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The Amphibious Salmon: The Evolution of Ecosystem Management in the Columbia River Basin

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The Amphibious Salmon: The Evolution of Ecosystem Management in the Columbia River Basin

Michael C. Blumm*

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INTRODUCTION

The Columbia River is the paradigmatic example of the influence of technology on an ecosystem. Throughout the twentieth century, the river and its tributaries have been mined for hydropower, transportation, and flood control. The Columbia Basin now possesses the largest interconnected hydroelectric system in the world and a seaport

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* Professor of Law, Northwestern School of Law of Lewis & Clark College; Co-Director, Northwest Water Law and Policy Project. Adapted from remarks delivered at the symposium The Ecosystem Approach: New Departures for Land and Water on February 21, 1997 at Boalt Hall. Mary Surlock kindly provided comments on a draft of this essay, and Molly McCluer, an LL.M. candidate at Northwestern School of Law of Lewis & Clark College, and Scott Yates, J.D. 1996, Northwestern School of Law of Lewis & Clark College, supplied research assistance. The title of this essay is a distant descendant of Scott Reed's The Public Trust Doctrine: Is it Amphibious, 1 J. ENVTL. L. & LIT. 107 (1986).

over 400 miles inland. Unfortunately, the cost of this progress has been high: the Columbia Basin's wild salmon runs, once the world's largest, now teeter on the brink of extinction.

Salmon are important not merely for those who harvest them, but also are the ultimate barometer of the health of aquatic ecosystems. Salmon also have deep cultural, historic, and religious significance, particularly to Northwest Indian tribes. For these reasons it is not an exaggeration to suggest that salmon are the spiritual soul of the Pacific Northwest.

For over a decade and a half, the region has tried to reverse the salmon's decline. During that time, the Northwest Power Act's Columbia Basin Fish and Wildlife Program, once touted as the world's largest biological restoration project, has been eclipsed by Endangered Species Act (ESA) listings. Strangely, reliance on large-scale technological fixes to cure the Columbia Basin's ills has continued under the ESA. The river's ecosystem is now so hostile to young salmon that they are barged and trucked downriver to escape the dams. And in an effort to compensate for high fish mortalities in the river, millions of hatchery-reared fish continue to be released into the river. Although recent scientific reports advocate greater reliance on more natural processes, current policy remains heavily reliant on technological fixes.

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3. See THE NORTHWEST SALMON CRISIS: A DOCUMENTARY HISTORY (Joseph Cone & Sandy Ridlington eds., 1996) [hereinafter NORTHWEST SALMON CRISIS].

4. See id. at 174-93, 216-38.


6. See 6 WATERS AND WATER RIGHTS, supra note 2, at 104-05; Beyond Parity, supra note 5, at 34-36, 40.


9. See COLUMBIA BASIN FISH AND WILDLIFE AUTHORITY, DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT: IMPACTS OF ARTIFICIAL SALMON AND STEELHEAD PRODUCTION STRATEGIES IN THE COLUMBIA RIVER BASIN 6, 36-38 (1996) [hereinafter CBFWA STUDY] (recommending maintenance of hatcheries both to continue to produce
The failure to restore the depleted Columbia Basin over the last two decades has prompted the evolution of a new approach to the problem: ecosystem management. This approach to saving the salmon has ushered in a new era in natural resources policy in the Northwest. Ecosystem management under this model has been what Jim Krier called policymaking by exfoliation: learning by trying and failing.\textsuperscript{10}

This Article discusses the history of manipulation of the Columbia Basin ecosystem for economic ends, current efforts to restore Columbia Basin salmon, and the effects of those efforts on both hydroelectric operations and public land management. It considers the Northwest Power Act, the ESA, the President's Northwest Forest Plan, and the proposed Interior Columbia Basin Ecosystem Management Project. The Article concludes that the effort to save the Northwest's signature natural resource has helped to transform land and water management in the region and may provide a working model of ecosystem management over a vast landscape. Moreover, since the salmon's influence is extending upland beyond aquatic habitats to become an important goal in public land management, the salmon's influence on regulatory policy may be considered amphibious.

I

THE DECLINE OF COLUMBIA BASIN SALMON

Prior to white settlement, life in the Pacific Northwest revolved around salmon. Salmon were at the center of native life, the linchpin of native diet, commerce, and religion.\textsuperscript{11} After hearing years of historical and anthropological evidence, Judge Boldt determined that the tribes of the Northwest shared "a universal and generally paramount dependence" on salmon.\textsuperscript{12} Called the salmon people, they were North America's richest aboriginals, for the salmon trade gave them wealth considerably beyond subsistence.\textsuperscript{13} The salmon were the Northwest's equivalent of the Great Plains buffalo\textsuperscript{14} and the Arctic reindeer.

\footnotesize{\textsuperscript{10} See James E. Krier & Edmund Ursin, Pollution & Policy 289-95 (1977).}  
\footnotesize{\textsuperscript{11} See Anthony Netboy, The Columbia River Salmon and Steelhead Trout: Their Fight for Survival 10, 16-17 (1980); Atsushi Sakurai & John N. Cole, Salmon 7 (1980).}  
\footnotesize{\textsuperscript{12} United States v. Washington, 384 F. Supp. 312, 350 (W.D. Wash. 1974) (holding that the treaties of 1855 and 1856 entitled the tribes to half of the harvestable runs of salmon).}  
\footnotesize{\textsuperscript{13} See American Friends Serv. Comm., Uncommon Controversy: Fishing Rights of the Muckleshoot, Puyallup, and Nisqually Indians 3 (1970).}  
\footnotesize{\textsuperscript{14} See David H. Getches, Changing the River's Course: Western Water Policy Reform, 26 Env'tl. L. 157, 160 (1996).}
Forty years after Lewis and Clark reached the Columbia Basin in 1805, white settlement began in earnest with migration along the Oregon Trail. Within a decade, conflicts between the new immigrants and the natives occasioned the signing of treaties in which the natives ceded sixty-four million acres of land, while reserving for themselves only small areas of land and the right "of taking fish . . . in common with" the new settlers.15 This treaty right, which in 1974 Judge Boldt would interpret to reserve to the tribes half of the harvestable salmon,16 did not restrain white fishermen from overharvesting the salmon to such an extent that, in an effort to maintain salmon harvests, hatcheries began to be constructed as early as 1877.17 In some parts of the Columbia Basin, such as the Yakima and Umatilla Rivers, irrigation became so widespread by the turn of the century that salmon were extirpated from their spawning habitat.18 The response to what might be called "the first great salmon crisis" was state regulation of harvests and more hatcheries, but no restraints on water diversions. The result was that commercial salmon harvests declined steadily after 1925,19 as reflected in the Figure A below.

