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Lessons from the Columbia River Basin: Follow the Blueprint but Avoid the Barriers

*Daniel J. Rohlf**

ABSTRACT

Often touted as one of the most ambitious and expensive ecosystem restoration projects in the United States, efforts to restore salmon and steelhead to their habitat in the Columbia River Basin offer a number of useful lessons for other large-scale attempts to restore degraded freshwater ecosystems. Results within the Columbia watershed present a decidedly mixed bag. On one hand, charismatic and culturally important focal species combined with strong legal mandates have pushed salmon and ecosystem recovery efforts to the top of the Northwest's environmental agenda. On the other hand, bureaucratic inertia, powerful resource users with a stake in maintaining the status quo, and weak policy goals have combined to stifle bold reforms and restoration measures. Using the Columbia Basin's blueprint for building conservation momentum, while avoiding its barriers to action, may lead to greater successes in restoration of aquatic ecosystems.

I. INTRODUCTION

The aquatic resources of the Columbia River Basin have helped meet human needs in the Northwest for thousands of years. Since Lewis and Clark's historic journey two centuries ago, however, society has modified the river ecosystem in order to increase its capacity to provide the goods and services necessary to supply the demands of a growing population. Throughout much of the time period covering this headlong rush to "develop" the region's water resources, the workings of the basin's ecosystem were largely unknown, and the human impacts on these natural processes went mostly unheeded. Salmon and steelhead, the river's ecological keystone and river peoples' cultural touchstone, were in many cases spared merely as an afterthought. Even as scientific knowledge made evident many of the changes in the river ecosystem, modern society's confidence in its technical prowess to mitigate environmental changes forestalled any serious accounting of the price of progress.

Time and hard experience gave pause to the Northwest's era of utilization and optimism. The Snake River, the Columbia's major tributary and an impressive waterway in its own right, completely dries up during the summer in some places. Water quality fell as river temperatures rise. The Columbia itself,

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which once raged over 109 major falls and rapids, now runs free in only two places: one in the United States and one in Canada. Scores of dams provide inexpensive hydroelectricity and make Lewiston, Idaho—hundreds of miles from tidewater—a seaport. These same structures block or impede passage of anadromous fish. The so-called “June hogs”—salmon tipping the scales at as much as 100 pounds—no longer make their annual journey upriver to spawn in Canada because their journey is forever cut off by Grand Coulee Dam, one of the largest concrete structures in the world. The basin’s salmon and steelhead runs, once famous for their abundance, are now noted for their appearance on the federal list of threatened and endangered species.

The Northwest began to give serious thought to restoring at least some of the Columbia Basin’s natural characteristics during the latter portion of the 1970s—at about the same time the federal government completed the last major main stem dams on the Snake River. During the past two-and-a-half decades, efforts to restore salmon and steelhead runs in the Columbia and its tributaries have steadily increased, as public and legislative calls for a new outlook toward the river and its ecosystem have mounted. Activities carried out by federal agencies, states, Indian tribes, and even private landowners have resulted in substantial progress towards restoration, but achievement of a functional ecosystem in the Columbia Basin still faces many technical, legal, and social obstacles.

While the jury is still out as to the eventual success of restoration efforts in the Columbia Basin, the Northwest’s drive to revitalize the river’s ecosystem processes and fishery contain valuable lessons for both domestic and transboundary attempts at aquatic restoration. This article begins by discussing some of the significant innovations that have led to progress toward improving the River of the West. It then sounds a cautionary note for other programs by examining some of the barriers to success in the Columbia Basin.

In the end, perhaps the major lesson from the Columbia Basin is that attempts to restore any ecosystem requires a society to do nothing less than rethink and reorder its relationship with the natural world. This is a tall order anywhere.

II. STEPS TOWARD SUCCESS: HOW TO MAKE PROGRESS IN RESTORATION

Work towards improving the aquatic ecosystem of the nation’s fourth largest river system has spanned time, international boundaries, economic and institutional barriers, old animosities and new alliances, jurisdictions almost too numerous to count, vast increases in scientific knowledge and sophistication, and sea changes in public attitudes toward the environment. It is difficult to distill a recipe for success from such a dynamic progression. Nevertheless, the following list attempts to capture from the Columbia experience a few suggestions for steps that other aquatic restoration programs would do well to emulate.

