

**ECOSYSTEM SERVICES IN THE KLAMATH BASIN:
BATTLEFIELD CASUALTIES OR THE FUTURE?**

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I. THE KLAMATH CONFLICT: FISH AND BIRDS BUT NOT ECOSYSTEM SERVICES

A. *The Imposition of a Working Landscape on an Ecosystem*

The Upper Klamath Basin in southern Oregon and northern California has long been characterized by its aridity, remoteness from population centers, and short growing season. Today, the entire Klamath Basin is known for the intensity and bitterness of the competing demands for its limited, dependable water supplies. The Upper Basin irrigation community's entrenched water entitlements, enjoyed undisturbed for a century,¹ are being challenged by Indian tribes, government and non-governmental entities acting to enforce the Endangered Species Act (ESA),² and Lower Basin fishing communities.³

Over a century of intensive upstream irrigation diversions and dams has produced a highly stressed ecosystem from headwaters to the Pacific Ocean. Before white settlement, the Upper Basin was one of the West's great functioning wetland ecosystems, a vast network of interconnected shallow lakes and marshes.⁴ The Klamath ecosystem sustained both wildlife and Indians.⁵ The marshlands of the Upper Basin supported large local and migratory bird populations as well as populations of two large (up to two feet long), long-lived (surviving up to thirty or forty years) fish called qapdo and c'wam.⁶ These fish were venerated by the Klamath Indians, for whom they provided a major food source.⁷ The ecosystem survived relatively intact until the end of the nineteenth century; however, as was the case in many of areas of the world, a productive ecosystem was shrunk in size and in function to permit irrigated agriculture.

1. See RICHARD A. SLAUGHTER, JOINT INSTITUTE FOR THE STUDY OF THE ATMOSPHERE AND OCEAN, WATER ALLOCATION UNDER STRESS: INSTITUTIONAL COMPARISON OF SNAKE AND KLAMATH RIVER 19 (2004) (the Snake River basin has a long history of adaptation to change compared to Klamath, which had no history of adaptation prior to 2001).

2. Endangered Species Act of 1973, 16 U.S.C. §§ 1531-1543 (2006).

3. The Klamath is actually two basins, an upper and lower. The Upper Basin lies on the fringe of the Great Basin. The Lower Basin encompasses a large part of far northwestern California and runs to the Pacific through a rugged mountainous terrain. Indian tribes and commercial and recreational fishermen have long prized the river for its salmon runs. See Holly Doremus & A. Dan Tarlock, *Fish, Farms, and the Clash of Cultures in the Klamath Basin*, 30 *ECOLOGY L.Q.* 279, 289-92 (2003) [hereinafter *Fish, Farms, and the Clash*].

4. See *id.* at 291.

5. See TUPPER ANSEL BLAKE ET AL., *BALANCING WATER: RESTORING THE KLAMATH BASIN* 35-37 (Univ. Cal. Press 2000) (discussing the Klamath area before white settlement) [hereinafter *BALANCING WATER*].

6. *Id.* at 136.

7. Reed D. Benson, *Giving Suckers (And Salmon) An Even Break: Klamath Basin Water and the Endangered Species Act*, 15 *TUL. ENVTL. L.J.* 197, 202 (2002).

The Upper Basin was one of the last areas of the Pacific Northwest investigated by trappers⁸ and opened to white settlement.⁹ Its remote location initially allowed it to survive the first waves of western settlement and “progress.” The rugged mountains of the Lower Basin ensured that downstream settlement would be very modest, except at the mouth of the Klamath on the Pacific Ocean. In Oregon, small-scale irrigation began in the late nineteenth century and accelerated after the passage of the Reclamation Act of 1902.¹⁰ The Klamath was chosen as one of the first federal irrigation projects.¹¹ President Theodore Roosevelt overruled the engineers in the newly created Reclamation Service who argued that federal funds should be targeted to the areas with the best potential for irrigation and instead opted for a policy of the geographical distribution of projects.¹² President Roosevelt opted for distribution of reclamation throughout the West to help his chances for reelection in 1904.¹³ Hardy pioneers, including many Czech immigrants fleeing the decaying Austro-Hungarian Empire, eventually put some 400,000 acres under irrigation, about half supplied by the federal Klamath Project.¹⁴ The Upper Basin’s geographic history lives in place names like Tule Lake, although the vast majority of the region’s wetlands were long ago drained and converted to agriculture.¹⁵

8. Peter Skene Odgen led the first trapper party into the area between 1826-1827. See JEFF LALANDE, *FIRST OVER THE SISKIYOU: PETER SKENE OGDEN’S 1826-1827 JOURNEY THROUGH THE OREGON-CALIFORNIA BORDER* (1987).

9. *Fish, Farms, and the Clash*, *supra* note 3, at 288.

10. Reclamation Act of 1902, 43 U.S.C. § 372 (1902). For a detailed description and history of the Klamath Project, see ERIC E. STENE, BUREAU OF RECLAMATION HISTORY PROGRAM, *THE KLAMATH PROJECT* (1994), available at <http://www.usbr.gov/dataweb/html/klamathh.html>.

11. U.S. FISH AND WILDLIFE SERVICE, BIOLOGICAL/CONFERENCE OPINION REGARDING THE EFFECTS OF OPERATION OF THE U.S. BUREAU OF RECLAMATION’S PROPOSED 10-YEAR OPERATION PLAN FOR THE KLAMATH PROJECT AND ITS EFFECT ON THE ENDANGERED LOST RIVER SUCKER (*DELISTES LUXATUS*), ENDANGERED SHORTNOSE SUCKER (*CHAMISTES BREVIROSTRIS*), THREATENED BALD EAGLE (*HALIAEETUS LEUCOCEPHALUS*) AND PROPOSED CRITICAL HABITAT FOR THE LOST RIVER AND SHORTNOSE SUCKERS 3 (2002) [hereinafter FWS 2002 BIOP], available at http://www.usbr.gov/mp/kbao/docs/Final_Biological_Assessment_02-25-02.pdf.

12. DONALD J. PISANI, *TO RECLAIM A DIVIDED WEST: WATER, LAW, AND PUBLIC POLICY 1848-1902* 312 (1992).

13. *Id.* The Clean Water Act similarly distributed sewage treatment grants, distributing the grants among the states regardless of the severity of pollution. 33 U.S.C. §§ 1251-1387 (2006). Likewise, the Department of Homeland Security now showers high tech security around the country in areas of both high and low risk.

14. STENE, *supra* note 10.

15. Before white settlement, there were about 185,000 acres of wetlands in the basin; today only 36,000 remain. ERNIE NIEMI, ET AL., *ECONORTHWEST, COPING WITH COMPETITION FOR WATER: IRRIGATION, ECONOMIC GROWTH, AND THE ECOSYSTEM IN THE UPPER KLAMATH BASIN*, 19 (2001) [hereinafter *COPING WITH COMPETITION*], available at <http://www.salmonandeconomy.org/pdf/KlamathWater.pdf>.

B. Ecosystem Restoration Proxies Emerge

As the Upper Basin was being drained, there were no strong competing uses or opposing interests to “speak” for the ecosystem. Nonetheless, for most of the past century, irrigation and the ecosystem were still able to coexist. For example, the Lost River and shortnose suckers, as they are now known, once inhabited all the major lakes of the Upper Basin and their tributaries,¹⁶ supporting multiple canneries.¹⁷ These fish remained the target of a recreational as well as a tribal fishery until catches sharply declined in the 1980s.¹⁸ The decline continued even as the modern environmental movement laid the foundation for the appreciation of the importance of maintaining ecosystem functions including endangered species conservation. More recently, we have come to recognize that ecosystems provide many valuable human services.¹⁹

It has proved very difficult to translate this appreciation into effective ecosystem conservation. In contrast to pollution and toxic substances control, it has been much harder to conserve ecosystems and to maintain the services that they provide. Ecology’s insights came long after strong land and water legal entitlements or political expectations evolved to support the maintenance of the status quo, regardless of the environmental damage that it causes. Thus, ecosystem services, as we now define them, are either provided by proxies or by new institutions, which are generally costly because their provision must be overlaid by over-established exploitation regimes. In the West, the two existing proxies for ecosystem conservation and service provision to challenge the status are wildlife refuges and Indian tribes who seek to maintain historic fisheries. Both were in place during the heyday of the Reclamation Era, but neither was powerful enough to resist the rise of irrigation.