![Figure A: Oregon and Washington Departments of Fish and Wildlife](image)

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17. UPSTREAM, supra note 7, at 50; NORTHWEST SALMON CRISIS, supra note 3, at 47-48.
18. See DIETRICH, supra note 1, at 243-44 (discussing early irrigation efforts in the Yakima Basin).
Even as the northwest states began to control harvests through regulation, a new threat to salmon arose in what might be called "the second great salmon crisis." The new threat was dam building which, beginning in the 1930s, the Northwest pursued in earnest (with considerable financial assistance from the federal government). By the 1970s the Columbia Basin was "damned to servitude." Thirteen dams on the mainstem Columbia and Snake Rivers now impede salmon migration. And many more storage projects in the upper basin have transformed the basin's once enormous spring freshet—on which downstream migrating salmon depended for transport to the ocean—into a series of reservoirs used to provide irrigation, hydro-power, navigation, flood control, and flatwater recreation. All this was accomplished within forty years, a stunning monument to the triumph of twentieth century technology.

Obviously, the salmon fared poorly in the face of this development, as Figure A indicates. What is sometimes overlooked is that the chosen antidote to this technological triumph was more technology, primarily a wholesale commitment to hatcheries, designed to "mitigate" the damage caused by the dams. The region now has scores of hatcheries aimed at providing substitute salmon. These hatcheries present new challenges, for the substitute hatchery fish do not survive as well as wild fish. The hatcheries also replace upriver fish with lower river fish, since most hatcheries are situated downriver of the dams. This shift has the effect of maintaining ocean harvests at the expense of river harvests, crippling tribal fisheries in the process.

Another prominent mitigation technology is the U.S. Army Corps of Engineers program of trucking and barging juvenile salmon from the upper basin to the lower basin below the dams. This "transportation" program, as it is called, began two decades ago, a reflection of the reality that the mainstem Columbia and Snake Rivers are now so hostile to juvenile salmon that they are thought better off in the holding tanks of trucks or barges than in what was their native habitat. Environmentalists, Indian tribes, and many biologists in state agencies fiercely oppose the transportation program because they view it as an excuse for not changing the operation of the dams to

20. See NORTHWEST SALMON CRISIS, supra note 3, at 75-85.
21. See id. at 95-130.
22. Robbins, supra note 19, at 21 (quoting Molly McFerran) (emphasis omitted).
23. See WHITE, supra note 1, at 106 (referring to the Columbia as "a virtual river").
24. See CBFWA STUDY, supra note 9, at 64-78.
25. See UPSTREAM supra note 7, at 52 (noting that over eighty hatcheries have been constructed in the Columbia Basin).
27. See UPSTREAM, supra note 7, at 241 (endorsing the transportation program).
make the river less lethal to migrating fish.28 A number of recent scientific studies question whether transportation has produced net benefits to the salmon.29

The Corps' trucking and barging program epitomizes the developed Columbia River, where one technology attempts to mitigate the effects of another. As one of my colleagues, Dan Rohlf,30 likes to say, only the Army Corps of Engineers could concoct a scheme in which grain and other agricultural commodities are shipped on the river, and the salmon are loaded on to trucks to ride on Interstate 84.31 In short, the developed Columbia Basin represents the antithesis of ecosystem management, a basin dominated by technology. The Columbia is, as William Dietrich has written, the quintessential twentieth century river, the river of the dynamo,32 no longer a river dominated by salmon.

II

PRINCIPLES OF ECOSYSTEM MANAGEMENT

The concept of ecosystem management can be traced to the writings of Aldo Leopold,33 and even before, to the 1932 nature sanctuary plan adopted by the Ecological Society of America's Committee for the Study of Plant and Animal Communities.34 But only a few visionaries35 seriously considered the idea of using ecosystems as the basis for land management until Secretary of the Interior Bruce Babbitt

28. See Beyond Parity, supra note 5, at 25 n.13, 83.
29. See Return to the River, supra note 8, at 328; see also Philip R. Mundy et al., Transportation of Juvenile Salmonids from Hydroelectric Projects in the Columbia Basin: An Independent Peer Review 116-17 (1994).
32. See Dietrich, supra note 1, at 46 (contrasting the Columbia, the twentieth century river, with the Mississippi, the emblematic river of the nineteenth century, with keelboats and Huck Finn).
34. See Victor E. Shelford, Report of the Committee for the Study of Plant and Animal Communities and of the Committee on the Preservation of Natural Conditions, 14 Ecology 229-31 (1933); see also Victor E. Shelford, The Preservation of Natural Biotic Communities, 14 Ecology 240-45 (1933) (recognizing the importance of protecting both ecosystems and individual species, arguing for factoring in natural disturbance regimes into management policy, and advocating the use of a core reserve/buffer zone approach to natural area protection).
adopted it as a means to ameliorate the single-species approach of the Endangered Species Act, which he claimed brought on "train wrecks" like the conflict between logging old growth forests in the Northwest and preserving the northern spotted owl.\textsuperscript{36}

The concept of ecosystem management remains undefined on a number of issues, including its goals, the appropriate scale of its application, and its most useful decisionmaking structure. However, several themes dominate the discussion on these issues.\textsuperscript{37} After reviewing the literature, in 1994, Edward Grumbine identified ten dominant themes: 1) adoption of a "systems perspective" to biodiversity hierarchy; 2) use of ecological, not administrative or political boundaries; 3) protection of total native diversity (species, populations, and ecosystems); 4) research and data collection and use of that information in management; 5) monitoring the results of management to provide ongoing feedback; 6) use of adaptive management principles to provide flexible management in the face of uncertainty; 7) cooperation among government agencies and between the government and private parties; 8) organizational changes in land management agencies; 9) recognition of the fundamental role of humans in ecological processes; and 10) the dominance of human values in setting ecosystem management goals.\textsuperscript{38}

The same year, Senator Mark Hatfield sponsored a bill in Congress entitled the Ecosystem Management Act of 1994, which would have amended the Federal Land Policy and Management Act to require ecosystem management on public lands managed by the Bureau of Land Management.\textsuperscript{39} The bill would have established the following as ecosystem management principles: 1) human populations are an integral part of ecosystems; 2) human needs should be addressed by recognizing the dependence of human economies on viable ecosystems; and 3) a systems approach to ecosystem management will further the goal of conserving biodiversity.\textsuperscript{40} Under the bill, ecosystem management would promote the stewardship of natural resources by fostering the formation of public and private partnerships, promoting public participation, using the best available scientific knowledge, and establishing cooperative planning and management that crosses jurisdictional boundaries and involves coordination among federal, tribal,


\textsuperscript{37} See Richard Haeuber, Setting the Environmental Policy Agenda: The Case of Ecosystem Management, 36 NAT. RESOURCES J. 1, 5-7 (1996).