A. Gain a High Degree of Public Interest, Visibility, and Relevance

A glance at a Northwest newspaper on any given day nearly always leads one's eye to a story that touches on the Columbia River and its resources. Though issues related to the environment barely made a ripple at the national level in the 2004 elections, ecosystem restoration efforts are topics of public discussion and every day conversation in both cities and rural areas across the Columbia Basin. This largely stems from the fact that the river's keystone species are also an integral part of the region's culture and identity. Salmon and steelhead are many things to many people: they are at the heart of indigenous culture; provide food for the table; are the staple of recreational pursuits; inject, directly or indirectly, millions of dollars into the regional economy; and finally, are a source of wonder, inspiration, and—not insignificantly—publicity.

While some people were aware of the region's salmon runs' dramatic slide toward oblivion prior to 1990, formal requests that year to list salmon as endangered or threatened under the Federal Endangered Species Act ("ESA") had a dramatic effect on the public. To most, it was almost unthinkable that the region's icon was in serious danger of disappearing altogether. Since these listing petitions were filed—and some dozen separate runs added to the ESA's protected rolls—efforts to restore salmon runs in the basin have played out over a backdrop of high public visibility and concern.

It is largely a function of salmon's status as a regional symbol that the fishes' struggle for a future has captured the attention of the press and public; the contrast with spotted owls' relative infamy is noteworthy. Nevertheless, with salmon as an attention-grabber and unifying theme, the public has been able to much more readily understand (if perhaps simplistically) the issues and tradeoffs involved in basin restoration efforts. For example, dams kill salmon, but produce inexpensive electrical power; following figuratively along with the fish on their journey to the sea thus quickly leads interested observers to a main cause of ecosystem disruption, and also reminds people of the tradeoffs involved in improving river conditions for salmon. This attention to and understanding of the plight of fish in the Columbia Basin has proven fortuitous for conservation work. Ecosystem restoration requires sustained efforts in terms of both time and resources, a drive that is often only possible when a challenge plays out in the public eye. Keen public interest in attempts to reverse the decline of Columbia salmon and their ecosystem thus has played an important role in galvanizing restoration actions.

Of course, not every aquatic ecosystem is blessed with such a charismatic poster child. However, the Columbia experience provides a reminder that the public needs a cause with which it can easily identify; ecosystem restoration for its own sake, or for perfectly valid reasons that are more cerebral and scientific than instinctual or cultural may not hold public attention long enough to sustain needed and frustratingly gradual ecosystem rebuilding. Proponents of restoration also need a mechanism to explain tradeoffs in a manner that resonates with the

person on the street—in effect, how does this conservation program matter to *me* and affect what *I* care about?

B. Develop a Longstanding Legal Commitment to Restoration

In addition to providing a focal point for public attention, a flagship species or resource can also drive legislative and legal approaches to restoration. A legal promise to protect salmon fishing served as the very foundation for white settlement of the Northwest. In 1855, the U.S. government pledged in treaties with the region's Indian tribes that the tribes would forever have access to this crucial part of their culture and economy. These agreements, along with the federal government's trust responsibilities to the tribes, still serve as a primary legal force behind efforts to restore these runs and their river habitat.

Even in the 1930s, Congress recognized that dams built to develop and reclaim the West were having devastating impacts on the region's aquatic environments. In the Fish and Wildlife Coordination Act, lawmakers required that the Federal Bureau of Reclamation and U.S. Army Corps of Engineers consult with biological experts, and consider ways to minimize the impacts of water resource development on fish and wildlife resources. Though it virtually has no substantive bite, the Fish and Wildlife Coordination Act played an important role, particularly early on, in injecting biology into the decision-making processes controlling the Columbia's resources, as well as served as an important vehicle for allowing the U.S. Fish and Wildlife Service to provide input into basin restoration efforts.