Before World War I, wildlife refuges were established in the Upper Basin, but wildlife conservation was consistently subordinated to irrigation.²⁰ A proud local Indian tribe had inhabited the area for over 14,000 years, but just as the Italians rejected the cold northern Reformation devoid of pageantry and artistic splendor, the Klamaths had no interest in the alien, white idea of irriga-

16. FWS 2002 BIOP, *supra* note 11, at 21.

17. *See id.* at 35.

18. Endangered and Threatened Wildlife and Plants, 53 Fed. Reg. 27130, 27131 (July 18, 1998).

19. *See infra* Part II.A. for a discussion of the conceptual foundations of ecosystem service provision and the difference between conservation of ecosystem function and service provision.

20. *See* Benson, *supra* note 7, at 205-06.

tion.²¹ The Klamath Indians were first put on a reservation and then driven to the brink of extinction. During the tragedy of the Eisenhower administration's embrace of the idea of ultimate Indian assimilation into "white society" through reservation termination, the Klamath reservation was wiped off the map.²² For most of the twentieth century, the white irrigators were able to assume that the basin's limited supplies of water would be almost exclusively dedicated to irrigation in perpetuity regardless of the environmental and social costs. However, the changes in resource use triggered by the environmental and Indian rights finally reached the Basin by the 1980s, long after other areas of the west had begun to adjust to this paradigm shift.

C. *Environmental Change Comes to the Klamath*

The vehicles that brought environmentalism to the Basin and continue to sustain it are the ESA and the Indian sovereignty movement.²³ The Klamaths were eventually restored to tribal status,²⁴ and the remnant Tribe supported the listing of the two stressed suckers under the ESA.²⁵ During the 1990s, the United States Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) began to issue Biological Opinions suggesting that the basin's main storage space, Klamath Lake, should be maintained at high summer levels to support the two federally listed fish.²⁶ Small percentage cutbacks and wet years avoided an outright conflict between the ESA and irrigation until the drought summer of 2001.²⁷ To comply with the ESA, the United States Bureau of Reclamation, which administers the Reclamation Act of 1902,²⁸ ordered the cutoff of ninety percent of normal deliveries to the Klamath Project.²⁹ The Bureau took this drastic unprece-

21. *Fish, Farms, and the Clash*, *supra* note 3, at 296.

22. The story is briefly told in CHARLES WILKINSON, *BLOOD STRUGGLE: THE RISE OF MODERN INDIAN NATIONS* 120-121 (2005). *See also* THEODORE STERN, *THE KLAMATH TRIBE: A PEOPLE AND THEIR RESERVATION* (Monograph 41 of the American Ethnological Society 1965)

23. *Id.* at 324-27.

24. Benson, *supra* note 7, at 203.

25. *Endangered and Threatened Wildlife and Plants: Determination of Endangered Status for the Shortnose Sucker and Lost River Sucker*, 53 Fed. Reg. 27130, 27131 (July 18, 1988).

26. Benson, *supra* note 7, at 218.

27. Between October 2000 and August 2001, the Basin received fifty-four percent of its normal rainfall—6.93 compared to 13.05 inches. Michael Milstein, *Clearing Up Water Issues in the Klamath Basin*, *THE PORTLAND OREGONIAN*, Aug. 29, 2001.

28. 32 STAT. 388 (1902) (presently codified in scattered sections of 43 U.S.C.).

29. U.S. BUREAU OF RECLAMATION, *KLAMATH PROJECT 2001 OPERATIONS PLAN* (Apr. 6, 2001).

mented action in response to biological opinions issued by FWS and NMFS which concluded that normal summer irrigation releases would threaten the survival of the Lost River shortnose suckers, bald eagles in Upper Klamath Lake, the project's principal reservoir, and downstream Coho Salmon.³⁰ The potential of the ESA to limit state water rights and federal contract entitlements in the Upper Basin had long been anticipated,³¹ especially in the Klamath basin, but the 2001 summer irrigation season cutoff was the first time that the Bureau had actually closed the headgates to protect a listed species.³² Things got worse. The summer of 2002 produced a large downstream salmon kill, and downstream, commercial, and recreational fishermen as well as several Tribes have brought additional political and legal pressure to the Upper Basin.³³

Fallout was immediate and dramatic. In 2001, protests and a brief outbreak of violence followed.³⁴ The Klamath became a West-wide—and even national—symbol of the clash between the virtuous, commodity-producing rural West and the economically irrational, illegitimate ESA supported only by “eco-radicals.”³⁵ In the end, neither a new Sagebrush rebellion was triggered nor has the ecosystem been stabilized.³⁶ Since the summer of 2001, cutoffs have been avoided due to a combination of factors, including having wet years, a National Academy of Sciences study asserting there was insufficient evidence to conclude the chosen lake levels were necessary to protect the species in the stressed ecosystem,³⁷ and a revised Biological Opinion by the farmer friendly, environmentally hostile Bush II administration which spread ESA com-

30. The literature on the Klamath crisis in 2001 is already substantial. See Benson, *supra* note 7, for a history of the legal events that led to the 2001 shut down. Post 2001 events are analyzed in *Fish, Farms, and the Clash*, *supra* note 3; Marcilynn Burke, *Klamath Farmers and Cappuccino Cowboys: The Rhetoric of the Endangered Species Act and Why it (Still) Matters*, 14 DUKE ENVTL. LAW & POL'Y F. 441 (2004); Holly Doremus & A. Dan Tarlock, *Science, Judgment, and Controversy in Natural Resources Regulation*, 26 PUB. LAND & RESOURCES L. REV. 1 (2005) [hereinafter *Science, Judgment, and Controversy*].

31. See OREGON WATER RESOURCES DEPARTMENT, RESOLVING THE KLAMATH (1999), available at http://www1.wrd.state.or.us/pdfs/klamath_summary99.pdf.

32. The Bureau cut water deliveries in 1992 and 1994, but did not cut off all water deliveries. *Id.* at 28.

33. See *infra* notes 34-40 and accompanying text.

34. *Fish, Farms, and the Clash*, *supra* note 3, at 321-23.

35. See *id.*

36. See *id.*

37. NATIONAL RESEARCH COUNCIL, ENDANGERED AND THREATENED FISHES IN THE KLAMATH RIVER BASIN: CAUSES OF DECLINE AND STRATEGIES FOR RECOVERY (2003) [hereinafter ENDANGERED AND THREATENED FISHES]. In June 2007, the Washington Post reported that Vice President Richard Cheney initiated the NRC request, overruling the objections of the former's lobbyist that independent NRC panels were “a roll of the dice.” Jo Becker & Barton Gellman, *Leaving No Tracks*, THE WASHINGTON POST, Wednesday, June 27, 2007, at A01.

pliance duties over ten years.³⁸ A wide range of public and private stakeholders have unsuccessfully tried to find a more permanent solution to balance irrigation and ecosystem conservation, but the underlying degradation is continuing and the “problem-shed” continues to expand.³⁹ Lower salmon fisheries have been severely stressed by upstream water use and fishing communities have been put at risk.⁴⁰

D. A Possible Role for Ecosystem Services

Since 2001, two resource use paradigms and the landscape visions that they support have competed for dominance in the Klamath. The first is the continuation of the West as a commodity production region. The second is a new West of urban archipelagoes, large biodiversity reserves, eco-tourism and “rationalized,” sustainable agriculture. The first vision views the Klamath as an irrigation district that must, at best, accommodate the “accident” that it is also the habitat of several endangered species and the spawning grounds for Coho Salmon, with the minimum disruption of the status quo. The alternative vision is less clear because it could range from an unrealistic pre-white settlement baseline to a more realistic managed landscape that supports a wide range of ecosystem services and limited agriculture focused on high-value specialty crops.

These visions lie behind the strategies that all sides follow to advance their interests. For environmentalists and salmon fisherman, the rigid enforcement of the ESA is the best way to force the necessary changes in the basin. To irrigators, resistance to the ESA and takings suits are the way to maintain the status quo. Neither have moved the basin to a more sustainable landscape. Therefore, the Klamath Basin would seem to be a good place to experiment with ecosystem services provisions, including provider payments, as a way to reduce resource conflicts and reshape the landscape.

