streamside rearing. The method is designed to ensure that the few sturgeon fry produced each year survive their pivotal first months and reach a mature age so they can spawn in the river.¹⁰¹ Tribal leaders and natural-resource managers have forged collaborative partnerships with the U.S. Fish and Wildlife Service, Army Corps of Engineers, and Forest Service to secure the necessary ongoing logistical, technical, and financial support for this long-term effort.¹⁰²

Achieving Politics of Scale

The Yukon River case demonstrates the wisdom of achieving “politics of scale” as a critical first step toward gaining and maintaining substantive fisheries management authority.¹⁰³ Many Indigenous-led innovations in North America are the result of Native nations deliberately amplifying their political voice at the management table by joining forces with one another when and where necessary.

The Columbia River Inter-Tribal Fish Commission (CRITFC) is a prime example. Formed by the Yakama, Umatilla, Nez Perce, and Warm Springs Tribes in 1977 to protect their treaty-reserved rights and ensure coordinated management of the Columbia River as mandated in *U.S. v. Oregon*, the consensus-based organization presents a unified Indigenous voice on critical public-policy issues that affect the river’s entire watershed.¹⁰⁴ In the three decades since its establishment, CRITFC has leveraged the pooled resources of its member tribes to great political and scientific advantage. In the process, it has transformed the Columbia

101. This method—now being replicated by other tribal and state natural resource departments—involves catching newborn sturgeon and raising them for several months in a resident hatchery using the Manistee River’s own water, thus preserving their genetic integrity and giving them the best chance of survival (LeMay, “Little River Band”).

102. *Ibid.*

103. Gary Morishima, conversation with the author, Feb. 1, 2008.

104. 302 F. Supp. 899; 1969 U.S. Dist. LEXIS 9899.

River fisheries-management regime from one exclusively shaped by sub-ecosystem political boundaries to one appropriately geared toward sustaining the watershed's ecological expanse. According to Executive Director Olney Patt, Jr., CRITFC's commitment to strength in numbers has positioned its member nations as the region's leaders of innovation, a standing no single nation could have achieved on its own: "The tribes are ... taking their long-sought place in research and innovative project implementation—from goal-driven research related to genetics and hatchery practices, to on-the-ground projects such as those in the Clearwater and Warm Springs watersheds."¹⁰⁵

Cooperation

As cases like the Tulalip BioGas Project demonstrate, Indigenous-led fisheries innovations are often dependent on cooperation between Native nations and other fisheries stakeholders. This strategy has proven particularly productive following litigation—or as an alternative to litigation. For example, Native nations that leverage their legal victories by forging creative partnerships with federal and state agencies, private industry, foundations, non-profit organizations, academic institutions, neighboring land owners, and others enhance their potential to develop solutions tailored to their particular fisheries-management challenges.¹⁰⁶ Capitalizing on litigation through collaboration is an approach that has taken root among many Native nations—particularly in the Pacific Northwest, with the Columbia River and Puget Sound co-management regimes being the most striking examples. According to Singleton, "Through the late 1970s and early 1980s, the [State of] Washington fisheries were a textbook example of how little a regulatory system can accomplish if it must rely solely on formal, coercive authority. ... [I]n the subsequent decade the two sides [Native nations and the State of Washington] were able to create a relationship based on at least a measure of mutual respect and to design a set of

105. CRITFC, "Message from the Executive Director."

106. EPA/DOI, *Tribal Successes*, 3.

institutions that worked far more effectively than those instituted by the court.¹⁰⁷

Sustained collaboration promotes many innovation-enabling benefits for Native nations, including: (1) the continued leveling of the management playing field between Native nations and their federal and state counterparts, (2) the reduction or elimination of program redundancy, which maximizes partners' often limited financial and human resources, (3) the concentration of management authority in the hands of linked local decision-makers who can capitalize on their local resource knowledge for better whole ecosystem management, (4) the increased likelihood of receiving financial support for programs and projects,¹⁰⁸ and (5) the gradual building of trust and respect, which can neutralize longstanding feelings of hostility and bitterness and even foster other cooperative projects.

A recent case from Vancouver Island offers a compelling example of just such benefits. In the 1990s, leaders of the Huu-ay-aht First Nations were eager to rehabilitate the Sarita River, which had been severely damaged by widespread erosion caused by decades of clear-cut logging. Thus, they initiated a dialogue with the timber company about rebuilding the river's natural course and repairing and expanding the watershed's salmon-spawning habitat. Discussions culminated in a creative partnership in which the timber company suspended its clear-cutting practices and contributed funds for habitat restoration along the river. In exchange, Huu-ay-aht permitted the timber company to log carefully selected trees from its own sacred forest and committed its portion of the proceeds from the harvest to the restoration effort.¹⁰⁹ The project also has fostered more amiable relations between Huu-ay-aht and its non-Native neighbors.

