SALMON PROTECTION IN THE PACIFIC NORTHWEST: CAN IT SUCCEED?

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INTRODUCTION

Many environmental issues are complex, and few are more complex than the issue of salmon protection. From the public policy perspective, a major problem is the limits imposed by nature. Another is the appropriate jurisdictional levels for intervention, and the balance between public and private participation in the process. Water is always political, and the salmon issue illustrates this in spades. The number of stakeholders is large, and the trade-offs between protection and economic costs are difficult. In this paper, two case studies relating to salmon are examined (and a third, about the Sacramento River problem and its consequences, is mentioned briefly). The first is the relationship between the Endangered Species Act and Washington State's Growth Management Act,[1] an example of the classic struggle between protecting the environment and accommodating urban development. The second is the Klamath River issue, an epic story of conflict among farmers, fishermen, Native American tribes, environmentalists, a major multinational corporation, and many levels of government. It is also a problem that may not have a solution, in part because it is not only about salmon protection but also about water allocations.

In the case of any threatened species such as the Pacific Northwest salmon, one of the main concerns is their long-run status. Although the current salmon stocks are low and fluctuate considerably from year to year, it has been argued that the *species* will neither disappear nor be substantially replenished, even in the long run.[2] Other than the influence of natural forces beyond human

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1 WASH. REV. CODE § 36.70A.010 (2008).

2 Robert T. Lackey, *Pacific Northwest Salmon: Forecasting Their Status in*

control, restoration would require very strong policies that have high economic costs, substantial social dislocation in some situations, and would nevertheless have a low probability of success. While many are favorable to the idea of salmon restoration there is not wide enough public support for the tough measures required.

The key policies to promote salmon recovery are often summarized as the four Hs: habitat damage recovery, harvesting policies, hatchery practices, and hydroelectric dams. Most of these are self evident. Habitat damage permeates the discussions in this paper, and refers to all environmental damages that affect waterways in which salmon swim. Harvesting policies mean the prevention of over-fishing. Hatchery practices imply rearing juvenile fish prior to release and/or holding fish throughout their life spans to ensure stock survival. The release option is often coupled with mass tagging programs to track the contribution of hatchery fish relative to wild fish in maintaining the stock. A case concerning the problem of hydroelectric dams is discussed later.

If long-term restoration is improbable, this reflects the net effect of several societal forces: the pressure of rapid population growth on natural resources; competing, often mutually exclusive, priorities; *claimed* support for restoration, but unwillingness to pay the high costs involved for strategies that might fail when faced with the forces of nature; and entrenched and inflexible policy positions, often with bureaucratic support.[3]

There is a major focus in this journal issue on climate change. This topic is very relevant to salmon protection because there is some controversy about the role of climate in salmon depletion and below-average survival rates compared with other potential causes such as urban development, water pollution, overfishing, and more general forms of environmental degradation. There have been many studies on this point.[4] One argument is more general.

2100, 11 REVS. IN FISHERIES SCI. 35, 47, 78 (2003).

[3] Another issue, not addressed in as much depth, is the misuse of science in influencing policy. Scientific "facts" and expert opinion are used for political ends, and policy preferences are based too much on scientific criteria with little reference to values, culture, lifestyles, and economic costs.

[4] *See* Edward L. Miles et al., *Pacific Northwest Regional Assessment: The Impacts of Climate Variability and Climate Change on the Water Resources of the Columbia River Basin*, 36 J. AM. WATER RESOURCES ASS'N 399, 405, 410, 418 (2000) (finding institutional conflicts associated with decreased water supply with climate change). *See also* Philip W. Mote et al., *Preparing for Climate*

Climate change projections suggest very low summer streamflow conditions that will have a continued and significant impact on salmon upstream runs occurring in late summer or early fall. The second argument is more specific. First, to what extent is the problem based on ocean-related rather than land-based factors? Second, are the impacts transient and intermittent because of El Nino weather conditions or are they long-term because of global warming? If the latter, this could be related to either ocean warming or drought conditions.[5]

Salmon protection is an issue that involves all levels of government. Because of its regional significance, it is probably best handled at the state level where resources can be allocated to the problem in serious situations. Lower levels of government primarily have a participatory role, while the federal government's role is necessary in some cases where a waterway or habitat crosses state boundaries.

I. ENDANGERED SPECIES AND GROWTH MANAGEMENT

The Endangered Species Act (ESA) of 1973 aims to protect species that are endangered or threatened.[6] In the Pacific Northwest, this primarily means salmon and trout. Because these species live and breed in both freshwater rivers and streams (as well as in saltwater environments) urban development strongly impacts their habitats.

The two agencies responsible for the implementation of the ESA throughout the United States are the National Oceanic and Atmospheric Administration (NOAA), responsible for marine (saltwater) and anadromous (existing in both saltwater and freshwater) species, and the U.S. Fish and Wildlife Service (responsible for land and freshwater species). The National Marine Fisheries Service (NMFS), a division of NOAA, is the lead federal agency in Washington State with respect to oversight and enforcement of the ESA as it relates to salmon species. Since 1992, NMFS has listed twenty-two separate populations of salmon

Change: The Water, Salmon, and Forests of the Pacific Northwest, 61 CLIMATE CHANGE 45, 81 (2003) (emphasizing the difficulty of quantifying the effects of climate change on the salmon population relative to all the other stresses).

[5] The average regional temperature increased by 0.8 degrees Centigrade in the twentieth century and is expected to increase by a mean 1.5 degrees by the 2020s and 2.3 degrees by the 2040s. *See* Mote et al, *supra* note 4.