This has not happened to date, although it could happen because ecosystems are hard to kill physically⁴¹ and economic

38. U.S. DEPT. OF INTERIOR, BUREAU OF RECLAMATION, FINAL BIOLOGICAL ASSESSMENT: THE EFFECTS OF PROPOSED ACTIONS RELATED TO KLAMATH PROJECT OPERATION (APRIL 1, 2002 - MARCH 31, 2012) ON FEDERALLY-LISTED THREATENED AND ENDANGERED SPECIES 1 (Feb. 25, 2002) [hereinafter BR FINAL 2002 BIOLOGICAL ASSESSMENT].

39. See *Fish, Farms, and the Clash*, *supra* note 3, at 324-35.

40. *Id.* at 326.

41. The best example of a revived ecosystem is Mono Lake in California. The ecosystem was in danger of collapse from transbasin water diversions. Good scientific research, litigation, and public monies have led to the increased tributary inflows which appear to have stabilized the ecosystem. Jane Kay, *Mono Lake Restoration: Water's Arising*, S.F.

stresses are a force for change in the Basin. The Klamath is not yet the United States' Aral Sea. Upper Klamath Lake remains the largest section of the wetlands in that region.⁴² The lake is very shallow, much like a marsh, averaging only between eight feet deep when full and three feet deep during dry years.⁴³ In surface area, it is the largest lake in Oregon⁴⁴ and is reportedly the largest freshwater lake in the West.⁴⁵ Other large lakes and marshes remaining in the Upper Basin include Lower Klamath, Tule, and Clear Lakes.⁴⁶ It is the law that makes ecosystems hard to restore. Upper Basin irrigators have been able to capture the right to use most of the flow of the Klamath, and they are naturally reluctant to surrender these water rights or consider alternative landscape visions regardless of the environmental and social costs imposed on discrete downstream residents and society generally.⁴⁷

The case for a service provision experiment is strengthened by the growing realization by all parties that it is unlikely that the status quo can be maintained in the long run. Neither the status quo nor a return to pre-white settlement conditions are ecologically, economically, and socially realistic. The Upper and Lower Basins are dynamic eco- and social systems under stress from the effects of Project and off-Project irrigation and market forces.⁴⁸ The ecosystem stresses include high background concentrations of phosphorus and farming practices that use fertilizers, pesticides, and manure from livestock operations that washes into the rivers and lakes and causes eutrophication.⁴⁹ Upper Klamath Lake is nutrient-rich, and its impaired water quality puts the endangered fish at increased risk.⁵⁰ The operation of Link River Dam for hydropower generation also contributes to the stresses.⁵¹ Ecological

CHRON., July 29, 2006 at A1. See generally Craig A. Arnold, *Working Out an Environmental Ethics: Anniversary Lessons from Mono Lake*, 2004 WYO. L. REV. 1 (2004).

42. *Fish, Farms, and the Clash*, *supra* note 3, at 291.

43. *Id.*

44. Harry Carlson et al., *Upper Klamath Basin Soil Resources*, in WATER ALLOCATION IN THE KLAMATH BASIN RECLAMATION PROJECT, 2001: AN ASSESSMENT OF NATURAL RESOURCE, ECONOMIC, SOCIAL, AND INSTITUTIONAL ISSUES 153 (Ore. St. Univ. 2001), available at <http://extension.oregonstate.edu/catalog/html/sr/sr1037/soil.pdf>.

45. BALANCING WATER, *supra* note 5 at 26.

46. *Fish, Farms, and the Clash*, *supra* note 3, at 291.

47. *Fish, Farms, and the Clash*, *supra* note 3, at 340.

48. The Bureau takes the position that "the Project should not be responsible for effects of all of the water development and land management activities throughout the Basin" on endangered species. BR FINAL 2002 BIOLOGICAL ASSESSMENT, *supra* note 38, at 2.

49. ENDANGERED AND THREATENED FISHES, *supra* note 37, at 102-22 (tracing out the anthropocentric and non-anthropocentric causes of lake pollution).

50. *Id.* at 122.

51. Despite its ownership of Link River Dam, the Bureau contends that it lacks the authority to require PacifiCorp to install fish screens or take other measures to limit entrainment at the Dam. FWS 2002 BiOP, *supra* note 11 at 11.

stresses are compounded by economic ones. For example, the present owner of the utility that serves the project, PacifiCorp, has announced it will not renew an earlier sweetheart deal between its predecessor and the irrigators which provided cheap power rates.⁵² Farmers, especially potato growers, find it hard to compete with other states and global markets.⁵³ Finally, the specter of decreased winter snowpacks and decreased summer flows caused by global climate change hangs over the entire region.⁵⁴

The Klamath is an ongoing story, and any analysis and conclusions must be discounted because the appropriate time horizon to pass judgment is long. A Yurok fisherman summed it up when he said of the possibility of a healthier river, "I may not see it, my dad may not see it, . . . Hopefully it will help out my son further down the road."⁵⁵ This Article examines the case for ecosystem service provision as a way to address the basin's environmental problems and explains why most of the incentives that exist in the Basin favor winner-take-all litigation and regulation as opposed to alternative strategies built around ecosystem service provision. The Article focuses on three service provision problems: (1) the geographic scale of the ecosystem, (2) the pros and cons of using ESA litigation as a catalyst to force change, and (3) the problems posed by the existence of entrenched entitlements. It concludes that the Klamath requires both voluntary and mandatory land and water use practices which restore and conserve some measure of the traditional ecosystem services⁵⁶ that watersheds long provided before they were degraded through intensive development and commodity production. However, to date, the Klamath story only explains why ecosystem service provision institutions do not emerge while partial, patchy regulatory ecosystem conservation experiments do.

52. PACIFIC POWER, KEEPING YOU INFORMED: UPDATE ON PACIFIC POWER RATE INCREASE REQUEST (May 9, 2006), available at <http://www.pacificpower.net/File/File65387.pdf>. The decisions were upheld by the California and Oregon public utilities commissions. Proposed Decision, California PUC Docket No. 105-11-022, November 13, 2006, and Oregon Public Utility Commission Docket No. UE-170, Order No. 06-172, April 12, 2006.

53. In 2000, potato farmers elected not to plant because they could not compete with Idaho growers and world markets. Wendell Wood, *We Should Stop Blaming Species for Problems and Seek Real Solutions*, KLAMATH FALLS HERALD AND NEWS, Apr. 23, 2001. The Director of the Oregon Department of Agriculture expressed similar fears about the state's agricultural sectors that refuse to adapt to increased national and international competition. Kathy Coba, *The First Year in Review, Address at the Eastern Oregon Forum* (Feb. 11, 2004), available at http://egov.oregon.gov/ODA/do_speech_040211.shtml.

54. John M. Melack et al., *Effects of Climate Change on Inland Waters of the Pacific Coastal Mountains and Western Great Basin of North America*, 11 HYDROLOGICAL PROCESSES 971, 973 (1997).

55. John Driscoll, *Klamath Confluence*, EUREKA TIMES-STANDARD, May 22, 2006, available at <http://www.klamathforestalliance.org/Newsarticles/newsarticle20060522.html>.

56. See James Salzman, *Creating Markets for Ecosystem Services*, 80 N.Y.U. L. REV. 870 (2005).

Those trying to design more successful service provision experiments will have to work harder at overcoming the barriers found in the Klamath and many other basins.

II. ECOSYSTEM SERVICE PROVISION: THE WAY OF THE FUTURE?

A. *The Ecosystem Service Idea*

The scientific construct of the ecosystem is ecology's most important contribution to environmental protection, but it has proved difficult to implement the teachings of ecology in part because ecology continually evolves. The original idea that natural systems should be walled off to the maximum extent possible from human intrusion to conserve their inherent stability has given way to a more complicated understanding of ecosystems as dynamic systems responding to stresses and changing over time. Modern ecology now views ecosystems as dynamic, complex systems continually adapting to change and stress.⁵⁷ Ecosystems are neither stable nor chaotic, but continue to evolve at different rates over different spacial scales. The rate of change is not continuous, and systems can display equilibria states for long periods of time but then collapse, and cascading change can occur.⁵⁸

This vision has sparked a debate about whether society should actively and adaptively manage ecosystems for their functions or services or some combination of both. Ecosystem function and services are related but are analytically different. Ecosystem function refers to the various physical processes that ecosystems perform. Ecosystem services refers to those functions that provide concrete, monetizable benefits to human welfare.⁵⁹ However, in practice, the line between function and service is hazy, especially since we tend to address the issue of ecosystem conservation through imperfect proxies that do not make a clear function-service distinction.