\textsuperscript{38} See Grumbine, supra note 35, at 29-31.

\textsuperscript{39} See S. 2189, 103rd Cong. (1994).

\textsuperscript{40} See id. § 2(b) (amending § 216 of the Federal Land Policy and Management Act (FLPMA)).
state, local, and private landowners. The bill would have established an Ecosystem Management Commission which would have been responsible for: 1) developing a definition of ecosystem management; 2) identifying appropriate geographic scales to employ the concept; 3) developing implementation strategies recognizing both the role of human populations in the operation of ecosystems and the dependency of human populations on sustainable ecosystems for the production of goods and services; and 4) examining federal laws, policies, and budgets to identify changes necessary to facilitate ecosystem management. Unfortunately, Senator Hatfield’s bill failed to obtain a hearing, and he subsequently retired.

In the following sections, this Article contends that ecosystem management has been attempted in the Columbia Basin for over a decade and a half, albeit perhaps in a rudimentary form, in an effort to rescue the Columbia’s depleted salmon runs. The results therefore should be of some interest to those seeking to employ ecosystem management in other contexts and places.

III

SALMON RESTORATION UNDER THE NORTHWEST POWER ACT

In the late 1970s it became evident that some Columbia Basin salmon runs, especially those in the upper basin, were not going to survive development without substantial changes in the operation of the dams. In fact, in 1978, the National Marine Fisheries Service and the U.S. Fish and Wildlife Service initiated a status review to consider whether to list upriver runs under the ESA. This began “the third great salmon crisis,” from which we have yet to recover.

In 1980, two years after the ESA proceedings began, Congress enacted the Pacific Northwest Electric Power and Conservation Planning Act (the Northwest Power Act), a truly remarkable piece of legislation, which induced the federal fishery agencies to suspend the ESA proceedings to give the new statute a chance to bear some fruit. The Act not only rewrote the marching orders of the Northwest electric power system, it also committed the power system to protect and restore the fish and wildlife damaged by hydropower “to the extent affected by the development and operation” of the system. Henceforth, fish and wildlife were to be considered “co-equal partners” with

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41. See id.
42. See id. (amending § 217 of FLPMA).
45. Id. (h)(10)(A).
hydropower, treated “on a par” with the other authorized purposes of the dams.\textsuperscript{46}

To carry out these promises, the Act created a new interstate compact agency, the Pacific Northwest Electric Power and Conservation Planning Council (the Council), and charged it with developing both an electric power plan and a fish and wildlife restoration program.\textsuperscript{47} The statute also incorporated some of the essential principles of what would later be called ecosystem management. For example, it called for a basinwide approach to salmon restoration more sensitive to ecological than political boundaries.\textsuperscript{48} And like modern ecosystem management, the 1980 statute called for decisionmaking based on “best available scientific knowledge,”\textsuperscript{49} and which factored in both human and biological considerations, although favoring the latter in conflicts between the two.\textsuperscript{50} Also, like modern ecosystem management, the statute created new institutional relationships that might be considered partnerships.\textsuperscript{51} Finally, in an innovation from which ecosystem managers might learn, the Northwest Power Act tapped the revenues from hydroelectric power sales to finance fish and wildlife restoration.\textsuperscript{52}

Therefore, implementation of the Northwest Power Act serves as a good case study to evaluate ecosystem management efforts in practice. What have we learned over the last fifteen years? In a word, we have learned humility.

Implementation of the statute began in earnest in 1982, when the Council promulgated its Columbia Basin Fish and Wildlife Program,\textsuperscript{53} which set as its goal the doubling of the basin’s salmon runs.\textsuperscript{54} The centerpiece of the program was something called “the water budget.”

\textsuperscript{46} H.R. REP. NO. 96-976, at 49, 56 (1980).
\textsuperscript{47} See 16 U.S.C. § 839b(a) (creation of Council); id. § 839b(e) (power plan); id. § 839b(h) (fish and wildlife program).
\textsuperscript{48} See id. § 839b(h)(1)(A).
\textsuperscript{49} Id. § 839b(h)(6)(B).
\textsuperscript{50} See id. § 839b(h)(6)(C) (authorizing minimum cost alternatives only where they achieve “the same sound biological alternative”).
\textsuperscript{51} These included not just the interstate council but also the statute’s implicit recognition of Indian tribes as the equals of state fish and wildlife agencies, the Council’s uncertain amount of control over federal water project operations, and the Council’s deference to the recommendations of the fishery agencies and Indian tribes in formulating the restoration program. See Unraveling Parity, supra note 5, at 668-70.
\textsuperscript{52} 16 U.S.C. § 839b(h)(8)(A); see id. at 668; John M. Volkman & Kai N. Lee, Within the Hundredth Meridian: Western States and Their River Basins in a Time of Transition, 59 U. COLO. L. REV. 551 (1988).
\textsuperscript{54} The doubling goal was actually set in 1987 amendments to the program. See Unraveling Parity, supra note 5, at 686.
The water budget was a volume of storage water made available to representatives of the basin’s fishery agencies and Indian tribes to use to aid downstream salmon migration in the spring and summer. Heralded as a pathbreaking reallocation of water from hydropower to salmon and of decisionmaking authority from federal water project operators to state and tribal representatives, the water budget proved to be a disappointment. It contained too little water, did not extend over the entire salmon migration season, and was only intermittently implemented by the Bonneville Power Administration, which questioned the Council’s authority to establish it.

The water budget was not the only shortcoming of the Council’s program. Although the program aimed to double the total number of salmon in the Northwest, it allowed the desperate condition of individual salmon stocks to be overlooked. It was these weak runs which prompted the invocation of the ESA less than a decade after promulgation of the Council’s Columbia Basin Program. Another shortcoming of the program was the Council’s benign neglect approach to overseeing program implementation. Federal water managers regularly failed to implement program measures, such as the water budget, and the Council failed to apply a promised adaptive management approach to improve salmon migration. Finally, the program was hampered by a lack of jurisdiction over important aspects of the salmon life cycle. For example, the program had no authority over salmon harvests, water rights, existing hatchery practices, or public land management. The statute authorized the program to direct its attention to the adverse effects of hydropower only. The program therefore did not have authority to truly manage on an ecosystem basis; although basinwide, the Northwest Power Act did not direct itself to the “problemshed.”