[6] Endangered Species Act of 1973, 16 U.S.C. § 1531(b) (2000).

and trout in Washington State as "endangered" or "threatened."[7]

The ESA prohibits the "taking" of any listed species by undertaking certain activities that could lead to the harm, capture, or death of such species and their habitat.[8] The prohibition on the "taking" of salmon through these and other activities applies to private citizens, businesses, and governments. The term "taking" relates to a broad range of activities, including the destruction or modification of habitat of a listed species. Connie Sue Matos Martin, an environmental law attorney, summarizes a number of activities that could *potentially* be considered as "taking" the habitat of salmon, including but not limited to:

i. Land use activities such as urban development, logging, grazing, farming, or road construction;
ii. Destruction or alteration of habitat, such as the removal of large woody debris or riparian shade canopy, dredging, discharge of fill material, and draining, ditching, blocking or altering stream channels or surface or ground water flow;
iii. Blocking fish passage through fills, dams, or impassable culverts;
iv. Pesticide applications; and
v. Water withdrawals in areas where there are important spawning or rearing habitats.[9]

Inevitably, the listing of various salmon species as "threatened" or "endangered" has led to contention between salmon conservation efforts and competing economic interests such as farming and land development. Litigation is a common result. For example, in a 2004 case, the U.S. District Court for the Western District of Washington established buffer zones for certain areas located near salmon-supporting waters and has outlawed certain types of pesticides.[10] Such decisions must be

[7] WASHINGTON STATE GOVERNOR'S SALMON RECOVERY OFFICE, ENDANGERED SPECIES ACT STATUS OF WASHINGTON SALMON, TROUT & STEELHEAD POPULATIONS, http://www.governor.wa.gov/gsro/regions/listings.asp (last visited Oct. 30, 2008).

[8] 16 U.S.C. § 1532(19).

[9] CONNIE SUE MATOS MARTIN, THREATENED SPECIES IN AN URBAN ENVIRONMENT: CHINOOK SALMON AND THE 4(D) RULE (1995), *available at* http://www.djc.com/special/environment2000/scb.html.

[10] *See* Washington Toxics Coalition v. U.S. Envtl. Prot. Agency, 357 F. Supp. 2d 1266 (W.D. Wash. 2004). See also U.S. ENVTL. PROT. AGENCY, COURT ISSUES ORDER IN ENDANGERED SPECIES CASE – WASHINGTON TOXICS COALITION

based on "best available scientific information."[11] The U.S. Environmental Protection Agency (EPA) or the NMFS are responsible for evaluating which pesticides are harmful to salmon species.

NMFS also does not issue specific regulations for local entities, only guidelines of activities that should be avoided in order to prevent a "taking" of a protected species. Therefore, state and local government entities are encouraged to take action to limit their liability for "taking" a protected salmon species by implementing local policies that make such a "taking" unlikely to happen. The NFMS mentions state and local governments, federal agencies, professional associations, and non-governmental organizations as sources of information for best practices that can be useful to creating policies that protect salmon.[12]

Under the ESA, local governments are required to undertake recovery plans for listed species. The NMFS has developed a set of rules that allow local governments to implement conservation plans through a streamlined permitting process and local (state-level) oversight. Such conservation activities are exempt from federal "taking" restrictions if undertaken in consistency with municipal ordinances and plans approved by NMFS. Under these rules, local governments submit conservation plans to NMFS, which NMFS judges based on a long list of criteria. These include whether or not the plan will prevent development from having an adverse impact on the habitat of the listed species. A regional strategy has also been developed (the Shared Strategy for Puget Sound) which addresses conservation planning at the regional scale.[13]

Another exception to the "taking" rule involves municipal, residential, commercial, and industrial development and redevelopment. This allows local governments to develop local regulations that comply with certain ESA requirements that minimize the impact to salmon habitat, such as: avoiding

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V. EPA (2007), *available at* http://www.epa.gov/espp/litstatus/wtc/index.htm (last visited Feb. 4, 2008).

[11] U.S. ENVTL. PROT. AGENCY, *supra* note 10.

[12] NAT'L MARINES FISHERIES SERV. NW. AND SE. REGIONS, A CITIZEN'S GUIDE TO THE 4(D) RULE FOR THREATENED SALMON AND STEELHEAD ON THE WEST COAST (2000), *available at* http://www.nwr.noaa.gov/ESA-Salmon-Regulations-Permits/4d-Rules/upload/4d-Citizens-Guide.pdf.

[13] SHARED STRATEGY FOR PUGET SOUND, http://www.sharedsalmonstrategy.org/ (last visited Oct. 30, 2008).

development on steep slopes or near salmon habitat; protecting natural vegetation; preventing adverse impacts of storm water discharge into habitat areas; and preserving natural river or streams, along with several other considerations. The Washington Growth Management Act (GMA) provides a framework for preventing such development by requiring local governments in Washington to integrate *critical areas ordinances* and *shoreline master plans* into their comprehensive plans.[14] The State also guides local government with non-mandatory *minimum guidelines* for protecting critical areas.[15]

II. STATE AND LOCAL LAWS AND ORDINANCES

The Washington GMA is a very broad piece of legislation, but many of its provisions have repercussions for wildlife habitats, of which that of salmon is by far the State's most important. The GMA requires cities and counties to designate rural undeveloped land as either "resource land" (agriculture, forest, or mineral lands) or "critical areas," which include wetlands, floodplains, "geologically hazardous areas" (e.g., steep slopes), and wildlife habitat conservation areas.[16] Fish and Wildlife Habitat Conservation Areas (HCAs) are not explicitly defined by the GMA, but the Department of Community, Trade and Economic Development (CTED) established non-mandatory minimum guidelines to be used by cities and counties when establishing HCAs. These guidelines include establishing critical areas where there are "endangered, threatened, and sensitive species."[17] Local governments must use the best available science (BAS) to designate these areas and implement environmental regulations.[18]

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[14] WASHINGTON STATE DEP'T OF ECOLOGY, INTRODUCTION TO THE SHORELINE MANAGEMENT ACT, http://www.ecy.wa.gov/programs/sea/sma/st_guide/intro.html (last visited Oct. 30, 2008).