By 1980, however, it became apparent that legal obligations to the tribes and consultation with biological experts had not been sufficient to prevent substantial declines in salmon populations. This realization prompted Congress to include in regional energy legislation a mandate that federal hydropower managers not merely *consider* the needs of fish and wildlife, but provide biological resources such that the needs of fish and wildlife receive equitable *treatment* on par with other purposes of development in the Columbia Basin. This legislative milestone also served as the basis for regional coordination and input into resource management decisions on the Columbia.

After another decade, however, the continued slide of Columbia River salmon populations gave testament to the fact that even this innovative regional framework had largely failed to make significant progress toward restoring the vitality of the Columbia ecosystem. The petitions to list salmon under the ESA enlisted in restoration efforts a statute termed by commentators as the "pit bull of environmental laws." The ESA perhaps had—and continues to have—the most significant impact on ecosystem restoration.

Ecosystem restoration in the Columbia Basin has advanced in many ways to its current state due to the long history of pro-restoration legal mandates. Many restoration efforts across the country often try to short-circuit this gradual legal progress by invoking the ESA. While this strategy can prove effective, it is an

increasingly uncertain path: the ESA's effectiveness made the statute itself vulnerable to those whose stakes are tied more to the status quo than to restoration. Lawmakers and various economic interests, increasingly weary of the ESA's ability to quickly change the legal landscape, are pushing to modify and weaken the law itself.

C. Foster Strong Regional Involvement of All Significant Parties, and Crafting Mechanisms for Interjurisdictional Coordination and Communication

Fractured lines of communication and the difficulties of interagency cooperation are traditional barriers to ecosystem restoration. In the Columbia Basin, however, longstanding restoration efforts and the unique structure of regional legislation allowed the region to overcome some of these barriers. For example, the Northwest Power Act of 1980 created a regional body that is now known as the Northwest Power and Conservation Council ("Council") to serve as a forum for planning and discussing programs to restore and protect fish and wildlife in the Columbia Basin. Through state-appointed representatives, each of the four basin states (Oregon, Washington, Idaho, and Montana) plays an equal role in the Council's deliberations and actions. Though some of the Council's decisions regarding federal management and system operations merely have persuasive force rather than carry the weight of legal mandates, this unique interstate compact body also controls expenditures of substantial federal funds for projects that directly affect habitat and ecosystem restoration. The Council also serves as a sort of regional forum for formulating and publicizing new restoration ideas, approaches, and goals.

The federal courts even serve as a forum for a sort of regional cooperation in basin resource management. For decades, a federal judge in Portland served as a mediator, facilitator, and at times, a dictator, regarding issues dealing with allocation of the basin's fishery. Under the auspices of the case known as *United States v. Oregon*, a federal judge oversees management of salmon and steelhead harvest decisions. The region's various governmental actors, including tribes with treaty fishing rights, are thus literally forced to communicate and coordinate with one another on allocation issues, a process that ultimately produces decisions that tend to be based more on consensus rather than conflict.

Federal hydrosystem managers also developed a means to encourage interagency and intergovernmental communication and cooperation in making hydrosystem management decisions. The Columbia River Regional Implementation Forum includes representatives of state fish and wildlife agencies, basin tribes, and a number of federal agencies, including the Corps of Engineers, Bonneville Power Administration, Bureau of Reclamation, Environmental Protection Agency, and federal land management agencies. This body operates by consensus—which effectively means that federal hydropower managers have the final word on the substance of decisions—but it plays an important role in providing other interested agencies and even the public with information about system operations, as well as an

opportunity to provide technical information, ideas, and input to federal decision makers.

Finally, in perhaps the most ambitious attempt at coordinating federal and local restoration efforts, the National Marine Fisheries Service (“NMFS”) began in the late 1990s to use its authority under the ESA to encourage states and local jurisdictions to develop their own approaches to regulating activities that threatened salmon and their habitat. Based on a set of guiding principles formulated by the federal agency, states and local regulators draft their own regulatory approaches to salmon restoration. If approved by the NMFS, the agency effectively writes these local regulations into federal law through section 4(d) of the ESA. In doing so, the NMFS provides certainty for regulators and other entities alike by guaranteeing that actions in compliance with approved local regulations in turn comply with the strictures of the ESA. The NMFS intended that this program would encourage other government entities to participate in designing legal mechanisms to restore salmon and their ecosystem, and perhaps more significantly, to use state and local enforcement mechanisms to ensure that restoration actually takes place.