The shortcomings of the Northwest Power Act were evident in a 1991 report published in the Journal of the American Fisheries Soci-

55. JODY LAWRENCE ET AL., THE WATER BUDGET: A STEP TOWARDS BALANCING FISH AND POWER IN THE COLUMBIA RIVER BASIN (Environmental Eng’g and Science Dep’t of Civil Eng’g, Univ. of Wash., Technical Report No. 81, 1983).
56. See Unraveling Parity, supra note 5, at 675-77.
57. See id. at 716 n.326 (detailing the declines in individual runs reported by National Marine Fisheries Service and the Oregon Department of Fish and Wildlife in 1990); Michael C. Blumm, Saving Idaho’s Salmon: A History of Failure and a Dubious Future, 28 IDAHO L. REV. 667, 687-89 (1992) [hereinafter Saving Idaho’s Salmon].
58. See Unraveling Parity, supra note 5, at 684, 688-89, 738 (noting the Council’s consistent failure to implement or enforce its own programs).
59. See id. at 728-29, 740.
erty, entitled *Pacific Salmon At the Crossroads*.\(^{62}\) The *Crossroads* report showed that there was a Pacific Coast-wide salmon crisis, identifying over 200 salmon stocks at risk of extinction from the Canadian to the Mexican border.\(^{63}\) The report also indicated that only six percent of the remaining salmon habitat was in relatively good condition.\(^{64}\) The alarm sounded by the *Crossroads* report contributed to the ensuing listings of Snake River salmon under the ESA and the development of the Northwest Forest Plan.\(^{65}\)

**IV
THE ENDANGERED SPECIES ACT AND COLUMBIA BASIN SALMON**

The era of ESA protection for Columbia Basin salmon began in March 1990, when the Shoshone-Bannock tribe submitted a petition to list the Snake River sockeye. Two months later, a coalition of environmental groups submitted a similar petition concerning Snake River chinook.\(^{66}\) This beginning underscores one of the great virtues of the ESA, the public petition process, under which the merits of petitions must be judged on biological, not economic grounds.\(^{67}\) By 1992, both the sockeye and chinook were listed.\(^{68}\)

These listings moved salmon restoration efforts beyond mitigating the effect of hydroelectric operations because the ESA required biological consultation on all federal activities adversely affecting the salmon, including harvest regulation, hatchery funding, and habitat management on federal lands.\(^{69}\) The prospect of ESA listings awoke the Northwest Power Planning Council from its slumber, and in a vain attempt to ward off the ESA listings, in late 1991 the Council amended its program,\(^{70}\) calling for the first substantive improvements in river operations in a decade. Upon close inspection, however, these improvements only made it more likely that the Snake River water

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\(^{63}\) See *id.* at 8-18.

\(^{64}\) See *Northwest Salmon Crisis*, supra note 3, at 291.

\(^{65}\) See *id.* at 295-300.

\(^{66}\) See *Unraveling Parity*, supra note 5, at 714.


\(^{70}\) See *Beyond Parity*, supra note 5, at 39-40.
budget would be met; they did not promise to increase the amount of water in the budget or lengthen its season.\footnote{See Saving Idaho's Salmon, supra note 57, at 692. But cf. id. at 691-92 (noting that the 1991 amendments did increase the amount of water available for fish migration on the upper Columbia River).}

Although the Council’s 1991 amendments failed to prevent the ESA listings, the National Marine Fisheries Service (NMFS) used the amendments in 1992 to conclude that operation of the Columbia Basin hydroelectric system would not jeopardize the continued existence of the listed species.\footnote{See National Marine Fish. Serv., Endangered Species Act Section 7 Consultation/Conference Biological Opinion: 1992 Operations of the Federal Columbia River Power System 50 (1992), discussed in Beyond Parity, supra note 5, at 40-41.} In other words, according to NMFS, implementation of the Northwest Power Act satisfied the ESA. However, when NMFS made the same determination the next year concerning 1993 operations, the era in which salmon restoration plans went unchallenged ended, as the state of Idaho sued NMFS, claiming that its 1993 biological opinion (BiOp) was arbitrary decisionmaking.\footnote{See Idaho Dep’t of Fish & Game, 850 F. Supp. at 890-91; Beyond Parity, supra note 5, at 42-44; Will Whelan, Idaho’s Strategy in Idaho Department of Fish and Game v. National Marine Fisheries Service, 25 EnvTL. L. 399 (1995) (explaining that Idaho’s claim focused on NMFS’s failure to consider points raised by the states and the tribes).}

About the same time, a coalition of environmental groups and the Yakima Indian Nation sued the Northwest Power Planning Council, alleging that the 1991 amendments to its program failed to satisfy the directives of the Northwest Power Act.\footnote{See Northwest Resource Info. Ctr., Inc. v. Northwest Power Planning Council, 35 F.3d 1371 (9th Cir. 1994), cert. denied, 116 S. Ct. 50 (1995); Beyond Parity, supra note 5, at 44-49; Adam Berger, An Insider’s Perspective on Northwest Resource Information Center v. Northwest Power Planning Council, 25 EnvTL. L. 369 (1995) (explaining the motivation and strategy of the suit).}

Somewhat surprisingly, since they promised improvements over the status quo, the courts struck down both the Council’s 1991 amendments and NMFS’ 1993 BiOp. The District Court of Oregon determined that the BiOp violated the ESA by adopting an arbitrary baseline by which to measure progress, discounting low probabilities in its modeling of the effects, and ignoring the recommendations of state and tribal biologists.\footnote{See Idaho Dep’t of Fish & Game, 850 F. Supp. at 892-900. See id. at 900.}

Judge Malcolm Marsh was unusually critical of NMFS efforts, writing that “The process is seriously, significantly flawed because it is too heavily geared towards a status quo that has allowed all forms of river activity to proceed from a deficit situation—that is, relatively small steps, minor improvements, and adjustments—when the situation literally cries out for a major overhaul.”\footnote{See Idaho Dep’t of Fish & Game, 850 F. Supp. at 892-900. See id. at 900.}
for failing to make required statutory findings and for failing to defer to the biological recommendations of the state fishery agencies and Indian tribes, evinced remarkably similar sentiments, warning against "lowest common denominator" approaches to salmon restoration that were politically acceptable but biologically ineffective.77