[15] WASHINGTON STATE DEP'T OF COMMUNITY, TRADE, AND ECONOMIC DEVELOPMENT, FISH AND WILDLIFE HABITAT CONSERVATION AREAS, http://www.cted.wa.gov/site/747/default.aspx (last visited Oct. 30, 2008).

[16] TERI GRANGER ET AL., WASH. STATE DEP'T OF ECOLOGY, WETLANDS IN WASHINGTON STATE VOLUME 2: GUIDANCE FOR PROTECTING AND MANAGING WETLANDS at 2-1, 2-5 (2005), *available at* http://www.ecy.wa.gov/pubs/0506008.pdf.

[17] WASH. STATE DEP'T OF CMTY, TRADE AND ECON. DEV., FISH AND WILDLIFE HABITAT CONSERVATION AREAS, http://www.cted.wa.gov/site/747/default.aspx, (last visited Sept. 25, 2008).

[18] *Id.*

Shoreline plans are an older policy instrument included in the Washington State Shoreline Management Act (SMA), adopted in a 1972 referendum.[19] The SMA applies to the thirty-nine counties and more than two hundred cities with shorelines in the State.[20] Shorelines regulated by the SMA include marine (saltwater), freshwater lakes, streams, and rivers, as well as associated wetlands. The relevant counties and cities are required to develop shoreline master plans based on state regulations in the SMA but "tailored to the specific geographic, economic, and environmental needs of the community."[21] The shoreline master plans are comprehensive plans for shoreline areas with specific zoning regulations that must be reviewed and approved by the Washington State Department of Ecology before being implemented.

III. FEDERAL CRITICAL HABITATS

At the federal level, the NMFS can designate "critical habitats," which places restrictions on how federally-funded projects can be built on or near these areas.[22] These critical habitats are distinct from the critical areas designated by cities and counties.[23] The federal critical habitats adopt an "open, public process," involving written comments and public hearings. Also, economic and national security impacts must be considered.[24]

The designation of key habitats for the Chinook in the State (in February 2000) covers all relevant marine, estuarine, and river reaches, in all a large area (more than 3,500 square miles) in Central Puget Sound (King, Kitsap, Pierce, and Snohomish Counties), and the adjacent rural counties (Clallam, Island,

[19] Shoreline Management Act of 1971, WASH. REV. CODE § 90.58.010 (2008).

[20] WASH. STATE DEP'T OF ECOLOGY, SHORELINE MANAGEMENT, http://www.ecy.wa.gov/programs/sea/sma/st_guide/intro.html (last visited Feb. 5, 2008).

[21] *Id.*

[22] NAT'L OCEANIC AND ATMOSPHERIC ADMIN., ESA CRITICAL HABITAT, http://www.nwr.noaa.gov/Salmon%2DHabitat/Critical%2DHabitat/ (last visited Oct. 30, 2008).

[23] WASH. REV. CODE § 36.70A.060 (2008).

[24] NAT'L OCEANIC AND ATMOSPHERIC ADMIN. FISHERIES, CRITICAL HABITAT, http://www.nmfs.noaa.gov/pr/species/criticalhabitat.htm (last visited Oct. 30, 2008).

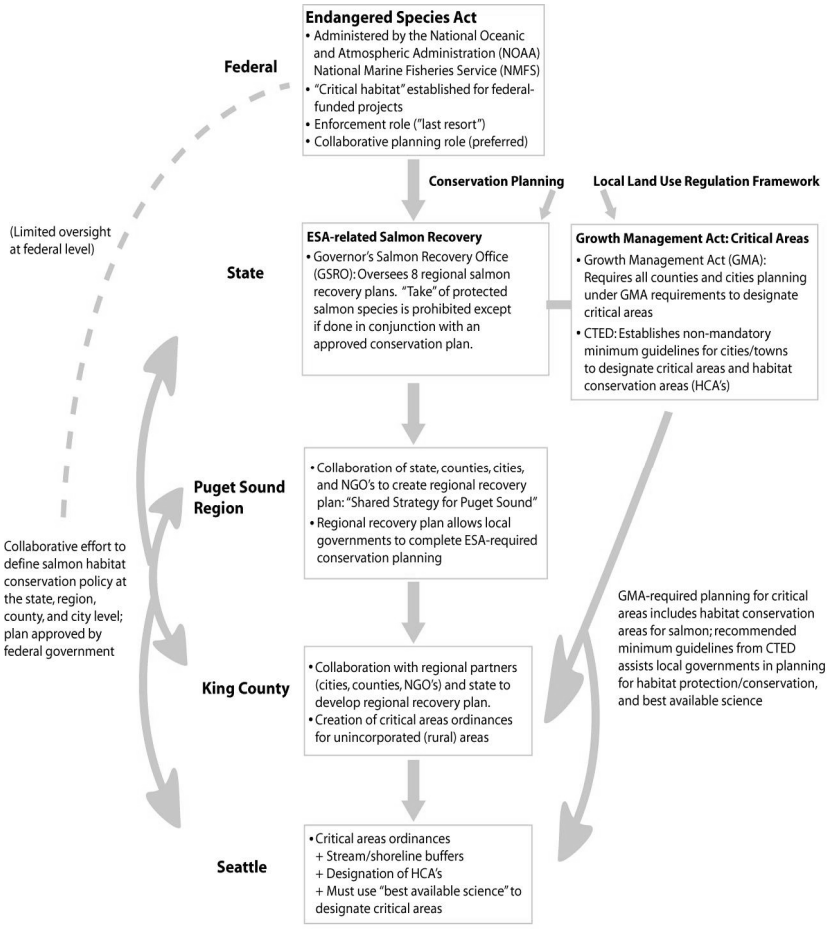
Jefferson, Mason, San Juan, Skagit, and Whatcom counties).[25] Within these critical habitat areas, federal projects (or projects receiving permitting or funding from federal agencies) must not interfere with the existence of a listed species or adversely impact its habitat.