The focus on the role that ecosystems play in providing useful

57. See C.F. Hollings & Lance H. Gunderson, *In Quest of a Theory of Adaptive Change*, in PANARCHY: UNDERSTANDING TRANSFORMATIONS IN HUMAN AND NATURAL SYSTEMS 1-23 (Lance H. Gunderson & C.S. Holling eds., 2002) (discussing a series of ecosystem changes).

58. C.F. Hollings et al., *Sustainability and Panarchies*, in PANARCHY: UNDERSTANDING TRANSFORMATIONS IN HUMAN AND NATURAL SYSTEMS 72-77 (2002).

59. The Millennium Ecosystem Assessment, for example, posits four categories of services: (1) the provision of food and water, (2) the regulation or prevention of adverse impacts such as disease, (3) support for other production activities, and (4) cultural services such as recreation. MILLENNIUM ECOSYSTEM ASSESSMENT, LIVING BEYOND OUR MEANS: NATURAL ASSETS AND HUMAN WELL-BEING 7 (2005) [hereinafter LIVING BEYOND OUR MEANS], available at <http://www.millenniumassessment.org/documents/document.429.aspx.pdf>.

services to humans reflects two powerful recent trends. First, the emphasis on lost ecosystem services reflects the rise of biodiversity as an organizing concept for a variety of uncoordinated resource management objectives.⁶⁰ Biodiversity conservation requires that ecosystems be viewed as a functioning unit rather than a discrete collection of species. Put differently, all species and the natural processes that support them are potentially equally important.⁶¹ Second, the ultra-utilitarian rationale for ecosystem and biodiversity protection reflects the capture of much of the environmental policy discourse by science and welfare economics.⁶²

This said, the question becomes: Does ecosystem service provision offer positive advantages in areas such as the Klamath compared to the current litigation-regulation strategies that are being followed?⁶³ Much energy has been devoted to the development of environmental ethics, but the strongest case for environmental protection remains the ability to show that protection can be justified by hard numbers.⁶⁴ Science-based, utilitarian solutions have the potential to appeal to a wide variety of interests. They are less polarizing than appeals to higher spiritual and aesthetic values. Despite heroic efforts to create a workable system of environmental ethics that encompasses non-humans, environmental protection remains relentlessly anthropocentric. It is also harder to argue against a policy with dollar values attached. Finally, because ecosystem service provision is either tied to a market or to government subsidies, it can be a fair and equitable way of reallocating resources. The problem has been to apply these diverse rationales from concept to the working landscape.

The ultimate issue in the Klamath is whether it is possible to move to an alternative, sustainable landscape with a mix of agriculture and the enhanced maintenance and restoration⁶⁵ of impor-

60. See DAVID TAKACS, *THE IDEA OF BIODIVERSITY: PHILOSOPHIES OF PARADISE* (Johns Hopkins Univ. Press 1996), for an informative history of the construction of the term. A recent United Nations report links biodiversity conservation and ecosystem services. *LIVING BEYOND OUR MEANS*, *supra* note 59, at 12.

61. For a masterful analysis of the unanswered scientific questions that the construct raises, see Fred Bosselman, *A Dozen Biodiversity Puzzles*, 12 N.Y.U. ENVTL. L. J. 364 (2004)

62. For the best example of this capture, see *LIVING BEYOND OUR MEANS*, *supra* note 59.

63. There are, of course, risks to this approach. See Dale Goble, *What are Slugs Good for? Ecosystem Services and the Conservation of Biodiversity*, 22 J. LAND USE & ENVTL. L. 415 (2007), (cautioning against shifting the focus from the scientific, non-utilitarian ethical concern with ecosystem function to the relentlessly utilitarian focus on ecosystem service provision).

64. See *Science, Judgment, and Controversy*, *supra* note 30. The counter position is well-articulated by Professor Mark Sagoff, *Price, Principle, and the Environment* 135-144 (2004)

65. The need to focus on restoration strategies is forcefully argued in Debra Donahue *Federal Rangeland Policy: Perverting Law and Jeopardizing Ecosystem Services*, 22 J. LAND

tant ecosystem functions and services. One solution is a mix of induced and mandated conservation practices combined with the “post-modern” concept of ecosystem service markets. Federal and state requirements dealing with pollution control and resource conservation could work together toward that goal supplemented by NGO participation. However, there has been little consideration of the quantification and commodification of ecosystem services as a long term solution in the Klamath. There are many sincere and hopeful peacemakers at work, but the focus remains on maintaining the traditional white irrigation culture to the maximum extent possible.

B. From Theory to Action: Some Hard Questions

The Klamath illustrates three of the central meta problems with efforts to shift traditional resource exploitation-environmental protection debates to ecosystem services conservation options. First, the resource exploitation legacy of the nineteenth and twentieth centuries stack the deck in favor of the preservation of the status quo.⁶⁶ Second, the use of a single powerful law such as the ESA to change the status quo can, perversely, shift the focus from ecosystem function and service conservation to adoption of only minimal mitigation measures to save a species from extinction or to push the problem forward a few years. Third, the Klamath is, in effect, a heritage area. The benefits of ecosystem service generation are national, if not global. However, the public and private service providers are disconnected from the beneficiaries.

To overcome these barriers, three hard problems which often arise when one tries to develop a landscape strategy for an area that restores a level of lost ecosystem services must be addressed.⁶⁷

USE & ENVTL. L. 301 (2007).

66. The reasons include the existence of entrenched property rights and cultural attitudes that discourage interest in new, cooperative management schemes, especially where endangered species are present. See Christopher S. Elmendorf, *Ideas, Incentives, Gifts, and Governance: Toward Conservation Stewardship of Private Land*, in *Cultural and Psychological Perspective*, 2003 U. ILL. L. REV. 423 (2003).

67. This Article does not address the question of the optimal institutional mix to provide ecosystem services. Since Secretary Bruce Babbitt's tenure as Secretary of the Interior, there has been a movement to solve ecosystem problems by ad hoc public-private stakeholder processes. Professors Jody Freeman and Daniel A. Farber call this development modular regulation. Jody Freeman & Daniel A. Farber, *Modular Environmental Regulation*, 54 DUKE L.J. 795 (2005). For a more skeptical but ultimately hopeful view see Peter M. Lavigne, *The Movement for American Ecosystem Restoration and Interactive Environmental Decisionmaking: Quagmire, Diversion, or Our Last, Best Hope?*, 17 TUL. ENVTL. L.J. 1 (2003).

(1) What is the geographic extent of the ecosystem and how does its scope and scale impact the incentives and disincentives to provide ecosystem services? The Klamath's two basins create a great disparity between those who enjoy ecosystem benefits and those with the power to degrade them.

(2) Do environmental and resource management laws help or hinder efforts to make ecosystem provision an integral part of a landscape conservation plan? For example, the ESA has been hailed as having the power to induce long term changes in public and private behavior. The Klamath experience, however, suggests that the focus on listed species widens the disconnect between the ESA and existing state water law entitlements. Because the reallocation of water is vital to ecosystem service provision, the limited ability of the Act to change long-established water allocation patterns is troubling.

(3) Is a "Coasian" solution always possible or must there be a reassignment of property rights? The widespread assumption in the ecosystem service literature is that equity and efficiency counsel "bribing" existing entitlement holders to provide the necessary services.⁶⁸ In the Klamath Basin, the law of prior appropriation and federal reclamation stack the deck in favor of irrigators and against either existing ecosystem service providers or the emergence of new ones,⁶⁹ thus effectively shifting the cost of water conservation to federal tax payers. Put differently, there is a potential moral hazard problem. The law rewards, rather than penalizes, resource use patterns with high social costs.