D. Create Avenues for Public Participation in Both Policy Processes and Dispute Resolution

Public participation in decision-making helped to encourage restoration activities in the Columbia Basin. Procedural mechanisms of federal statutes, such as public involvement requirements of NEPA, the Northwest Power Act, and ESA, played the most important role in providing opportunities for the public and interested organizations to gain information, and to provide input to federal managers and policymakers. Though this is hardly unique, the high-profile nature of salmon and habitat restoration efforts in the region has in some instances encouraged federal agencies and the Council to go beyond the letter of the law in providing chances for the public to have a say in important policies. For example, section 7 of the ESA does not require the federal government to seek public comment on draft biological opinions that discuss proposals’ anticipated impacts on protected fish. However, the NMFS sought and responded to comments from all interested parties in the process of crafting its two most recent biological opinions dealing with proposed hydrosystem operations.

Citizen suit provisions of federal law have also enabled a wide variety of interests to influence—and sometimes alter dramatically—the direction of restoration efforts. Federal court decisions in cases brought by fishing organizations, environmental groups, and Indian tribes have set the stage for additional restoration efforts within the basin, including conservation actions required under court-ordered injunctions. The ability to make effective use of these legal enforcement opportunities to restore the basin’s fishery also resulted in some interesting alliances among disparate interests. For example, tribal fishers on one hand and commercial and recreational fishers on the other often

were at odds in the past, sometimes to the point of literally shooting at one another. Though tensions between these groups still sometimes surface, in the past decade they have more often found themselves on the same side in federal lawsuits seeking to improve ecosystem conditions for fish.

E. Institutionalize a Commitment to Scientific Involvement in the Restoration Process

Science always plays a key role in ecosystem restoration efforts, though unfortunately many such programs only developed ad hoc systems to integrate technical considerations with law and policy. In the Columbia Basin, however, agency practice and federal law combined to develop ways to systematically integrate science into restoration and decision-making frameworks. On an informal basis, the Council created panels of independent scientific experts to provide the body with advice on restoration strategies. Congress later integrated this idea into the fabric of the Northwest Power Act. Under this requirement, an independent science panel must review proposals for improving fish and wildlife populations in the basin before any projects are eligible for federal dollars. Another standing panel operated by the Council, the Independent Scientific Advisory Board, now provides general scientific advice on ecosystem restoration.

At times, federal agencies also formed interagency technical advisory committees to pull together the most up-to-date scientific information to assist with restoration programs. For instance, the NMFS sponsored a panel of state, federal, and tribal biologists in the late 1990s that developed useful information on dams' impacts on salmon. The agency also formed technical advisory teams of outside experts to assist in establishing biological goals for salmon recovery plans.

Finally, the ESA's provisions dealing with science also played an important role in the Columbia. The statute mandates that federal agencies use the best science available in making decisions about threatened and endangered species. This requirement encourages federal agencies to reach out to other sovereigns and outside experts for scientific information important to decision-making. This standard also provides a measuring stick that federal courts have applied in reviewing agency decisions.

F. Create Guiding Visions

Ecosystem restoration programs have little chance for eventual success without a clear definition of what constitutes a successful outcome, as well as a guiding vision for the process needed to achieve these results. Straightforward expressions of these goals and visions have helped direct ecosystem restoration in the Columbia Basin.

By recognizing the importance of the fishery for cultural, recreational, and commercial purposes, the region developed a consensus that the ultimate goal of aquatic restoration in the basin is harvestable salmon and steelhead populations. This sets an ambitious agenda, particularly for weak stocks protected under the ESA. Significantly, this high bar for success likely exceeds the minimum legal requirements under the ESA, which have been criticized as a “museum piece” approach to restoration. It also has power as a result of its simple, easily understood formula that connects human-centered as well as biological goals.