IV. ENFORCEMENT OF THE GROWTH MANAGEMENT AND THE ENDANGERED SPECIES ACT

The ESA is enforced by NOAA and infringements of the ESA can result in fines or legal action, but rarely do. However, a major political problem is the potential conflict between the ESA and the GMA, especially since 1999 when the Chinook was declared a threatened species under the ESA. The major source of the conflict is the many urban streams within the metropolitan area that are habitats for Chinook, while further urban development within the Urban Growth Areas (and the associated paving) increases the urban runoff that pollutes these streams. There is no easy solution. One possibility may be to prioritize among these urban streams (e.g., the Bear Creek restoration in Redmond) and ensure that these are protected, but the connectivity of these streams makes it very difficult (options are discussed further below). Figure 1 illustrates some of the connections between the ESA, the State, and other levels of government, highlighting the complexity of the relationships.

[25] King County is the most relevant county for this paper. For a map showing the habitats in the broader Puget Sound area, *see* NAT'L OCEANIC AND ATMOSPHERIC ADMIN., PUGET SOUNDS CHINOOK SALMON ESU, http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/Maps/upload/chinpug.pdf (last visited Oct. 30, 2008).

FIGURE 1: GROWTH MANAGEMENT AND THE ENDANGERED SPECIES ACT



V. THE KLAMATH RIVER

The differences among the parties in the ESA-GMA pale in comparison with the struggle over the Klamath River. The salmon story in Washington State is primarily a governmental issue involving many jurisdictional levels, with environmentalists and developers largely on the sidelines. In the Klamath case, it was a

bitter fight among private groups with the government authorities not quite on the sidelines but trying, with little success, to persuade these parties to negotiate a settlement.

The issues here are too complicated to aim for more than a brief sketch in the space available. The Klamath River is 263 miles long, starting in Southern Oregon (Lake Ewauna) with its mouth in the Pacific Ocean in Del Norte, California. The main fish in the river are Chinook, Coho, Steelhead, and Rainbow Trout.There is a classic water dispute between farmers and fishermen, complicated by the involvement of several Native American tribes (the Yurak, Hupa, Karuk, and the Klamath Tribes Confederation), several environmental groups, PacifiCorp, three county governments, two state governments, and six federal agencies (pre-eminently the NMFS, the U.S. Fish and Wildlife Service, and the U.S. Bureau of Reclamation). An important institutional consideration in this case and some other environmental issues in a few other locations in the United States is the existence of tribal stakeholders. The Klamath River has an important sacred role in tribal culture and the tribes are much more interested in salmon protection than in agriculture. Especially if and when the issue is ultimately resolved, the tribes would be quite active in cooperating in co-management with the federal, state, and county governments and other public agencies.[26]

Farming in the region began in 1905 when a federal irrigation project converted 80,000 acres of wetlands into 2,400 farms (now reduced and/or consolidated into 1,400 farms). To protect the rest of the region, the nation's first waterfowl refuge (the Lower Klamath National Wildlife Refuge) was established on 49,600 acres in 1908.[27] Two additional refuges (covering an additional 32,000 acres) were set up in 1928 at Tule Lake and in the Upper Klamath area.[28]

The power company, PacifiCorp, has six hydroelectric dams on the river, of which only four (built between 1908 and 1962) are

[26] Syma A. Ebbin, *Enhanced Fit Through Institutional Interplay in the Pacific Northwest Salmon Co-management Regime*, 26 MARINE POLICY 253, 253–59 (2002).

[27] *See* U.S. FISH & WILDLIFE SERVICE, LOWER KLAMATH NATIONAL WILDLIFE REFUGE, http://klamathbasinrefuges.fws.gov/lowerklamath/lowerklamath.html (last visited Oct. 30, 2008).

[28] *See* U.S. FISH & WILDLIFE SERVICE, TULE LAKE NATIONAL WILDLIFE REFUGE, http://www.fws.gov/klamathbasinrefuges/tulelake/tulelake.html (last visited Oct. 30, 2008); *see also A New California Wild-Life Refuge*, 68 SCIENCE 421, 421 (1928).

part of the dispute. These dams supply about 72,000 customers. Their existence reduces water flow, and combined with high fish returns and occasional drought conditions lead to many dead fish because of gill rot disease. For the fish to survive without loss in a drought year, water should not be diverted to agriculture because the fish have to swim upstream in late Summer/early Fall to spawn.