III. GEOGRAPHICAL SCALE MATTERS

A. *The Physical Features of the Klamath Basin*

Before the service provision issues can be addressed, the "prob-

68. See *infra* note 110 and accompanying text for a discussion of this issue.

69. *Fish, Farms, and the Clash*, *supra* note 3, at 339-40.

lemshed” must be delineated. The geographic scale of the ecosystem influences the barriers and incentives to service provision. For aquatic ecosystem problems, the river basin is the presumptive geographic area. However, the practice of good geography may only exacerbate the problem. The presumption holds in the Klamath, although the Basin is actually two equally sized sub-basins each with a different geography, culture, and economy. Nature flipped the usual pattern; the Upper Basin is relatively flat and dry and the Lower steep and wet. The Klamath watershed covers a vast, sparsely populated, remote region in south central Oregon and extreme northern California.⁷⁰ This area is much poorer than the urban and exurban areas of these two prime examples of successful post-industrial states.⁷¹ The river originates in Upper Klamath Lake, a broad, shallow lake fed by snow melt from the Cascade Mountains of Oregon, and flows through the Trinity Alps of California, where the Scott, Trinity, and Salmon Rivers join it, before it reaches the Pacific Ocean at the Redwood National Park.⁷²

The Upper Basin, often referred to simply as the Klamath Basin, is the site of the conflicts of 2001.⁷³ It spans across the California-Oregon border⁷⁴ and has long been dedicated to irrigated agriculture—primarily potatoes, specialty crops and hay.⁷⁵ It includes high peaks in the Cascade Mountains that receive more than forty inches of precipitation annually.⁷⁶ But, “its dominant feature is a flat, agricultural valley lying just west of the ridge that marks the beginning of the forbiddingly arid Great Basin.”⁷⁷ Only about eleven inches of rain fall in the valley each year, making it nearly a desert, and water demand exceeds supply about seven out of every ten years.⁷⁸ Agriculture is made even more challenging by the area’s high elevation and short growing season. Because of the severe climatic conditions, none of the lands in the region fall in the U.S. Department of Agriculture’s highest productivity class (Class D).⁷⁹

The Lower Klamath Basin, lying entirely in California, is

70. *Id.* at 289.

71. *Fish, Farms, and the Clash*, *supra* note 3, at 295.

72. *Id.* at 289.

73. *Id.* at 291.

74. *Id.*

75. *Id.* at 299.

76. *Id.* at 291.

77. *Fish, Farms, and the Clash*, *supra* note 3, at 291.

78. Agriculture is the only important consumptive use of water in the Basin, accounting for more than 95 percent of the consumptive use. See BR FINAL 2002 BIOLOGICAL ASSESSMENT, *supra* note 38, at 25.

79. Carlson, *supra* note 44, at 156.

dominated by timber-covered slopes and mountainous wilderness areas.⁸⁰ The Lower Klamath River and its tributaries were once teeming with Coho and Chinook Salmon,⁸¹ allowing the Indians along the river to harvest a million pounds annually.⁸² Wild Chinook are considered superior to farm-raised salmon because of its taste and heart-healthy oils. Like many headwaters areas, the Upper Basin was able to put the waters to beneficial use before other claims emerged, thereby exporting some of the external costs of this allocation downstream. Salmon runs are threatened by the lack of water and other non-anthropocentric factors.⁸³

Commercial harvest began in the early 1800s and continued until the mid-1990s, when the severely declining Coho fisheries were essentially closed.⁸⁴ Coho populations fell from a range of 50,000 to 125,000 in the 1940s to 6,000 fish in 1996.⁸⁵ Recreational harvest of Coho Salmon in the Klamath River and its tributaries continued until the Coho were listed under the federal ESA in 1997. A small tribal Coho harvest, affecting about seventy naturally spawning fish per year, remains.⁸⁶ Salmon conditions have deteriorated since 2001. There was a major die off in 2002,⁸⁷ and in 2006 the anticipation of low Klamath fall Chinook runs resulted in sharp reduction in the allowable catch of the Pacific Coast salmon fishery in Oregon and California.⁸⁸

B. *The Geography of Interests*

The ability of upstream irrigators to shift costs downstream

80. *Fish, Farms, and the Clash*, *supra* note 3, at 289.

81. *Id.* The Klamath Basin was “the third most important salmon producing river system in the nation, producing an estimated 660,000 to 1,100,000 million [sic] adult fish annually.” *Water Management and Endangered Species Issues in the Klamath Basin: Oversight Field Hearing Before the H. Comm. On Resources*, 107th Cong. 123 (2001) (statement of William F. “Zeke” Grader, Jr., Executive Director, Pacific Coast Federation of Fishermen’s Associations).

82. BALANCING WATER, *supra* note 5, at 35.

83. ENDANGERED AND THREATENED FISHES, *supra* note 37, at 102-22.

84. Threatened Status for Southern Oregon / Northern California Coast Evolutionarily Significant Unit (ESU) of Coho Salmon, 62 Fed. Reg. 24588, 24593-94 (May 6, 1997). NMFS regulations allow incidental take of Coho in Chinook-directed fisheries off California consistent with Pacific Fishery Management Council regulations. See 50 C.F.R. § 223.204. Coho are not to be retained, but are impacted by “hook and release.” NAT’L MARINE FISHERIES SVC., BIOLOGICAL OPINION: KLAMATH PROJECT OPERATIONS 29 (May 31, 2002) [hereinafter NMFS 2002 BiOP] available at <http://swr.nmfs.noaa.gov/psd/Klamath/KpopBO2002finalMay31.pdf>.

85. Mary Christina Wood, *Restoring the Abundant Trust: Tribal Litigation in Pacific Northwest Salmon Recovery*, 36 ELR NEWS & ANALYSIS 10163, 10164 (2006).

86. NMFS 2002 BiOP, *supra* note 84, at 29.

87. *Fish, Farms, and the Clash*, *supra* note 3, at 335.

88. Fisheries Off West Coast States; West Coast Salmon Fisheries; 2006 Management Measure and a Temporary Rule, 71 Fed. Reg. 26254-66 (May 4, 2006).

illustrates the problem with moving toward an ecosystem services provision remedy when the most immediate beneficiaries of ecosystem services are located far from the origin of the service. Upper Basin irrigators have no incentive to provide the services unless compelled by the ESA, and downstream fishing communities have no incentive to share the cost of service provision. Shallow upper Klamath Lake is the irrigator carry-over storage reservoir, but there is little reserve water to release in a drought. Therefore, at least in the eyes of the lower basin, the geography of the Klamath creates two classes of parties: “tortfeasors” and “victims.”⁸⁹ The “tortfeasors” are the Klamath irrigators, who have shifted the external costs of irrigation downstream, and the “victims” are downstream tribes as well as commercial and recreational salmon fisherman, since lowered flows impair salmon runs. This perception creates an incentive for “victims” to rely on litigation-regulatory solutions: full enforcement of the ESA, which in effect shifts the provision burdens back to the upstream irrigators who try to shift it to the federal tax payers.⁹⁰ Either irrigation deliveries must be cut or a federally financed water bank must provide the necessary water.⁹¹ The next section addresses the potential of the ESA to overcome these barriers.

IV. THE PROS AND CONS OF UNLEASHING THE ESA PIT BULL

A. The Catalyst Theory of the ESA

Three decades ago, Professor George Coggins described the

89. I am not asserting that upper stream irrigators are necessarily liable under common law tort doctrines such as nuisance. These issues are fully addressed in J.B. Ruhl, *The “Background Principles” of Natural Capital and Ecosystem Services — Did Lucas Open Pandora’s Box?*, 22 J. LAND USE & EVNTL. L. 527 (2007). I am borrowing the analysis developed by Judge Guido Calabresi, illustrating that the fault system makes liability decisions on an “all-or-nothing basis” and makes it difficult to allocate costs efficiently. GUIDO CALABRESI, *THE COSTS OF ACCIDENTS: A LEGAL AND ECONOMIC ANALYSIS* 239-43 (Yale Univ. Press 1970).

90. Both irrigators and fisherman have received emergency relief. The Oregon Natural Resources Council put the 2001 disaster relief for the irrigators at \$48,625,000.00. JAMES MCCARTHY, OREGON NATURAL RESOURCES COUNCIL, *CRISIS PROFITEERING: INEQUITIES AND EXCESSES OF KLAMATH PROJECT BAILOUT* (2001), available at <http://www.klamathbasin.info/CrisisProfiteering.pdf>. After the virtual closure of the 2006 Pacific fishing season, fishermen demanded \$81 million, but Congress only authorized the release of \$2 million from a NOAA emergency fund. David Whitney, *House OKs \$2 Million in Disaster Aid for Salmon Fleet*, SACRAMENTO BEE, June 29, 2006, at A3.