107. Singleton, "Common Problems, Collective Action and Efficiency," 379.

108. Cronin and Ostergren, "Democracy, Participation, and Native American Tribes," 536.

109. Huu-ay-aht First Nations, "Return of the River." Huu-ay-aht ensures that the harvest of trees from its sacred forest are done in an "ecologically and culturally sensitive manner," and prohibits the harvest of "culturally modified trees" (CMTs) that show evidence of use by Huu-ay-aht ancestors over several generations.

In the United States, the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) in Oregon initiated the Umatilla Basin Salmon Recovery Project in 1980 to restore water and salmon to the Umatilla River while also protecting the local non-Indian economy, which is dependent on irrigated agriculture. The core of this ecosystem-based restoration plan is an innovative water-swapping agreement in which local irrigators agreed to relinquish their claims to water from the Umatilla and instead receive water piped from the Columbia River in order to raise the Umatilla's flow to a level sufficient to bring salmon back.¹¹⁰ According to Antone Minthorn, Chairman of CTUIR's Board of Trustees, the project epitomizes the tribes' management approach to overcoming water-use conflicts with its neighbors: "If we have to, we will litigate to protect our treaty-reserved rights, but we have seen that we can create solutions which meet everyone's needs by sitting down with our neighbors, listening to each other, and developing our own solutions. . . . We believe the cooperative process between neighbors can be used as a model for success in the region and beyond."¹¹¹

While its benefits are undeniable, collaboration is not an easy answer. It is an organic and complex process that requires Native nations to make strategic investments in relationship building and nurturing on par with their investments in fisheries. But as the cases above illustrate, while waging the continuing battle to protect and ensure rights to fish is critically important, successful and lasting innovation depends on a Native nation's commitment to have its work begin—and not end—there.

110. This process "does not affect Columbia River water flows because every bucket of water removed from the Columbia River is replaced with a bucket of water flowing in from the Umatilla" (HPIAIED, "Umatilla Basin Salmon Recovery Project").

111. CTUIR, Confederated Tribes of the Umatilla Indian Reservation website.

Technical Capacity-Building

Practitioners and students of Indigenous fisheries management concur that Native nations' systematic cultivation of internal technical capacity is a prerequisite for exercising substantive management authority and fostering innovation.¹¹² Native nations that aggressively build their scientific knowledge and expertise in fisheries often move into the driver's seat of fisheries management relative to other stakeholders. Examples abound in North America of Native nations, many with small populations and land bases, committing significant human and financial resources with the end goal of achieving unrivaled competency in fisheries management.

For instance, in the early 1990s, the Nisga'a Nation in British Columbia joined with Canada's Department of Fisheries and Oceans (DFO) to form Nisga'a Fisheries, an inter-governmental organization charged with managing the Nass River fishery and its salmon resources. At the heart of Nisga'a Fisheries is its Joint Fisheries Management Committee—a six-member technical committee composed of two representatives each from the Nisga'a Nation, the Canadian federal government, and the provincial government of British Columbia—that develops the annual fishing plan for Nass River, recommends it to the DFO for approval, and then oversees plan coordination.¹¹³ In the 15 years since the organization was formed, the Nisga'a Nation has invested heavily in its technical infrastructure. It has hired and retained fisheries staff expert in a number of critical management areas and fortified this internal capacity through relationships with a diverse array of scientific partners, including other First Nations; non-profit research institutions; universities; and Canadian, provincial, and state natural-resources departments.¹¹⁴

112. Cronin and Ostergren ("Tribal Watershed Management," 90), for example, attribute the swell of successful Indigenous-led fisheries innovations in the Pacific Northwest to "the tribes' ability to demonstrate competence in managing the resource, drawing upon Indigenous and Western science in cooperation with local and regional partners as well as strong ties to a salmon culture."

113. Nisga'a Nation, *Prosper*.

114. *Ibid.*; Nisga'a Lisims Government, *Nisga'a Fisheries Program, 2005*.

Relying on this first-rate technical capacity, the Nisga'a Nation was instrumental in the institution of an entirely new fisheries-management system for the Nass River. Today, the nation plays an integral role in adaptive river management, generating the bulk of the scientific data used to assess and protect the river's health. For example, while the nation is not formally responsible for assessing steelhead, trout, and shellfish, it decided to systematically study these species because of their importance to the Nass River fishery's long-term health.¹¹⁵ In so doing, Nisga'a is demonstrating its capabilities as a competent, reliable manager of the fishery.