By a court order, the water was turned off to farmers in 2001, but was restored by the federal government the following year, killing an estimated 70,000 salmon.[29] The next big step occurred in 2004 when PacifiCorp applied for a fifty-year renewal of its lease. This triggered a move to begin settlement talks in 2005 among all the stakeholders. Drought conditions resulted in a near closure of the commercial fishing fleets in 2005–06 along seven hundred miles of the Pacific Coast, a very serious step although not as severe as the total shutdown of the California and Oregon coasts in May 2008 (discussed below). Then, in March 2006 a judge reversed the federal policy to divert water to the farmers in times of drought.[30]

Along with the NMFS's consideration of how to develop a more equitable distribution of water between fishermen and small farmers, this propelled the secret negotiations forward. Then, in January 2007 the federal government ruled that the dams, if not removed, had to be fitted with fish ladders that would cost $300 million, while PacifiCorp put forward a counterproposal involving a mix of fish ladders and trucking fish upstream to avoid the expense of extra ladders. Many analysts (including some in the U.S. Department of Interior) estimate that it would cost much less (over $100 million less) to remove the dams than to modify them.[31]

Finally, in January 2008 the twenty-six groups came out of their secret meetings with a proposed Agreement. Its main features are the removal of the offending dams and a program to restore the river and its habitat over ten years. The requirements are: approval

[29] PROPELLER, http://food.propeller.com/story/2008/05/02/all-salmon-fishing-banned-on-west-coast (last visited Oct. 30, 2008).

[30] Pac. Coast Fedn. of Fishermen's Ass'ns v. United States Bureau of Reclamation, Civ. No. C02-2006 SBA (N.D. Cal. 2006).

[31] *See* Blaine Harden, *U.S. Orders Modification of Klamath River Dams: Removal May Prove More Cost Effective*, WASHINGTON POST, Jan, 31, 2007, at A03.

by PacificCorp (already denied); the need for a funding mechanism for dam removal; and minimization of environmental impacts associated with dam removal (primarily getting rid of the silt behind the dams). Meanwhile, the federal government continues to support the area, requesting $25 million for Klamath research funding in fiscal year 2009.[32]

There are two problems with the Agreement. First, PacifiCorp refused to sign it. Second, while some environmental groups were parties to the Agreement, others were not. They were especially concerned about the existence of farms within the Tule Lake refuge that they wanted removed. Many environmental groups want the area returned to its original wetlands state. Also, if they believe that the Agreement violates the ESA they have announced their determination to sue. The obvious implication is that despite the Agreement, this struggle is far from over. However, one hopeful sign about the possibility of PacifiCorp cooperation, especially with environmentalists, is that in April 2008 the company signed an agreement with a notable environmental group, Oregon Wild. The company would close down the turbines at one of its dams in the Upper Klamath Lake Area (Link River Dam) for four months each year. The reason is to help protect two related threatened fish species (the Lost River and Shortnose suckers, described locally as mullet, deep lake fishes that spawn in tributary streams) that live only in a very restricted habitat in Tule Lake and nearby lakes.

However, it is not all doom and gloom when we disaggregate regionally. In 2008, 213,607 sockeye salmon were counted at the Bonneville Dam (on the Washington-Oregon border) returning to the Columbia and Snake Rivers, the largest count since 1955 and 25 times the return over the previous decade.[33] In addition, the counts of steelhead are the highest in a decade, and there were relatively good returns of the chinook.[34] The reason for the

[32] Press Release, Commissioner's Office, Washington, D.C., Reclamation's FY 2009 Budget Request is $919.3 Million (Feb. 4, 2008), *available at* http://www.usbr.gov/newsroom/newsrelease/detail.cfm?RecordID=20461.

[33] FISH PASSAGE CENTER, SOCKEYE SALMON ADULT PASSAGE AT BONNEVILLE DAM FROM 01/01/2008 TO 12/31/2008, http://www.fpc.org/adultsalmon/adultqueries/Adult_Query_AllHistoric_Results.asp (last visited Oct. 30, 2008).

[34] FISH PASSAGE CENTER, WEEKLY ADULT RETURN COMPARISON REPORT, http://www.fpc.org/adultsalmon/AdultCumulativeTable.asp (last visited Oct. 30, 2008).

resurgence is unclear. Possible explanations include improved ocean conditions (i.e., nutrient-rich upwelling), higher hatchery releases and/or a federal judge's order in 2006 and 2007 to release extra water over the dams. The evidence suggests, but does not prove, that changes in ocean conditions were not the reason for the low returns on the Klamath and the Sacramento Rivers.

VI. THE SACRAMENTO RIVER

A final example is something of a mystery, the massive depletion of the Chinook salmon in the Sacramento River. Although the discussion here is very brief, hardly a case study, it merits mention because it has resulted in a drastic, but perhaps necessary, government response in the form of a complete ban on both commercial and recreational fishing off the California and Oregon coasts for the 2008 season (May 1–October 31). Taken in April 2008, this is an unprecedented step since the oversight federal agency, the Pacific Fishery Management Council, was established in 1986. The reason was a calamitous decline in the fall-run spawning salmon from 775,000 in the year 2002 to 68,000 in 2007 and an expected number of 60,000 in 2008.[35]

The reasons for the loss are in dispute. The NMFS points to ocean temperature changes destroying much of the Chinook's food supply, but many environmentalists blamed water diversion from the delta, damaged habitat and agricultural pollution. In 2001 and 2005, the average economic loss of Chinook salmon in California and northern Oregon was only 60 percent ($61 million) of the average economic impact of the past two decades.[36] Moreover, the overall impact to California was much higher, $255 million and 2,263 jobs lost, which lead Governor Schwarzenegger to declare a state of emergency.[37]

[35] Jeff Barnard, *Federal Agency Declares West Coast Salmon Fisheries Disaster*, SEATTLE TIMES, May 1, 2008, http://seattletimes.nwsource.com/html/localnews/2004386620_websalmon01.html.