91. Starting in 2002, the Bureau of Reclamation created a water bank in the Upper Basin to meet downstream flow obligations. Sufficient water was provided but the Bureau cannot quantify the actual impacts. UNITED STATES GOVERNMENT ACCOUNTABILITY OFFICE (GAO), *KLAMATH RIVER BASIN: RECLAMATION MET ITS WATER BANK OBLIGATIONS, BUT INFORMATION PROVIDED TO WATER BANK STAKEHOLDERS COULD BE IMPROVED* (March 2005) [hereinafter GAO].

ESA as “one of the few nearly absolute standards governing management of the American natural legacy.”⁹² Among environmental statutes, the ESA is relatively unique because it contains substantive as well as procedural mandates. In practice, the ESA is much less draconian than its friends and opponents portray it. The two agencies that administer the ESA have turned it into a more user-friendly development permit program. In the majority of cases the focus is on mitigation and the use of habitat conservation plans to allow the killing of a percentage of listed species. Nonetheless, proponents of species protection and ecosystem conservation support the use of aggressive ESA litigation as a catalyst to trigger more comprehensive long range solutions. One strategy is to trigger the Section 7 consultation process in the hopes that stringent enforcement (or the threat of it) will produce a better result for the species and its habitat ecosystem.⁹³ Federal agencies who propose actions that may place listed species at risk must consult with either the FWS or the NMFS. These agencies issue a Biological Opinion (BiOp), which determines whether the action poses a risk to a listed species and outlines the necessary avoidance measures. An unfavorable BiOp, such as the 2001 Klamath BiOp, triggers the duty to ensure that the action “is not likely to jeopardize the continued existence” of the species.⁹⁴

There are two ecosystem service justifications for ESA catalyst or “rule of law” litigation, that the use of litigation to create a crisis that will produce a long run solution for the ecosystem.⁹⁵ First, it can target the optimal or most efficient service provider. Second, if you adopt the “tortfeasor”-“victim” approach, the ESA can trigger solutions that are fair, that go beyond the narrow mandates of the statute, and that are systemwide. The Klamath Project irrigators may be the cheapest cost avoiders because they can cut back production in water during short years and take other adaptive measures.⁹⁶ Neither salmon nor Indian fishermen have the same range

92. George Cameron Coggins & Irma S. Russell, *Beyond Shooting Snail Darters in Pork Barrels: Endangered Species and Land Use in America*, 70 GEO. L.J. 1433,1435 (1982).

93. 16 U.S.C. § 1536(b).

94. 16 U.S.C. § 1536(a)(2).

95. The environmental movement began in large part as a legal guerilla movement and non-governmental organizations pursued the strategy of asking courts to construct strict statutes that imposed substantive and procedural duties that could be characterized as environmental. See generally A. Dan Tarlock, *The Future of “Rule of Law” Litigation*, 19 PACE ENVTL. L. REV. 575 (2002).

96. In the United States, we still view natural disasters such as drought as beyond the control of the victims and thus worthy of government relief. Australia has started, with some backsliding in the severe drought that began in this century, on a different course. Australian drought policy is premised on the assumption that drought is an expected occurrence in the world’s driest climate and thus farmers should take proactive steps to anticipate it and to mitigate the risks. See BEYOND DROUGHT: PEOPLE, POLICY AND PERSPECTIVES

of avoidance options. Putting the service provision cost on irrigators can also be characterized as an example of the “polluter pays” principle at work. For years, the irrigators were able to shift the external costs of their water use to others, so it is only fair that they now internalize a portion of these costs.

The fear of strict enforcement has triggered some very creative solutions, such as multi-species habitat conservation plans in which the burdens of species conservation are widely shared between public and private providers.⁹⁷ However, in the Klamath, the ESA has frustrated efforts to develop a basin-wide solution in the Upper Basin by focusing on only one class of tortfeasors—the federal irrigators. Without a federal nexus, all irrigation operations can only be addressed through section 9, which prohibits any person from “taking” a listed species.⁹⁸ Enforcement would require FWS or NMFS to prove that the actions of a specific entity (an individual farmer or irrigation district) caused the take of a listed fish—a showing that can be difficult to make. In contrast, the use of the Section 7 procedure makes it much easier to look to Project irrigators than to non-Project irrigators to bear the costs of protecting the endangered fish. However, it is easy to see why Project irrigators (and the agency that serves them—the Bureau) would feel unfairly targeted by any increased burdens in light of a century of undisturbed access to water. The result in the Klamath has been BiOps that leave protection of the listed species in doubt because of reluctance to impose inequitable burdens on Project irrigators.

In short, the catalyst theory does not appear to have yet worked in the Klamath despite many good faith efforts to make it happen. Writing after the drought summer of 2001, Professor Holly Doremus and I concluded:

The Klamath experience . . . confirms the disconnect

(2003).

97. The habitat conservation plan process remains controversial and there are many problems with it. My point is only that fear of ESA enforcement provided the incentive for ecosystem conservation experiments that go far beyond the requirements of the ESA. Compare Lindell Marsh, *Conservation Planning Under the Endangered Species Act: A New Paradigm for Conserving Biodiversity*, 8 TUL. ENVTL. L.J. 97 (1994), and Marc Ebbin, *Is the Southern California Approach to Conservation Succeeding?*, 24 ECOLOGY L.Q. 695 (1997), and Jody Freeman, *The Private Role in Public Governance*, 75 N.Y.U. L. REV. 543 (2000), and A. Dan Tarlock, THE DYNAMIC URBAN LANDSCAPE IN THE ENDANGERED SPECIES ACT AT 30 127 (2006), with Shi-Ling Hsu, *The Potential and Pitfalls of Habitat Conservation Planning Under the Endangered Species Act*, 29 ENVTL. L. REP. 10592 (1999), and Karen Sheldon, *Habitat Conservation Planning: Addressing the Achilles Heel of the Endangered Species Act*, 6 N.Y.U. ENVTL. L.J. 279 (1998).

98. A taking includes habitat modification, *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon*, 515 U.S. 687 (1995), including water withdrawals. *United States v. Glenn-Colusa Irrigation Dist.*, 788 F. Supp. 1126, 1133 (E.D. Cal. 1992).

between the ESA and state water law, and the Act's limited ability to change long-established water allocation patterns. The NMFS 2002 Biological Opinion makes a commendable stab at broadening the vision of responsibility for improving the Klamath's ecological condition by calling for initiation of a state/federal process to identify non-project water that could contribute to flows needed by the coho. But that effort, which does not go nearly as far as is needed, seems doomed to failure unless the state chooses to cooperate. The Bureau, the target of NMFS' requirement, has no authority to demand state, or even other federal agency, participation in any such process, much less to demand any particular substantive outcome.

To date the Klamath experience suggests that, at best, the ESA is an uneven, weak catalyst. In Oregon, resistance to those changes continues. In the spring of 2002, a coalition of environmental groups submitted a petition asking the Oregon Water Resources Commission to place a moratorium on new appropriations on the Klamath and Lost Rivers. Given the recent water conflicts in the basin, the ongoing adjudication, and the fact that no new flow appropriations have been granted since 1997, that seemed a relatively mild request. The Commission, however, with the support of the agricultural community, rejected the petition.⁹⁹

B. Counter-Culture Reactions

Subsequent events have largely tended to confirm our analysis and to reveal a number of specific problems with catalyst litigation. Four developments stand out. The first is a hardening of the position by those who want to maintain the status quo and a consequent unwillingness to compromise. The second, which is a symptom of the first, is the use of a counter catalyst. The third is that the focus on legal and regulatory solutions create disincentives to seek alternative, longer-lasting solutions to the problem. The final development is the ease with which strict enforcement of the ESA can be avoided. This problem is discussed in Section V of this Article. This Section focuses on the second and third prob-

99. *Fish, Farms, and the Clash*, *supra* note 3, at 348-49 (citations omitted).

lems.