Sent back to the drawing boards by the courts, NMFS and the Council produced revised restoration plans that, while promising increased protection for migrating salmon from hydroelectric operations, differed in important respects. Both plans envisioned that some juvenile salmon would be transported in trucks and barges, and some would travel in the river, with subsequent review and evaluation to determine which method was most effective. But the Council's approach, approved in December 1994, was to decrease the role of artificial transport and to increase flow velocities in the Snake River by drawing down two reservoirs for two months of the year during the height of the spring migration.78 This "seasonal drawdown" approach drew praise from salmon advocates and derision from commodity users, especially power and navigation interests, the latter wishing to preserve Lewiston as a deepwater port. About three months later, in March 1995, NMFS released a new BiOp which did not adopt the Council's approach to seasonal drawdowns on the Snake; instead, the BiOp promised to make salmon the priority resource in the operation of dams on the Columbia by boosting spring and summer flows but continuing to barge and truck a majority of salmon on the Snake.79

Thus, the NMFS BiOp reflected a kind of "two rivers" approach for an interim period during which inriver and artificial transportation would be studied and a final decision made in 1999 as to which was most effective.80

Environmentalists have been critical of the NMIFS BiOp for its heavy reliance on artificial transport. For example, in 1995, an estimated seventy-eight percent of Snake River salmon were trucked or

77. See Northwest Resource Info. Ctr., 35 F.3d at 1395 stating that:
TheCouncil's approach seems largely to have been from the premise that only small steps are possible, in light of entrenched river user claims of economic hardship. Rather than asserting its role as a regional leader, the Council has assumed the role of a consensus builder, sometimes sacrificing the Act's fish and wildlife goals for what is, in essence, the lowest common denominator acceptable to power interests and [Direct Service Industries].


80. See id. at 92-94.
barged, even though the policy of the ESA is to conserve not only the listed species but the ecosystems on which they depend. Moreover, environmentalists complain that because the BiOp does nothing to improve Snake River flows, the comparison of artificial versus inriver transport is unfair because the inriver salmon are migrating in an already hostile environment.

A coalition of environmental groups and the state of Oregon sued NMFS, charging that the BiOp would not avoid jeopardizing the survival of the salmon. The district court upheld the BiOp, ruling that its optimistic assumptions and forty-eight year recovery period were not arbitrary or capricious, even though the court questioned the soundness of the high level of risk that NMFS chose to tolerate. Thus, Judge Marsh, who only three years earlier called for “a major overhaul” in river operations, ratified NMFS’ approval of hydroelectric operations that countenance annual mortalities of up to eighty-six percent of juvenile Snake River sockeye and spring/summer chinook salmon and up to ninety-nine percent of juvenile fall chinook salmon. The court noted that NMFS claimed to be implementing “an ecosystem management approach to improving the likelihood of recovery of the listed species” and emphasized that there were competing ecological considerations due to concerns for other species.

81. See Memorandum from Michele DeHart, Fish Passage Center, to Members Liaison Group, FPAC 7 (Oct. 13, 1995) (on file with the Fish Passage Center).
83. See American Rivers v. Nat’l Marine Fisheries Serv., Civ. No. 96-384-MA (D. Or. Apr. 3, 1997) in which the plaintiffs also charged that federal water management agencies failed to implement the BiOp, a charge supported by a review of 1995 operations in Beyond Parity, supra note 5, at 83-98. But the court rejected this claim, ruling that only one flow target was missed, that there was no evidence that this failure harmed the species, and that since it was unlikely to be repeated, the issue was moot. See American Rivers, Civ. No. 96-384-MA at 28. Federal agencies also failed to implement the reservoir drawdowns called for in the Council’s program, presumably because they consider the program to be merely advisory. Arguably, however, the Council’s program is no less binding than the NMFS BiOp. See Beyond Parity, supra note 5 at 61 n.253, 64-65.
84. See American Rivers, Civ. No. 96-384-MA. Describing the life cycle models on which NMFS relied as “truly educated guess-work at best,” id. at 22, the court wrote: Whether the salmon may be saved in time to benefit from such long-term system improvements is the risk that NMFS and the action agencies have assumed within this process. Given the dwindling numbers, time is clearly running out. As a long-time observer and examiner of this process, I cannot help but question the soundness of the selected level of risk acceptance, but the ESA says nothing about risk tolerance and the limits of judicial review dictate that I not interfere with a federal agencies’ [sic] exercise of professional judgment or their reasoned decisions.
85. See supra note 76 and accompanying text.
86. See American Rivers, Civ. No. 96-384-MA at 18-19.
87. Id. at 11, citing 1995 BiOp, supra note 79, at 1.
88. The court mentioned that the Kootenai white sturgeon, an ESA listed species, requires flows which differ from those proposed for the salmon, and that the needs of the
and that neither the Columbia Basin states nor the basin’s Indian tribes agreed as to whether the NMFS approach was adequate. The decision means that NMFS can pursue its experiment with barging and trucking juvenile salmon until 1999 and perhaps longer.

V
THE TRIBAL RESTORATION PLAN AND PERMANENT RESERVOIR DRAWDOWNS

As if two salmon restoration plans were not enough, the Columbia Basin tribes that had treaty rights formulated their own plan in 1995. The tribal plan eschewed artificial transportation completely and advocated permanent, not seasonal, reservoir drawdowns. Although clearly not enforceable, the tribal approach gained some support as a result of two recent studies, one economic and one biological.

The economic study, prepared for the Corps of Engineers, suggested that seasonal drawdowns were a waste of time and money and contended that the real choice was between permanent drawdowns and continued truck and barge transport. The study claimed that the permanent drawdowns were only marginally more expensive than seasonal drawdowns, and would "about double annual salmon population production." This study encouraged advocates of artificial transport, however, noting that preliminary results from 1994 showed a higher percentage of survival among those fish transported than those remaining in the river.

resident bull trout, see infra note 137 and accompanying text, under consideration for ESA listing, were "competing ecological considerations." American Rivers, Civ. No. 96-384-MA at 5.