[36] Press Release, Pacific Fisher Management Council, Sacramento Salmon Forecast at All-Time Low (Feb. 28, 2008), *available at* http://www.pcouncil.org/newsreleases/Feb_2008_Sacramento_News_Release.pdf.

[37] Proclamation, Governor of the State of California, State of Emergency: Sacramento River Fall Run Chinook Salmon (Apr. 10, 2008), *available at* http://gov.ca.gov/proclamation/9294/.

VII. THE FOUR PRINCIPLES

The guidelines for this issue requested that the authors address four key principles in evaluating the potential for changes in federal environmental legislation. The recent election has the prospects for bringing in an Administration much more supportive of environmental policy change, although it remains unclear whether the decentralization approach (one of the four principles) will have more appeal than a top-down strategy.

A. *Cross-Cutting*

The salmon case study involves water pollution, species survival, and built environment issues in the Seattle metropolitan area. When the geographical scope is extended to other parts of the West Coast, cross-cutting becomes even more complex. The Klamath River question has failed to be fully resolved in more than fifty years. As pointed out above, there is the conflict between fishermen and farmers squabbling over water rights. On top of that, there is also the always difficult issue of the rights of Native American tribes, especially the Hupa Indians.[38] Furthermore, there are the energy constraints, given the pressure on PacifiCorp to dismantle its four hydroelectric dams on the river.

B. *Trade-Offs*

There are several trade-offs. First, it is difficult to reconcile the contradictions between land use prescriptions as reflected in Washington's GMA and species protection under the ESA. Second, although agriculture, forestry, and fisheries are considered a single sector under standard industrial classification schemes, there is almost an irreconcilable difference between the interests of farmers and fishermen. If the dams on the Klamath River come down, there may be some accommodation not wholly acceptable to either industry on the lines of the Agreement signed in January 2008. However, PacificCorp's refusal to buy into the Agreement makes the outcome highly problematic, at least in the short run. Third, the salmon (especially the Chinook) is an unusual species because it is both endangered and human food. Furthermore, there

[38] *See* ADRIENNE R.S. HARLING, SALMON AND THE INDIGENOUS PEOPLE OF THE KLAMATH RIVER: AN ANNOTATED BIBLIOGRAPHY (2006), *available at* http://www.klamathsalmonlibrary.org/guides/culturalsalmon/index.html.

are acceptable and cheaper substitutes for wild salmon on the West Coast, namely farm-raised salmon, and wild salmon from the Atlantic and Alaska.[39] Fourth, the issues on this topic are complicated for a variety of reasons. For example, many of the costs and benefits of alternative actions are "intangibles," there is no clear single project or policy, the geographical scope of the issues is very broad but primarily sub-national rather than national, and there are many stakeholders involved. All this means that it is difficult, if not impossible, to apply the standard trade-off technique, i.e., cost-benefit analysis, to these cases.

However, there may be trade-offs that have to be faced at the micro (or individual) scale. Let us consider a simple illustration. A family owns a house that backs onto a riparian stream through which salmon (or trout) flow. The view of the stream is very attractive. On the other hand, the family (being very pro-environmentalist) knows that planting a riparian tree buffer close to the bank of the stream would improve the fish habitat, especially by cooling the stream temperature. However, not only does it cost a substantial amount to plant the buffer but research (based on a well known econometric technique, the hedonic pricing model) has shown that the buffer would *reduce* the property value of the house because it deprives homeowners of the view.[40] Hence, the homeowner would lose money on two counts, having to plant trees and a decline in property value. However, in extreme cases of stream deterioration, the household trade-off can be resolved by a subsidy from some level of government, most likely the county level because streams cross city boundaries and these micro-loans are probably too small to be dealt with at the State level, except via pass-through funds. This is merely one of many examples that might be examined.

C. *Scaling Regulatory Authority*

Many aspects of the salmon issue raise very complex regulatory problems. The additional stormwater run-off into rivers

[39] Because some farm-raised salmon are returned to the ocean, there is significant inbreeding and the term "wild salmon" may be misleading; "free swimming" might be a more accurate description.

[40] Siam Mooney & Ludwig M. Eisgruber, The Influence of Riparian Protection Measures on Residential Property Values: The Case of the Oregon Plan for Salmon and Watersheds, 22 THE JOURNAL OF REAL ESTATE FINANCE AND ECONOMICS 273, 283–84 (2001).

and streams resulting from urban development created a direct conflict between the ESA and GMA. In addition, sub-state jurisdictions such as King County, Washington's most developed county, are closely involved in implementing the Growth Management system. The GMA will not be abandoned. Given its popularity, the densification of new urban development will go on. There is some support for modifying the ESA, but the Chinook and other thirteen endangered salmon species are unlikely to be abandoned and the ESA will not be abolished, even though it might be changed.[41]

A further difficulty in this instance is that it is very hard to attribute stream pollution to specific development projects, although it is clear that the rates of stormwater runoff are associated with the aggregate scale of development. In these circumstances, this may be an example of what planners call a "wicked problem," i.e., a policy or planning problem for which there is no adequate or definitive solution.[42] One possibility might be to pass on the responsibility for resolution to Washington State with the federal oversight duties handled primarily via reporting. However, salmon is an interstate problem affecting not only Washington, but also Oregon, California, and Alaska; hence single states solutions are less than ideal. The alternative is for the federal government and Washington State to work on a compromise solution that prioritizes waterways and minimizes development and its environmental consequences near those streams where the salmon are most at risk. As pointed out above, there are two existing instruments that might be able to do this (the Critical Areas Ordinances and the Shoreline Master Plans), but these are local rather than state or federal measures (the Federal Critical Habitat principle has much more limited scope).