Even more difficult than setting goals, however, is describing a conceptual foundation for progressing toward those goals. Nearly a decade ago, a science advisory panel assembled by the Council articulated the concept of a “normative river,” which eloquently described both a social and biological framework for restoration in the basin:

[T]reat the Columbia River and its tributaries as both a natural *and* a cultural system. A natural-cultural ecosystem encompasses all the ecological and social processes that link organisms, including humans, with their environments. This approach integrates the habitat of salmon and other wildlife, as well as human habitat, with land use and other cultural developments.

The normative ecosystem is not a static target or a single unique state of the river. It is a continuum of conditions, from slightly better than the current state of the river at one end of the continuum, to nearly pristine at the other end. Through its policy representatives, the region will have to decide, based on its economic, cultural, and ecological values, how far it will move the river along the normative continuum

This vision of the path toward restoration of the Columbia ecosystem not only describes a path toward recovery of the river and its resource, but also put its finger on the central social challenge with which the Northwest is still wrestling today: how much of the historic river, its ecosystem, and its fish do our modern-day values demand?

III. CAUTIONARY TALES FROM THE COLUMBIA: PITFALLS TO AVOID

Despite the notable achievements of efforts to restore the Columbia River ecosystem and its flagship species, one fact is inescapable: no salmon stock or other protected aquatic species has recovered to the extent that allows its removal from the endangered or threatened lists. While this is due in part to the fact that ecosystem restoration necessitates considerable time to achieve success, agency missteps, political infighting among the region’s disparate interests, limited resources and scientific expertise, and bureaucratic roadblocks also slowed progress toward ultimate success. These problems hold too valuable lessons for other broad-scale restoration programs.

A. *Do Not Allow Restoration Efforts to Fragment*

Though federal managers and state political leaders usually speak in broad terms of ecosystem restoration throughout the Columbia Basin, in reality many familiar problems have hampered implementation of a comprehensive conservation strategy. Political jurisdictions at odds with biological boundaries, simplistic approaches that relegate complex problems into convenient human-created categories, and temporal gaps in implementing needed reforms have often slowed restoration progress.

Entities responsible for managing and restoring the Columbia Basin—which encompasses an area roughly the size of France—have not met with complete success in working across political, jurisdictional, and conceptual boundaries. Parochial interests of political subdivisions within the basin sometimes trump overall ecosystem restoration efforts. Canada, for example, as well as local governments and tribes from the upper portion of the basin, often oppose releases of stored water in reservoirs to augment spring and summer river flows, and thus improve migration conditions for salmon and steelhead. These sentiments are predictable, however, since dams now block migrating salmon from reaching the upper portions of their former range—and thus from providing any economic, cultural, and other benefits to the communities in these areas. In this sense, biological fragmentation of the river ecosystem contributed to the political fragmentation of attempts at ecosystem restoration.

Conceptual balkanization of the problems facing the Columbia and its tributaries also slowed the river's recovery. Facilitated by a federal regulatory scheme that divides problems into entirely separate thematic categories—and ironically furthered by attention to the regional icon that has done so much to galvanize attention to the ecosystem's problems—the region tends to look at basin restoration efforts as primarily a mandate of the ESA to save salmon and steelhead. In doing so, it sometimes overlooks key parts of the puzzle. For instance, federal agencies, as well as the states, put little emphasis on efforts to improve water quality in the basin, at one point even arguing (successfully) in court that agency actions to comply with the Clean Water Act were in effect unnecessary in light of the agencies' efforts to comply with the ESA. In fact, ultimate success in Columbia restoration will remain elusive until the region integrates a host of interconnected management reforms to further conservation goals: improved dam operations, more careful public land management, improvements in water quality regulation, efforts to foster irrigation efficiencies and reductions, and an overhaul of the region's hydroelectric-dependant energy marketing and pricing structure to better account for the ecosystem's limitations on energy production.

Finally, problems of “temporal fragmentation” also rendered the Northwest's drive to restore the Columbia ecosystem less effective. In three separate comprehensive salmon conservation plans over the past decade, the NMFS called for bold steps to improve fish survival. Each time, however, there was a

significant catch: implementation of some of the most far-reaching strategies and projects that ranged from in-stream flow protections to expensive dam retrofits and potentially to dam removal was put off by the agency to some (often indeterminate) future time. Not surprisingly, this procrastination led to little actual implementation—and a corresponding lack of progress toward completion of restoration.