89. Idaho, which had challenged the 1993 NMFS BiOp, see supra note 81 and accompanying text, now defended the NMFS approach, while Oregon challenged it. See American Rivers, Civ. No. 96-384-MA at 6. Also, the Colville and Spokane tribes, defended NMFS’ limits on drawing down the reservoir behind the Grand Coulee Dam, while the lower basin tribes claimed that these limits made the NMFS BiOp inadequate. See id. at 6-7.

90. See supra note 80 and accompanying text.


92. See id., supra note 91, at 5B-25-30.


94. Id. at 1-16. Permanent drawdowns would cost only $23 million annually more than seasonal drawdowns. See id. at 1-15. Moreover, permanent drawdowns would avoid $100 to $150 million in rehabilitation costs for the four Snake River dams beginning about the year 2000. See id. at 1-18.

95. See id. at 11-3 to 11-10.
The Council's independent scientific group conducted the biological study that supported permanent drawdowns. The group based its recommendations explicitly on ecosystem management principles and called for restoration of the natural functions of the ecosystem that produced salmon. The study called this returning to "normative river conditions." The study recommended rejecting the Columbia Basin's historic emphasis on technological fixes like hatcheries and artificial transportation. Instead, it urged an ecosystem approach that would: 1) focus on mainstem spawning, rather than spawning in headwaters streams, because historically the most productive spawning areas in the upper basin were in the mainstem; 2) concentrate on maintaining and expanding existing healthy salmon populations, like those in the undammed Hanford Reach of the Columbia, before attempting to reintroduce salmon into areas from which they had been extirpated; and 3) impose a bias against technological fixes that circumvent natural processes, since the technologies that dominate current policy were adopted with little or no scientific study.

Perhaps the most arresting aspect of the study was its endorsement of permanently drawing down mainstem reservoirs, such as those behind John Day and McNary Dams in the lower Columbia, to restore miles of mainstem spawning habitat. This recommendation gave scientific credibility to the tribal permanent drawdown approach. Whether the recommendation will be taken seriously by policymakers is not yet clear.

VI

SALMON AS THE LINCHPIN OF THE NORTHWEST
FOREST PLAN

The manner in which the hydroelectric system is operated will most importantly affect the restoration of Columbia Basin salmon. But salmon restoration will also require habitat protection and rehabilitation in watersheds throughout the Basin. Public land management provides the best example of the amphibious salmon, for recognition of the need to protect and restore salmon habitat is having a mighty influence on public land planning throughout the Northwest. In fact, the Northwest salmon crisis arguably has had a greater effect on public land management than on river operations.

96. Return to the River, supra note 8, at xvii, 5, 7, 19-20. For a discussion of this study, see Beyond Parity, supra note 5, at 112-17.
97. See Return to the River, supra note 8, at 328, 397-98, 508-10.
98. See id. at 268-69, 508-13.
99. See id. at 268-69, 513.
100. See Upstream, supra note 7, at 8-19, 164-203, 205-225; Return to the River, supra note 8, at 130-165, 353-356.
The primary example of the effect of concern over salmon populations is the Northwest Forest Plan, the product of President Clinton's Northwest Forest Conference, which in turn was a response to court injunctions on federal timber harvests after the listing of the northern spotted owl under the ESA. The Northwest Forest Plan, covering more than twenty-four million acres of federal land, brought ecosystem management to public land planning on a grand scale. While the impetus for the plan may have been the President's desire to preserve both northern spotted owl habitat and federal timber harvests, the heart of the plan is an "aquatic conservation strategy" (ACS) designed to "restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them." 

The ACS has four main components: 1) riparian reserves, which consist of eleven percent of the lands subject to the plan, some 2.6 million acres; 2) designated key watersheds, which serve as refuges for aquatic species; 3) a required watershed analysis to ensure that activities in key watersheds and other sensitive areas are consistent with ACS objectives; and 4) a watershed restoration program to improve fish habitat, riparian habitat, and water quality. The ACS limits timber harvests within riparian reserves (which vary in size, with the largest adjacent to fish-bearing streams) to those salvage operations that further the purpose of the ACS. Any management activities


104. See id. at B-18.

105. See id. at B-20.

106. See id. at B-30.

107. The width of riparian reserves for fish-bearing streams is up to two "site-potential trees," which is the average maximum height of the tallest dominant trees 200 years or older, or 300 feet. *Id.* at C-30 to C-31. There are five categories of riparian reserves, the smallest of which is 100 feet for non-fish-bearing intermittent streams. See NORTHWEST FOREST PLAN EIS, supra note 102, at B-87. The width of riparian reserves can be changed as a result of watershed analysis. See id. at B-89.
must be preceded by a watershed analysis.\textsuperscript{108} In key watersheds, which have priority for restoration programs, no new roads may be built in "roadless areas" and no net increase of roads may occur in "roaded areas."\textsuperscript{109} Watershed analysis must also precede management in key watersheds.\textsuperscript{110}

Watershed analysis is therefore the linchpin in the Northwest Forest Plan's approach to ecosystem management. This analysis is to be a "systematic procedure" to evaluate current riparian conditions, assess the effect of proposed activities on the watershed, institute monitoring programs, refine the boundaries of riparian reserves, and develop restoration projects.\textsuperscript{111} Watershed analysis is designed to enhance the NEPA process by providing "a scientifically based understanding of the processes and interactions occurring within a watershed," but is not intended to be a decisional process itself. Instead, it is to serve as an intermediate level of analysis between large-scale plans and site-specific NEPA analyses.\textsuperscript{112} Watershed analyses must evaluate a variety of ecological and human use patterns, including cumulative effects.\textsuperscript{113} The plan also authorizes public participation, although the degree of public involvement will vary depending on the issue, the watershed, and the availability of information.\textsuperscript{114} Whether the public can appeal faulty watershed analysis, as it can appeal faulty NEPA analysis, is an open question.\textsuperscript{115}

The Northwest Forest Plan itself survived a court challenge, although the district court concluded that the plan was barely sufficient to satisfy the requirements of the ESA.\textsuperscript{116} This decision was affirmed by the Ninth Circuit,\textsuperscript{117} but the plan is still under attack in the

\textsuperscript{108} Northwest Forest Plan ROD, \textit{supra} note 103, at C-32.

\textsuperscript{109} \textit{Id.} at B-19. The plan identifies two types of key watersheds: 1) those which directly contribute to salmon and bull trout (a member of the salmonid family) conservation; and 2) those which have high water quality but no at-risk fish. \textit{See id.} at B-18.