Rule of law litigation is a game that anyone can play, and the Klamath irrigators, emboldened by a Supreme Court decision that allowed them to challenge Biological Opinions¹⁰⁰ and the 2002-2003 National Research Council Reports, tried to land a knock-out punch. To wipe out the successful ESA cases which held that the existence of vested state water rights was not a defense to compliance with the ESA, the irrigators tried to ride the current property rights wave and brought a Court of Claims Fifth Amendment takings suit for more than a billion dollars.¹⁰¹ However, this move did not succeed. The court found that the federal government had appropriated all of the non-appropriated waters in the basin for the Project and that the individual farmers only had contract rights, rather than property rights. It refused to follow an earlier case¹⁰² that had found a physical taking.¹⁰³ Specifically, the court noted that many Reclamation contracts, including those in the Klamath, absolved the government of liability for “water shortages—hydrologic, regulatory, or hybrid—that may occur within the system.”¹⁰⁴ It also suggested that even if the contracts did not specifically provide for delivery interruptions, the ESA could be characterized as a sovereign act which overrode the Bureau’s Reclamation Act duties. The court remanded for proceedings on contract claims, but the court again ruled against the irrigators.¹⁰⁵

The third reason recognizes that the regulatory system offers such powerful advantages to both sides and thus crowds out the search for alternative solutions. In a recent paper, a group of researchers studied the failure of a voluntary watershed planning process, cemented by compliance social norms rather than legal duties, to emerge on the an Illinois river. Building on the foundation work of Elinor Ostrom, which challenges the assumption that private commons management is always tragic,¹⁰⁶ they concluded that the enforcement or threat of enforcement of stringent resource

100. *Bennett v. Spear*, 520 U.S. 154, 176 (1997). In holding that the ESA citizen suit provisions applied to opponents of species conservation, Justice Scalia unilaterally rewrote the legislative history of the ESA with his incredible statement that the primary purpose of the Act was “to avoid needless economic dislocation produced by agency officials zealously but unintelligently pursuing their environmental objectives.” *Id.* at 176-77.

101. *Klamath Irrigation Dist. v. U.S. Pac. Coast Fed’n of Fishermen’s Ass’ns*, 67 F.Cl. 504 (2005).

102. *Tulare Lake Basin Water Storage Dist. v. United States*, 49 Fed.Cl. 313, 317 (2001).

103. *Klamath Irrigation Dist.*, 67 Fed. Cl. at 537.

104. *Id.* at 535 (quoting Brian Gray, *The Property Right in Water*, 9 HASTINGS W.-NW. J. ENVTL. L. & POL’Y 1, 26 (2002)).

105. *Klamath Irrigation Dist. v. United States*, 75 Fed. Cl. 677 (2007)

106. See generally ELINOR OSTROM, *GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION* (1990).

management laws can crowd out other regimes by transferring power to progressively higher levels:

Underneath and alongside . . . formal governing bodies, numerous formal and informal institutions of “civil society,” ranging from state-chartered corporations and organizations to customary associations and social orderings have more-or-less formalized rules governing their behaviors. In a locality such as the Cache, where many individuals live within widely ramifying sets of kin and other long-standing, multi-generational relations, these informal governing rules often override formal laws. The overlapping jurisdictions of formal and informal institutions create a governing terrain in which “custom” can be as significant as formal procedures.¹⁰⁷

It may nonetheless be premature to write off the catalyst theory. Despite the Bush Administration’s efforts to defang the ESA, it retains vigor. Downstream fishermen have been able to use the ESA to successfully challenge the Bush Administration’s efforts to push forward all serious compliance with Biological Opinions that require water cutoffs.¹⁰⁸ In 2006, a federal district court held that the Bureau of Reclamation had to release water, at the expense of the project, to support threatened Coho in the Lower Basin.¹⁰⁹

107. Adams, Jane et al., *Watershed Planning: Pseudo-democracy and its Alternatives — The Case of the Cache River Watershed, Illinois*, 22 AGRIC. AND HUMAN VALUES 327, 332 (2005).

108. See *infra* notes 168-81 and accompanying text.

109. *Pac. Coast Fed’n of Fishermen’s Ass’ns v. U.S. Bureau of Reclamation*, 2006 WL 798920 (N.D. Cal. 2006). The Ninth Circuit had previously held that the Bureau’s release plan (or non-plan) was arbitrary. *Pac. Coast Fed’n of Fishermen’s Ass’ns v. U.S. Bureau of Reclamation*, 426 F.3d 1082 (9th Cir. 2005). The Bureau practically guaranteed the result by adopting a Biological Opinion in 2002 which phased in downstream protection over ten years and delayed the provision of the full amount of water necessary to protect the Coho until year nine. BR FINAL 2002 BIOLOGICAL ASSESSMENT, *supra* note 39. The court easily found that the BiOp failed to analyze adequately the impact of the effect of the delay on the Coho in years one through eight. *Pac. Coast Fed’n of Fishermen’s Ass’ns*, 426 F.3d at 1090. In short, it carried its own “death wound” by adopting policies that it could not support with credible science. The injunction was upheld in *Pac. Coast Fed’n of Fishermen’s Ass’ns v. U.S. Bureau of Reclamation*, 226 Fed. Appx. 715 (9th Cir. 2007). The years of litigation that led to this decision are set out in Wood, *supra* note 53.

V. COASE IN THE KLAMATH OR PROPERTY RIGHTS ASSIGNMENTS
ALSO MATTER

A. The Necessity for Property Rights

Ecosystem services require the creation of new property rights. The Klamath is an ecosystem in which long-established property rights, primarily water rights, reenforce resistance to fundamental change. This Section addresses the question of how existing property rights can facilitate or hinder the necessary changes in the system. In theory, the existence of entrenched property rights is no stranger to efficient change. Ronald Coase received the Nobel Prize in economics for his article *The Problem of Social Cost*.¹¹⁰ Coase's theorem posits that, absent transaction costs, parties will bargain toward an efficient allocation of resources regardless of the initial allocation of property rights. Critics have long pointed out that a world of zero or minimal transaction costs seldom exists and that the initial assignment of rights can strongly influence the reallocation options. This section argues that when private providers are involved, the level of service provision, if any, is a partial function of the property entitlement claimed by the presumptive provider. The more entrenched the initial entitlement, the more pressure there will be for both forced reallocations and bribes.¹¹¹ Proponents of a Coasian solution must take full account of the loss of power and self-esteem that all change, forced or compensated, brings. The situation for public providers is different; public ownership often carries with it the discretion, but seldom the duty, to dedicate land and water to ecosystem provision. Thus, the result is often the same: the under-provision of ecosystem services because of the power of entrenched private entitlements and expectations that public resources will be dedicated to commodity production.

A necessary condition for the provision of ecosystem services is the existence of a defined, consistent provider. Proponents of service provision would prefer that a beneficiary also be identified and that the two be linked through markets. However, providers can provide services as a bi-product of other activities either because they are forced to or because they are bribed to so. Thus, the class of beneficiaries can be an identifiable group or society at large. Once the provider is identified, the question turns to the relationship between property rights and ecosystem service provision. The

110. Ronald Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960).

111. I use "bribe" in the classic economics sense: a person changes his or her behavior in response to a legal payment of money.

root of the problem is that the relationship is often negative because private entitlements are difficult to modify even when money may be available to do so.

B. Property Rights in the Klamath: Entrenched Entitlements Resist Change

Western national resources law has a fundamental bias toward resource exploitation, and the legislative process has generally operated, at least until recently, to reinforce the expectation that there will be few limits on exploitation. Western water law is a prime example, as it is a product of the legacy of late Roman legal thought. The modern notion of property remains rooted in the Roman notion of exclusive dominion subject only to the duty not to cause a nuisance. For example, this view lies behind the Supreme Court's dismissal of the argument that the purchaser of highly regulated wetland property assumes the risk of a development denial with the quip that "[T]he State may not put so potent a Hobbesian stick into the Lockean bundle."¹¹² Locke himself might be surprised that his labor theory has now incorporated the Roman right of *ius abutendi*, the right to destroy property. Both the common law and the police power temper this discretion, but this legacy has made it much harder to limit activities that degrade ecosystems as opposed to the limitation of air, soil, and water as waste disposal sinks.