B. Foster Close Connections Between Planning And on-the-Ground Actions

The Columbia Basin's aquatic ecosystem is well on its way to recovery in at least the many outstanding plans for remedial action written by a wide variety of regulators and other public entities. Unfortunately, well-crafted visions and sensible actions that are included within these plans too often stay within the confines of pages and volumes occupying shelf space in various offices and libraries.

The Council, for example, led at least two high-profile restoration planning efforts in recent years. The Council's Fish and Wildlife Program, required by the Federal Northwest Power Act, sets forth goals and actions designed to reverse losses to biodiversity and ecosystem function caused by construction of the basin's hydroelectric system. While the program has generally succeeded in shaping annual expenditures of available funding from the Bonneville Power Administration, the program's impact on long-term restoration efforts is decidedly more mixed, thanks in large part to the Council's sometimes reluctance to adopt measures that venture far from the status quo, as well as federal hydropower managers' insistence that federal agencies have no enforceable legal obligation to actually implement the program. Under the umbrella of its Fish and Wildlife Program, the Council also went through a lengthy—and expensive—public process to prepare restoration and management plans for thirty-six sub-basins throughout the greater Columbia system. The resultant plans are long on vision, biological objectives, and broad recommendations—for example, the plan for the Willamette sub-basin simply calls for the region to “deal with” the many dams on Willamette tributaries that pose barriers to salmon and steelhead runs—but short on specifics, funding, and enforceable standards. As a consequence, many of these plans are likely to have their greatest impact as part of citation lists and bibliographies, rather than as catalysts for on-the-ground actions.

The NMFS has for years carried out its own planning efforts for restoring the Columbia Basin's anadromous fish. The ESA directs the agency to prepare recovery plans for the dozen listed species throughout the basin. With the assistance of various stakeholder groups, technical advisory committees, and public comment, drafting these plans has occupied the NMFS for a decade, though not a single one has received final agency approval. Although NMFS' recovery and planning process and sub-basin planning process cover the same area and species as the Council's Fish and Wildlife Program, there are few if any explicit links between the two. Moreover, if and when the NMFS completes its

plans, they are highly unlikely to wield substantial influence over real-world activities, at least under current law and agency interpretation. The ESA's mandate to actually implement steps outlined in recovery plans is notoriously soft, and neither the NMFS nor the U.S. Fish and Wildlife Service has ever showed an inclination to make extensive use of recovery plans in implementing the ESA's substantive protections for listed species.

The drawbacks of extensive planning and minimal implementation are readily apparent. Comprehensive planning processes demand substantial expenditures of agencies' financial and personnel resources that could otherwise be spent on restoration actions. Additionally, plans often quickly become outdated. Perhaps most insidiously, planning efforts draw heavily upon the limited reservoir of institutional capacity and public will for dealing with restoration challenges; if these precious assets go toward producing dormant documents rather than galvanizing action, recovery efforts will correspondingly suffer.

C. Do Not Allow Science Processes to be Co-opted

Though science has played an important and productive role in shaping Columbia restoration programs, its power in providing a rationale to change the status quo has sometimes led to efforts to co-opt science processes. For example, while a team of experts assembled by the Council called for a "normative" river that more closely approximated natural flow conditions, economic interests opposed to greater spring and summer releases of water stored behind the region's dams sought to cast doubts on this strategy. These interests called for a series of studies that ask whether more flows really help fish. By framing the question in these studies as "does available data indicate that more reservoir releases increase fish survival?" these investigations can subtly shift the burden of scientific uncertainty—which is found in abundance surrounding Columbia restoration—toward a posture that favors inaction. Any equivocal results of these studies are used to justify abandoning efforts to restore a more natural river hydrograph.