\textsuperscript{110} \textit{See id.} at B-20. Watershed analysis is also required outside of key watersheds within roadless areas inventoried for wilderness designation. \textit{See id.}

\textsuperscript{111} \textit{Id.} at B-21.

\textsuperscript{112} \textit{See U.S. DEP'T OF AGRIC., FOREST SERV., A FEDERAL AGENCY GUIDE FOR PILOT WATERSHED ANALYSIS} 7-9 (1993) [hereinafter \textit{FEDERAL GUIDE}].

\textsuperscript{113} \textit{See Northwest Forest Plan ROD, supra} note 103, at E-21.

\textsuperscript{114} \textit{See id.} at E-20; \textit{FEDERAL GUIDE, supra} note 112, at 10.

\textsuperscript{115} Since watershed analysis is designed as an intermediate level of analysis, \textit{see supra} note 112 and accompanying text, it is unlikely that such analysis would be ripe for judicial review until a particular activity was authorized. At that point, faulty watershed analysis could perhaps be an issue in a NEPA suit.

\textsuperscript{116} \textit{See Seattle Audubon Soc'y v. Lyons}, 871 F. Supp. 1291, 1300 (W.D. Wash. 1994) (noting that "any more logging sales than the plan contemplates would probably violate the laws.").

\textsuperscript{117} \textit{See Seattle Audubon Soc'y v. Mosely}, 80 F.3d 1401 (9th Cir. 1996).
District Court for the District of Columbia. Although the plan has been criticized for being substantively deficient, and it may be premature to assess its on-the-ground effects, the plan has ushered in a process that could revolutionize public land management.

Public land management has traditionally divided itself into management of reserves set aside for specific purposes, usually preservation, and management of multiple-use lands. More often than not, commodity production has dominated the multiple-use lands. Although this state of affairs seems to violate the intent of the multiple-use statutes by segregating uses instead of simultaneously producing compatible uses, the courts have given land managers wide berth to interpret multiple-use as they see fit. As a result, multiple-use became a "vacuous platitude." The rise of watershed analysis at the heart of ecosystem management, as reflected in the Northwest Forest Plan, offers the prospect of fundamentally redefining the meaning of multiple-use to emphasize the protection of dependent aquatic species, while de-emphasizing (although not overlooking) commodity production. If watershed analysis leads to priority for uses that do

118. See Northwest Forest Resource Council v. Dombeck, 107 F.3d 897 (D.C. Cir. 1997) (reversing the district court's dismissal of the suit on stare decisis grounds and remanding the case).

119. See Lacey, supra note 101, at 356-88 (criticizing the plan because it does not apply to private lands, has few substantive restraints on management within key watersheds, fails to assure that roads will not be built in non-inventoried roadless areas, lacks clear standards for changing the boundaries of riparian reserves, and lacks specific criteria governing watershed analysis).


121. See generally George Cameron Coggins & Robert L. Glicksman, Public Natural Resources Law (1997 ed.).


124. See, e.g., Perkins v. Bergland, 608 F.2d 803, 806 (9th Cir. 1979) (stating that the definition of multiple use "breathes discretion at every pore").

125. See Coggins, supra note 123, at 230.

126. This redefinition of multiple use was presaged by then Arizona Governor Bruce Babbitt in remarks to the 1985 annual meeting of the Sierra Club: The time is at hand to go beyond multiple use. Mining entry must be regulated, timber cutting must be honestly subordinated to watershed and wildlife values,
not harm aquatic habitat, the result may be the most enduring legacy of the amphibious salmon.

VII

SALMON AND THE INTERIOR COLUMBIA BASIN ECOSYSTEM MANAGEMENT PROJECT

The fullest expression of ecosystem management in the Columbia Basin will be in the Interior Columbia Basin Ecosystem Management Project.127 This immense planning project, covering some 75 million acres of federal land east of the Cascade Mountains128 (more than three times as large as the Northwest Forest Plan) resulted from the fact that the scope of the Northwest Forest Plan was not broad enough to match the migratory range of the salmon it sought to protect. Judicial injunctions of federal land management activities pending ESA consultation concerning listed Snake River salmon stocks also propelled the project.129 The ensuing consultation called for the Forest Service and the Bureau of Land Management to increase protection for salmon habitat by instituting watershed analysis similar to that in the Northwest Forest Plan.130 The land managers responded by establishing interim aquatic habitat protections131 and promising to develop an ecosystem-based management strategy for all federal lands in the interior Pacific Northwest east of the Cascades.


128. See id. at 3.


130. See Feldman, supra note 129, at 282-84.

The Interior Columbia Basin Project is so vast that it has been divided into two environmental impact statements, one covering the lands east of the Cascades in Oregon and Washington, the other covering lands in Idaho, western Montana, and small portions of Utah and Nevada. There is some irony in an ecosystem planning strategy that divides itself along political boundaries, but both draft EISs devote a great deal of attention to aquatic ecosystems. The draft EISs have, however, been the subject of sustained criticism from the environmental community, largely due to a lack of prescribed management standards and a failure to propose conservation reserves forbidding development activity in critical areas. Although the contents of the final Interior Columbia Basin Ecosystem Management Project will not be known until some time in 1998, it seems likely that something similar to the aquatic conservation strategy in the Northwest Forest Plan will be extended throughout the Interior Columbia Basin.

A number of recent and pending legal developments will assure that land managers devote substantial attention to the effects of their activities on aquatic resources. For example, prodded by a district

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133. Although the project produced separate EISs, there apparently will be only one final record of decision. Telephone interview with Mary Scurlock, Pacific Rivers Council (Oct. 21, 1997).
135. The Pacific Rivers Council summarized the flaws in the draft EISs as follows:

[The draft EISs] do not acknowledge the severity nor the widespread nature of the declines in aquatic species; they do not respond to the correlation between land disturbance (particularly roadedness [sic]) and habitat degradation; they do not protect the remaining aquatic strongholds within the basin; and they do not call for a comprehensive, coordinated aquatic restoration program.

court decision, the U.S. Fish and Wildlife Service recently agreed to propose the bull trout for listing under the ESA. The listing of this migratory freshwater fish—an indicator species like salmon—will subject land management activities in the Interior Columbia Basin to ESA consultation. This consultation no doubt will produce procedures quite similar to the aquatic conservation strategy contained in the Northwest Forest Plan. Similarly, developments under the Clean Water Act, particularly upgraded water quality standards and the setting of load allocations for streams not meeting water quality standards, will demand more aquatically sensitive federal land management, especially since water quality standards are enforceable by federal citizen suits in the Ninth Circuit. Moreover, a recent court decision subjecting the issuance of federal grazing permits to the Clean Water Act’s water quality certification requirements will supply the procedural means to insist upon grazing practices that are compatible with aquatic protection. All of these developments will encourage the spread of the watershed analysis and aquatic protection strategy in the Northwest Forest Plan eastward throughout the vast Interior Columbia Basin.