The Klamath River salmon problem is even more complicated from a regulatory perspective. A major reason is that many federal agencies are involved, not to mention Oregon State and several counties, and these agencies all have different responsibilities and competing interests. Attempts to resolve the problem have lingered for many years. This may explain the preference of the

[41] For an analysis of possible changes to the ESA, *see* Katrina Wyman, *Rethinking the ESA to Reflect Human Dominion Over Nature*, 17 N.Y.U. ENVTL. L.J. 490 (2008).

[42] Horst W.J. Rittel & Melvin M. Webber, *Dilemmas in a General Theory of Planning*, 4 POLICY SCIENCES 155, 160–67 (1973).

government agencies to let the main parties (the fishing interests, the farming interests, the tribes, and the privately owned power utility) negotiate an agreement. As explained above, this happened with the Klamath Basin Restoration Agreement in January 2008, but given that PacifiCorp did not sign on, the issue may return yet again to the courts.[43]

A third problem relates to the dramatic decline in Chinook on California's Sacramento River. Currently, only the federal government can resolve this because the likely cause is overfishing in two states, California and Oregon. This implies that only the federal government (the Pacific Fishery Management Council is a federal agency) has the authority to shut down the fishing industry for the season, as it did in May 2008.

D. *Decentralized Strategies*

It is difficult to deal with the salmon issues via market-driven forces. The stormwater run-off problem is primarily addressed by regulation. However, the damage to both environmental and development interests might be limited via more research and the provision of better information.

In addition, there has been considerable work on applying point-nonpoint trading to water issues, including stormwater runoff.[44] The basic idea is the same as in conventional emission trading schemes. Non-point dischargers with very low water treatment costs accumulate credits that they sell to higher cost point dischargers who buy the credits to minimize their treatment costs. Overall, the approach improves water quality at an aggregate lower cost *provided that* water quality standards are continuously raised over time. It is a viable concept although it has not been widely used. Unfortunately, it is much easier to implement in a rural than in an urban context. In fact, in many areas, while both

[43] *See supra* note 27 and accompanying text.

[44] *See, e.g.*, Richard D. Horan & James S. Shortle, *When Two Wrongs Make a Right: Second Best Point-Nonpoint Trading Ratios*, 87 AM. J. AGR. ECON. 340, 340 (2005); U.S. ENVIRONMENTAL PROTECTION AGENCY, WATER QUALITY TRADING ASSESSMENT HANDBOOK: CAN WATER QUALITY TRADING ADVANCE YOUR WATERSHED'S GOALS? 1 (2004), *available at* http://www.epa.gov/owow/watershed/trading/handbook/docs/NationalWQTHandbook_FINAL.pdf; David Letson, *Point/Nonpoint Source Pollution Reduction Trading: An Interpretive Survey*, 32 NAT. RESOURCES J. 219, 220 (1992); Esther Bartfeld, *Point-Nonpoint Source Trading: Looking Beyond Potential Cost Savings*, 23 ENVTL. L. 43, 43 (1993).

point source pollution and agricultural non-point source pollution have declined, urban non-point source pollution has increased. Also, the more spatially concentrated the watershed, the more difficult is to measure and monitor the discharges of individual sources (especially the non-point sources). It is also quite common to apply "soft," flexible caps to non-point dischargers and harder, well defined caps to point dischargers. There are other schemes akin to, but somewhat different from, traditional trading. For example, point source high-level dischargers may provide funds for non-point source controls instead of having to introduce advanced and costly treatment solutions. Yet another example is where landowners at a variety of sites agree to preserve pervious land, and accumulate credits that they can sell to developers who then receive the right to build, thereby creating more impervious land (this might be described as a hybrid approach, somewhere between point-nonpoint trading and transfer of development rights).

Also, if high density new development is more profitable to builders, there may be some scope for introducing mitigation fees as a quid-pro-quo to permit new projects. Another option is to implement a transfer of development rights scheme (many jurisdictions already have these programs already in place) to steer development away from locations where salmon habitat might be adversely impacted. However, even without planning interventions, the free market, via supply and demand, may mitigate the loss of Chinook and perhaps some other salmon species. There have been indications that the retail price of wild Chinook may rise to $30 per lb. or more, whereas farm-raised salmon can be bought at $6–8 per lb. with pre-frozen Atlantic salmon only a little more expensive. So, changes in relative prices might have some impact. In any event, it is an anomaly for an endangered species to be caught for food.

In addition, there may be some scope for incentive programs for both firms and households to introduce their own mitigation measures (e.g., riparian buffers). There are also very low-cost actions that households may adopt to minimize the effects of stormwater runoff, in addition to planting trees. In a public education campaign on a King County website the suggestions are: avoid paving, redirect downspouts away from storm drains, do not strip groundcover, avoid landscaping plastic, and minimize the use

of bark.[45] These measures are simple and cheap.

The decentralization strategy for the Klamath River is already in place, although it takes a very different form. The federal government gave responsibility to the interested parties by encouraging them to negotiate a solution rather than dealing with it directly. However, there are some relevant market price issues here. The long-term diversion of water from the river to agriculture might have been less if the price of water to agriculture had been set equal to its marginal social cost rather than being heavily subsidized (as it is throughout the West). However, changes in policy are unlikely in the current era of rising food prices. Similarly, the demolition of the hydroelectric dams is now more difficult to justify on opportunity cost grounds, given rising energy prices and energy supply constraints.