The NMFS also landed in the midst of substantial controversy when it modified its approach to restoration science. In its most recent ESA biological opinion examining operations of main stem federal dams in the Columbia and Snake Rivers that was completed in November 2004, the NMFS dramatically altered its scientific framework for assessing impacts on listed species. Among other changes, the agency assumed that many impacts of the dam operations were simply due to the fact of the structures' existence. Since federal agencies are not authorized to remove the dams, the NMFS decided that it could virtually ignore many of their adverse impacts on salmon as simply part of the basin's "environmental baseline." Employing this new scientific methodology, the NMFS concluded—for the first time in a decade—that operations of the dams as proposed by federal hydropower managers would not jeopardize the continued existence of listed salmon and steelhead runs, obviating the need for further

modifications in dam operations to lessen impacts on the fish. A later federal district court overturned NMFS' conclusions, and ordered federal hydropower managers to take additional actions to improve salmon survival.

As science plays a larger role in guiding restoration, there inevitably will be attempts to frame scientific questions in a manner that supports a favored policy outcome, or attempts to manipulate the science itself to reach pre-ordained conclusions. One long-time advocate for salmon restoration calls this phenomenon "torturing the data until it confesses what the powers-that-be want to hear." Restoration programs should anticipate this tendency, and put safeguards in place against attempts to manipulate science. Tools, such as independent scientific advisory boards, which have helped the Council avoid some of the controversies over science that have dogged other programs in the Columbia, and similar means of increasing objectivity and openness in science processes can help insure that science facilitates making transparent and informed policy choices rather than serves as a screen for rationalizing hidden policy agendas.

D. Beware of Attempts to "Kill the Messenger"

Though high-profile, charismatic species and powerful, prescriptive legal mandates can be key factors in pushing forward ecosystem restoration, interests opposed to those efforts may eventually mount campaigns to oppose even popular species and laws. In the Northwest, some industries dependent on traditional water resource uses and occasional editorial commentators openly muse whether conservation of salmon and steelhead is worthwhile in a river system that has largely been converted to further economic uses unrelated to its biological resources. A former Idaho Congresswoman once famously wondered, why incur extensive costs and economic dislocations to recover threatened and endangered salmon, when one can still buy salmon at the grocery store?

Several Northwest politicians also took aim at the primary legal underpinning of the Columbia Basin restoration program, becoming prominent critics of the ESA. Members of Congress from the region supported legislative attempts to weaken the ESA, as well as threatened to overturn court decisions won by conservation groups and Indian tribes through riders to federal spending bills.

Thus far, both popular and legislative attempts to undermine public and legal support for Columbia Basin ecosystem recovery measures have met with little success. However, maintaining a focus on restoring the Columbia and its biodiversity has required vigilance at many levels on the part of restoration proponents, who have mounted large-scale public relations campaigns, and had a continual presence in Washington D.C. and other centers of political influence. These efforts are currently integral components of restoration strategies.

IV. CONCLUSION

Some have characterized attempts to restore salmon and steelhead runs, and the aquatic ecosystem they inhabit, as the most ambitious and costly ecosystem recovery effort in the United States. Whether this label is literally true is unimportant. There is no doubt that restoration activities in the Columbia Basin are complex, costly, and controversial; and that conservation efforts have made important strides toward returning the basin's biological resources to levels commensurate with their ecological, cultural, and economic importance to the Northwest. The region's experiences with attempts at ecosystem restoration on a large scale offer many lessons (and cautions) for other such undertakings.

In general, the Columbia's lessons are straightforward: a high degree of public visibility and interest anchored by a regional icon, strong legal mandates, and opportunities for involvement by the public, relevant stakeholders, and the scientific community form the basis for significant progress in restoration programs. These characteristics are subject to backlash, however, with proponents of maintaining the status quo sometimes seeking to attack the laws that drive restoration, or the very objectives of restoration. More insidiously, those who see themselves as suffering as a result of ecosystem recovery programs may endeavor to influence or co-opt the scientific rationales that underpin these programs, and agencies tasked with implementing recovery measures can get bogged down in planning efforts that produce few tangible results.

In the end, ecosystem recovery efforts will succeed when—and only when—the majority of people and institutions in a region see this action as in their best interests. Even in the Columbia Basin, the jury may still be out.

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