CONCLUSION

At the root of the evolution of ecosystem management in the Columbia Basin are efforts to preserve and restore what were once the largest salmon runs in the world. Though the restoration program under the Northwest Power Act has failed to achieve its objective and

137. See Bull Trout Proposal Due by June 10, OREGONIAN, Apr. 26, 1997, at A13 (reporting that the federal government agreed to propose by June 10, 1997 that bull trout in the Columbia and Klamath river basins be listed under the Endangered Species Act).
138. State water quality standards must be reviewed every three years. See 33 U.S.C. § 1313(c)(1) (1997). Oregon recently used this triennial review to revise and upgrade its water quality standard for temperature, requiring most streams for which salmon rearing is a designated beneficial use to meet a numeric criterion, 64°F, subject to exceptions, or develop a surface water temperature management plan. OR. ADMIN. R. 340-041-0205(2)(b) (1997).
140. See Marble Mountain Audubon Soc'y v. Rice, 914 F.2d 179, 182 (9th Cir. 1990) (allowing environmental plaintiffs to enforce water quality standards against federal land managers under the provisions of the Administrative Procedure Act); Oregon Natural Resources Council v. United States Forest Serv., 834 F.2d 842, 851-52 (9th Cir. 1987) (same).
has now been eclipsed by ESA proceedings, the program began the
march toward ecosystem management a decade and a half ago by in-
stituting basinwide planning.\textsuperscript{142} Systematic consideration of the ef-
fects of the hydroelectric system on the salmon continues under ESA
consultation, even though NMFS has chosen to emphasize barging
and trucking listed stocks rather than to proceed with additional in-
river improvements like increased flows and reservoir drawdowns.\textsuperscript{143}
That a federal court would ratify a barging and trucking program
under the rubric of ecosystem management\textsuperscript{144} is a reflection of how
malleable the concept can be. Judicial ratification of the NMFS resto-
ration program means that the process of exfoliation—learning by
failing—is likely to continue until 1999, when NMFS promises to
make a decision on inriver versus truck and barge transport of juve-
nile salmon.\textsuperscript{145}

Among the lessons of the ecosystem management approach to
restructuring Columbia Basin hydroelectric operations is that new
plans and changed processes alone are not enough to assure the suc-
cess of restoration efforts. For example, the innovative water budget
proved to be a failure in large measure because of a lack of implemen-
tation on the part of federal water management agencies and a lack of
oversight on the part of the Northwest Power Planning Council.\textsuperscript{146}
Ecosystem management plans, however innovative, cannot be effec-
tive unless they are enforced.

Ecosystem management, as currently practiced, may not prove
capable of reversing the decline of Snake River salmon,\textsuperscript{147} but the
concept could produce more salutary results outside the river on pub-
lic lands. Watershed analysis at the core of ecosystem management
offers the prospect of revolutionizing multiple use in federal land deci-
sionmaking.\textsuperscript{148} If, as seems likely, the Interior Columbia Basin
Ecosystem Management Project adopts an aquatic conservation strat-

\textsuperscript{142} See supra Part III.
\textsuperscript{143} See supra Part IV.
\textsuperscript{144} See supra notes 84-90 and accompanying text.
\textsuperscript{145} See supra note 80 and accompanying text.
\textsuperscript{146} See supra notes 55-56 and accompanying text.
\textsuperscript{147} Perhaps the best chance for improving in-river migration of Snake River salmon
may come through the assertion of the reserved water and fishing rights of Columbia Basin
Indian tribes in the ongoing Snake River Basin Adjudication, which will determine about
ninety percent of the water rights in Idaho. See Dar Crammond, Counting Raindrops:
for the Northwest Water Law and Policy Project, a project of the Natural Resources Law
Institute, Northwestern School of Law of Lewis & Clark College) (on file with author). It
is conceivable that the tribes, which may possess senior rights to most of the water in the
state, might choose to settle their claims. See 4 WATERS AND WATER RIGHTS, supra note
2, at § 37.04(c)(1) (discussing Indian water right settlements). Part of that settlement could
involve implementation of the tribal salmon restoration plan. See supra Part V.
\textsuperscript{148} See supra notes 105, 108, 110-115, 121-126 and accompanying text.
egy similar to that in the Northwest Forest Plan management of federal public lands in the Pacific Northwest will be much different in the twenty-first century than it has been in the twentieth. The chief legacy of the amphibious salmon, then, may be a significant change in public land management, even as several upper Columbia Basin salmon runs continue to decline toward extinction.

POSTSCRIPT

After this Article was in press, Professor Oliver Houck gave the ninth annual Distinguished Environmental Lecture at Northwestern School of Law of Lewis and Clark College, delivered on September 11, 1997. In his talk, entitled "Are Humans Part of Ecosystems" Professor Houck pointed to the Columbia Basin Ecosystem Management Project as an example of standardless process, which he claimed amounted to little more than a 1990s version of multiple use management. He argued that the interim protections that land managers adopted as a result of ESA consultation provided greater protection to riparian areas than anything promised in the project's draft EISs, echoing some of the criticisms of the environmental community.

I do not wish to be interpreted as quarreling with Professor Houck's worries about the on-the-ground effects of the Columbia Basin Ecosystem Management Project. It might indeed produce nothing more than glorified multiple use management, which would alarm me as much as Professor Houck. The truth is that anything that we might say at this time about the effect of this ecosystem planning effort is mere speculation. However, my sense of the real-world effects of the Northwest Forest Plan's aquatic protection strategy is that it has materially changed the way federal land managers approach timber sales and other land management activities, and the Interior Columbia Basin Ecosystem Management Project—despite its lack of specific standards—may do the same, in part because some of the missing standards will be provided by other laws like the ESA and the Clean Water Act. I know that Professor Houck hopes optimism is warranted.

149. See supra notes 102-115 (Northwest Forest Plan), 130-131, 134 (Columbia Basin Ecosystem Management Project) and accompanying text.
151. See supra note 131 and accompanying text.
152. See supra note 135 and accompanying text.
154. See supra notes 100-126.
155. See supra notes 136-141 and accompanying text.