Proving that knowledge is indeed power, federal, state, and other management entities on the Nass River and elsewhere increasingly are turning to Native nations to develop and implement innovative solutions to critical fisheries-management challenges because they recognize that those nations are in a position—and have the knowledge—to contribute directly to successful management strategies.

Strong Institutional Memory

Innovative solutions to fisheries challenges developed by Native nations at Red Lake, in the Snohomish Basin, along the Yukon River, and elsewhere benefit from the long tenures and strong institutional memory of key management players. Where Native nation leaders and citizens are clear about the long-term objectives of their fisheries programs, and where those charged with managing programs understand the programs' origins, objectives, assets, limitations, and options, innovations stand a better chance of prospering. The process of generating and sustaining fisheries innovations is as much a byproduct of firsthand knowledge about what doesn't work as it is of knowledge about what does work—knowledge that comes from sustained, hands-on experiences with a particular fishery and its unique ecological intricacies. Continual turnover of project officers in federal agencies often impairs

115. Nisga'a Lisims Government, *Nisga'a Fisheries Program*, 2005.

the ability of those agencies to maintain project continuity and communicate effectively with fisheries co-managers.¹¹⁶ But Native nations committed to building the institutional memory of their fisheries departments—by cultivating permanent, expert staff who are knowledgeable about the benefits and costs of collaboration, the drawbacks of litigation and adversarial approaches, the specific details of particular projects, who the nation can rely on and who it shouldn't—equip themselves to respond swiftly and effectively to management challenges. Over time, as these managers learn from their successes and failures, they improve the efficiency and effectiveness of their programs. In so doing, they also improve the ability of their nations to raise additional program funds to retain talented, experienced managers and hire new ones.¹¹⁷

116. EPA/DOI, *Tribal Successes*, 2.

117. EPA/DOI, *Tribal Successes*, 4.

Policy Recommendations for Native Nations

The emergent trends in Indigenous-led fisheries innovations and the key factors underpinning their development suggest a number of policy recommendations that a Native nation should consider in crafting its own approach to sustainable fisheries management.¹¹⁸

Provide effective, stable governance

As in other areas of Indigenous community life, sustainable fisheries management benefits from the ongoing exercise of stable, capable, governing institutions. A natural-resource department, for example, tends to be much more effective when there is continuity in its goals and it can pursue those goals without having to contend with the disruptions that political interference or micromanagement by elected leaders can cause.

Identify the nation's strategic priorities

Fisheries innovation is especially difficult when a Native nation has not done the hard work of determining its long-term vision for the future and identifying where fisheries fit into the vision. Doing that strategic work endows fisheries management with the base of governmental and community support necessary to craft and implement innovations that can require considerable commitments of the nation's human and financial resources.

118. The policy recommendations provided here were developed in part from discussions with Mary Christina Wood (conversation with the author, Feb. 1, 2008).

Be prepared and adaptable

Nations are wise to identify current and impending threats to their fisheries, the geographic scope of necessary management, the various interested players and their incentives, the legal and political instruments the nation has at its disposal to induce those players to collaborate, and the potential tools and parameters for collaboration. Just as important, the nation should anticipate the obstacles that might arise in response to their fisheries-management aspirations and develop contingency plans to overcome them.

Think big picture and long term

Based on its priorities and situational assessment, a Native nation should methodically develop ecosystem-based rehabilitation and management plans for fisheries that explicitly identify its long-term objectives and map out the legal and institutional steps—as well as the human and financial resources—necessary to achieve them.

Build strength in numbers

When and where it advances its strategic priorities for fisheries, a Native nation should join with its fellow nations to maximize its political voice, resources, and, in turn, its practical decision-making capacity.

Move beyond old antagonisms and collaborate

Although easier said than done, the complex jurisdictional maze a Native nation must navigate in the fisheries arena typically demands that it work to transcend differences with adversarial interests to advance and sustain ecosystem-based management priorities. In so doing, it must think strategically about what it is willing to compromise—and what it isn't—as it builds relationships of mutual benefit.



Family swimming at Red Lake. Courtesy of Red Lake DNR.

Build power through knowledge

A Native nation should invest fully in institutional, technical, and human capacity-building with an eye toward becoming the management leader. Ultimately, it should work toward the day when other management players and the courts defer to it as the preeminent authority on the state of the fishery and how best to manage it. Cultivating and retaining expert staff capable of fostering cutting-edge scientific innovations for long-term fisheries sustainability is central to this effort.