In the Sacramento River case, the prevailing policy has dealt with the problem via command-and-control, i.e., prohibition of fishing. However, if the Chinook loss becomes chronic year-by-year, there may be scope for an incentives program. This could take the form of helping fishermen to switch to other catch (e.g., prawns, black cod). Some of them are doing it already without outside help. Prawn fishing requires re-equipping boats, so this could be subsidized. Another incentives scheme would be to aid fishermen to leave the industry and turn to other work.

Generally, there are also decentralized approaches in terms of resource management. One research group has proposed a hierarchical strategy for salmon restoration efforts paralleling changes in the scale of the problem.[46] For example, macro problems that might occur on the Columbia, Snake, or Sacramento Rivers require intervention at the highest level, but as we move down to the meta scale to deal with smaller rivers, management tasks can be delegated to lower-level agencies, and at the micro level to local environmental groups and non-government organizations. As an example of the micro level, consider stream flow augmentation. An estimated cost of implementation for the

[45] KING COUNTY, HOW YOU CAN HELP SALMON – REDUCING STORMWATER RUNOFF, http://www.metrokc.gov/exec/esa/coverage.htm (last visited Sept. 25, 2008).

[46] Philip Roni et al., *A Review of Stream Restoration Techniques and a Heirarchical Strategy for Prioritizing Restoration in Pacific Northwest Watersheds*, 22 NORTH AMERICAN JOURNAL OF FISHERIES MANAGEMENT 1, 14–17 (2002).

whole Northwest region is between $1 and $10 per capita per year.[47] However, to be successful, the task requires a decentralized approach with hands-on management, monitoring, and scientific application to the local problem's characteristics. The point is that a decentralized strategy could either be public or private; the role of higher levels of government is enabling and providing funds rather than active intervention.

CONCLUSIONS

It may not be wise to generalize from such a few cases, but this paper has a clear message. The federal government has not been very active (at least on the positive front) in most environmental and land use issues. Its intervention in the environment is highly political. The argument that federal action ensures universal adherence to policy decisions might be stronger if there were consistency from one administration and one Congress to another. The downside is that innovation at the state, and even the local, level is discouraged and/or, in the case of the denial of waivers to California with respect to CO_2 controls, prohibited. Furthermore, with respect to land use issues, the federal government has no direct role.

As for the specific cases discussed in this paper, the ESA has not helped to save the salmon because the action stops with the listing. It may not be possible to resolve the salmon problem, but if the federal government wants to do more it needs to facilitate, not mandate. The contradictions between the smart growth land use prescriptions of Washington State embedded in the GMA and the environmental mandates of the ESA cannot be fully resolved, but compromises backed up by supportive research identifying the least damaging locations where development could be allowed to occur and seeking out the most appropriate mitigation measures might have some value. The Klamath River debacle is taking years to resolve with the federal government eventually abandoning transparency to direct the key participants to attempt to work out a settlement behind closed doors with confidential agreements. The 2008 Agreement may go nowhere because PacifiCorp refused to sign, and without their agreement to deal with problems associated

[47] William K. Jaeger & Raymond Mikesell, *Increasing Stream Flow to Sustain Salmon and Other Native Fish in the Pacific Northwest*, 20 CONTEMPORARY ECONOMIC POLICY 366, 366 (2002).

with the dams there can be no resolution. Even if there were unanimous agreement among the participants, there are some environmentalist groups who refused to sign the confidentiality agreement and they could tie this up in court for years. There are two extreme solutions, although neither of them is likely to be politically acceptable. One is to buy off the 1,400 small farmers and pay PacifiCorp either to install all the fish ladders needed or to demolish the dams, but this would cost more, perhaps much more than $1 billion. This solution would satisfy the fishermen, the tribes, and the environmentalists. The alternative is to take the Chinook off the ESA list, at least in the impacted region, but this would be politically difficult. The current situation is that the federal government is putting modest sums towards the Klamath River restoration, but this is merely tinkering with the problem.

In the short run, there appears to be no solution to the Sacramento River issue other than the fishing ban, the ultimate command-and-control instrument. The problem here is the lack of consensus about the source of the fish depletion, so this requires more research. This might be undertaken by federal, state, or private researchers. If the source is in the ocean, the solution, if any, is very long-term. If the source is river-related there might be some mitigation options. In either case, compensation to fishermen is a possibility, in terms of short-term relief (if the fish loss is temporary), in the form of a capital sum (again, a total in the $1 billion range), or via a buyout program for commercial fishing permits[48] to persuade them to leave the industry. Another alternative is an expansion of Limited Access Privilege Programs (LAPPs), more commonly called "catch share" programs.[49]

In conclusion, neither the ESA itself nor the federal government can resolve the problem of salmon protection. The issue is very complex. It is unclear whether any legislative reform at the federal level would make a significant difference. The solutions, if they exist, lie elsewhere.

[48] Examples include the NMFS buyout of groundfish fishermen in the Northeast of 2002 and the Nature Conservancy's purchase of fishing permits in California begun in 2006.

[49] ENVTL. DEFENSE FUND, SUSTAINING AMERICA'S FISHERIES AND FISHING COMMUNITIES: AN EVALUATION OF INCENTIVE-BASED MANAGEMENT 3 (2007), *available at* http://www.edf.org/documents/6119_sustainingfisheries.pdf; David Festa et al., *Sharing the Catch, Conserving the Fish*, ISSUES IN SCI. and TECH. 75, 78 (2008).