Conclusion

Across North America, Native nations that aggressively and strategically work to break free from the shackles of colonialism; forge a national understanding of and support for what they are trying to accomplish; demonstrate a willingness and ability to overcome long-standing antagonism to collaborate with non-Indigenous governments and other stakeholders; invest fully in institutional, technical, and human capacity-building; and make a conscious effort to understand and respond to multiple impacts and outcomes (cultural, economic, and ecological) position themselves to innovate successfully over time in the realm of fisheries management and restoration. In many instances, Native nations that demonstrate capable, competent management and the ability to formulate, institute, and sustain innovations regain practical rights to access and manage fisheries and fish resources in ways that have long been denied them. In so doing, they emerge as global leaders in the future struggle against threats to fisheries sustainability. Finally, they offer other Indigenous nations and peoples throughout the world valuable models that inform effective, self-determined action, not only in the realm of fisheries but in all aspects of Indigenous self-determination and self-governance.

Acronyms

BIA	Bureau of Indian Affairs
CMTs	culturally modified trees
CRITFC	Columbia River Inter-Tribal Fish Commission
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
DFO	Department of Fisheries and Oceans (Canada)
DNR	Department of Natural Resources
EPA/DOI	U.S. Environmental Protection Agency/ Department of Interior
GLIFWC	Great Lakes Indian Fish and Wildlife Commission
HPAIED	Harvard Project on American Indian Economic Development
MOA	memorandum of agreement
MOU	memorandum of understanding
NNI	The Native Nations Institute for Leadership, Management, and Policy
NWIFC	Northwest Indian Fisheries Commission
RLFA	Red Lake Fisheries Association
TIP	Turn In Poachers (Red Lake)
UA	The University of Arizona
UWA	Unified Water Assessment (YRITWC)
YRITWC	Yukon River Inter-Tribal Watershed Council

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Appendix A

YRITWC Accord Signatory Villages, October 2008*

- | | |
|--|---|
| 1. Alakanuk Traditional Council | 34. Louden Tribal Council |
| 2. Alatna Village Council | 35. Manley Village Council |
| 3. Algaaciq Tribal Government | 36. Marshall Traditional Council |
| 4. Allakaket Traditional Council | 37. Mentasta Village Council |
| 5. Anvik Tribal Council | 38. Na-cho Nyak Dun First Nation |
| 6. Arctic Village Council | 39. Naqsrarmiut Tribal Council |
| 7. Asa'carsarmiut Tribal Council | 40. Native Village of Bill Moore's Slough |
| 8. Beaver Tribal Council | 41. Native Village of Minto |
| 9. Birch Creek Tribal Council | 42. Native Village of Shaktoolik |
| 10. Canyon Village Council | 43. Native Village of St. Michael |
| 11. Carcross/Tagish First Nation | 44. Native Village of Tanacross |
| 12. Chalkyitsik Village Council | 45. Native Village of Venetie Tribal Government |
| 13. Chevak Native Village | 46. Nenana Native Council |
| 14. Chuloonawick Native Village | 47. Nulato Tribal Council |
| 15. Circle Village Council | 48. Ohogamiut Traditional Council |
| 16. Eagle Traditional Council | 49. Paimiut Traditional Council |
| 17. Emmonak Traditional Council | 50. Pilot Station Tribal Council |
| 18. Evansville Tribal Council | 51. Pitka's Point Traditional Council |
| 19. Grayling IRA Council | 52. Ruby Tribal Council |
| 20. Gwichyaa Zhee Gwich'in Tribal Government | 53. Scammon Bay Traditional Council |
| 21. Hamilton Tribal Council | 54. Selkirk First Nation |
| 22. Holy Cross Traditional Council | 55. Shageluk IRA Council |
| 23. Hooper Bay Native Village | 56. Stebbins Community Association |
| 24. Hughes Village Council | 57. Stevens Village Council |
| 25. Huslia Tribal Council | 58. Ta'an Kwach'an First Nation |
| 26. Iqurmiut Tribal Council | 59. Taku River Tlingit First Nation |
| 27. Kaltag Tribal Council | 60. Tanana Tribal Council |
| 28. Kluane First Nation | 61. Teslin Tlingit First Nation |
| 29. Kotlik Traditional Council | 62. Tr'on Dek Hwech'in First Nation |
| 30. Koyukuk Tribal Council | 63. Venetie Village Council |
| 31. Kwanlin Dun First Nation | 64. Vuntut Gwichin First Nation |
| 32. Liard First Nation | 65. White River First Nation |
| 33. Little Salmon/Carmacks First Nation | 66. Yupiit of Andreafski |

* Note that, in some cases, multiple signatory groups exist in the same location. This is reflected in Figure 1, the Yukon River watershed map.

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