The combination of legal entitlements backed by the political process is at work in the Klamath to maintain the status quo. The irrigators, supported by the Bureau of Reclamation, claim the right to apply water without regard to the environmental costs. They rely on the doctrine of prior appropriation, which is a practical, intuitive response to the seasonable unreliability of western water supplies. Miners developed the custom of allocating rights by priority rather than trying to use the vague equal sharing rules of the common law of riparian rights. Courts sanctioned this custom as an acceptable risk distribution scheme for the arid west,¹¹³ but the

112. *Palazzolo v. Rhode Island*, 533 U.S. 606, 627 (2001). Professor J.B. Ruhl partially disagrees with this analysis and argues that the common law has the potential to adapt over a long period of time to recognize a duty of ecosystem provision. J.B. RUHL, STEVEN E. KRAFT & CHRISTOPHER L. LANT, *THE LAW AND POLICY OF ECOSYSTEM SERVICES*, 266-271 (2007). See *Palazzollo v. Rhode Island*, 2005 WL 1645974 (R.I. Super. 2006), the Supreme Court's decision on remand, which held that the state could deny the permit because draining and filling would be a nuisance.

113. For example, at a time when the public use doctrine limited the exercise of the power of eminent domain to property which would be used by the public, the Supreme Court upheld a Utah statute allowing appropriators to condemn ditch right of ways across private lands because of "some peculiar condition of the soil or climate, or other peculiarity of the

rhetoric of Western water law has obscured the high level of risks inherent in prior appropriation and instead has stressed the illusory firmness of water rights. The Reclamation Era was premised on the expectation that federal government would eliminate most risk or recurring periods of drought and highly variable rainfall patterns by carry-over storage. Dams and reservoirs reduced but did not eliminate risk. Because risk is inherent in water entitlements, there should be no inherent legal barriers to management solutions that equitably reassign the risks of water shortages to accommodate all relevant uses and stakeholders in a basin and enhance the provision of ecosystem services.¹¹⁴ The federal reclamation program's construction of carry-over storage reservoirs to back-stop water rights—not the law—is the main reason that water rights are relatively firm regardless of the water year. Thus, it has proved very difficult to add new risks to Western water rights.

C. Ecosystem Service Property Rights

There are three counter strategies to the drag of existing entitlements: (1) environmental group property rights, (2) forced reallocation through the ESA, and (3) bribes.

1. Public and Group Environmental Property Rights

Two federal property rights exist in the Klamath that could potentially be dedicated to ecosystem provision and offset the effects of irrigation. Both the Upper Basin's wildlife refuges and the Klamath Tribe can claim water rights that can be dedicated to service provision, but the potential of these rights to provide consistent long term, ecosystem services is limited. Due to the fact that western settlement preceded effective federal control over the pub-

state" *Clark v. Nash*, 198 U.S. 361, 368 (1905).

114. The California Supreme Court has recently sanctioned a new risk-based law of flood control liability. *Bunch v. Coachella Valley Water District*, 63 Cal. Rptr. 2d 89 (1997), holds that a public entity which diverts water from a natural watercourse that has historically flooded adjacent lands and constructs flood control works that fail in a major rain event is only liable if it acted unreasonably in designing, constructing and operating the project.

[T]he only way to determine whether a damaged private landowner has . . . been forced to contribute a compensable "disproportionate" share of the public undertaking is to determine whether the system, as designed, constructed, and operated and maintained, exposed him to an "unreasonable" risk of harm, either individually or in relation to other landowners.

Id. at 100-01.

lic domain, states gained the power to allocate water in the west and have long claimed that this historical accident excludes federal control. There is no constitutional basis for this claim; it rests entirely on Congressional forbearance and this has been eroded over time.¹¹⁵

Three twentieth century historical moments have restored a measure of federal power under the Commerce and Property powers: the conservation movement, tribal sovereignty, and the environmental movement. First, the conservation era first produced a special class of federal water rights for Indian tribes and public land withdrawals. These are mixed riparian and appropriative rights. A federal reserved right has a priority date, but unlike an appropriative right, it need not be put to beneficial use to be perfected. Like a riparian right, it can be claimed at any time and can encompass ecosystem conservation, at least for the maintenance or revival of historic fisheries. But federal claims remain limited in scope and quantity and are seldom robust enough to support the desired range of ecosystem services.

Until the 1963 decision in *Arizona v. California*,¹¹⁶ Westerners assumed that only Indians had federal water rights. In the epic litigation to divide the Lower Colorado River, the Supreme Court held that the federal government can claim non-Indian federal reserved rights to fulfill the purposes of a public land withdrawal.¹¹⁷ *Arizona v. California* and a subsequent case initially took an expansive view of reserved rights.¹¹⁸ They could be implied to fulfill the purpose of a reservation. However, this view did not survive. In *United States v. New Mexico*,¹¹⁹ the Supreme Court limited implied public land rights to the minimum amount necessary to fulfill the primary (not secondary) purposes of the reservation and made it extremely difficult for the public land agencies to obtain a fraction of the water they need to manage public lands consistent with the expanded ecosystem conservation mandates of Congress. The Forest Service claimed instream flows for a wilderness area, but the majority reasoned that the 1897 Organic Act limited the purpose of national forests to “securing favorable conditions of water flows” for downstream irrigators and cities and “furnish[ing] a

115. *California Oregon Power v. Beaver Portland Cement Co.*, 295 U.S. 142, 163-64 (1935) (three Congressional Acts severed western waters from the public lands and made them “subject to the plenary control of the designated states”).

116. 373 U.S. 546 (1963).

117. *Id.* at 597-98.

118. *Cappaert v. United States*, 426 U.S. 128 (1976).

119. 438 U.S. 696 (1978). The definitive history of the litigation is discussed in G. Emlen Hall, *The Forest Service and Western Water Rights: An Intimate Portrait of United States v. New Mexico*, 45 NAT. RESOURCES. J. 979 (2006).

continuous supply of timber.”¹²⁰ The court subsequently held that both Indian and Non-Indian federal reserved water rights could be adjudicated in the state court General Adjudications, but the states had to apply federal standards. The net result is that *New Mexico* has made it difficult but not impossible for the federal government to assert non-Indian reserved water rights for public lands withdrawals. For example, after the case, the Forest Service tried to assert reserved rights for sediment transport. A Federal District Court agreed that stream integrity was a favorable condition, but held that the flows were not necessary to support this hydrologic function. The federal government has filed many public land claims as well as instream flow claims under state law. In Colorado and Idaho, the Forest Service encountered a Catch 22: state instream flow rights can only be held by a state agency.¹²¹ In addition, Idaho has developed a substantial anti-federal reserved rights jurisprudence for wildlife refuges based on the court’s “reading” of history.¹²² The federal government has fared better in Oregon, but it has not been able to reverse the years of the subordination of the refuges to irrigation.

a. Klamath Wildlife Refuge Rights

The refuges are wetlands depending on water to survive and can claim federal water rights, but water law has long split water from land and limited the ability of the federal government to claim water rights for public lands. For years the refuges’ water flow was under the control of irrigators; the refuges got return flows and any water not needed for irrigation. For example, water has been delivered to the Klamath National Wildlife Refuge, but it has always been the lowest delivery priority so it often receives only polluted agricultural waste water.

Wildlife refuges are a category of public land withdrawal which falls between the limited use mandates that characterize (or once

120. *United States v. New Mexico*, 438 U.S. at 714.

121. *In re Matter of the Amended Applications of the United States for Reserved Rights in the Platte River*, Case No. W-8439-76 (Feb. 12, 1993). See Teresa Rice, *Colorado Water Court Denies Reserved Rights Claims for Channel Maintenance*, 4 RIVERS 146 (1993) (no longer published).

122. See, e.g., *United States v. Idaho*, 23 P.3d 117, 128-29 (Idaho 2001) (finding it “inconceivable” that President Franklin D. Roosevelt would give preference to waterfowl over irrigation when he created a wildlife refuge in the Snake River island in 1937, in the midst of the dust bowl); *Potlatch v. United States*, 12 P.3d 1260, 1268 (Idaho 2000) (reserved rights do not attach to wilderness areas; Wilderness Act does not protect watersheds because Senator Frank Church, D-Idaho, would have never voted for the Act because recognition of such rights would cripple economic growth in Idaho). Wyoming has a similar tradition. See, e.g., *In re General Adjudication of All Rights to Use Water in the Big Horn River System (Big Horn III)*, 835 P.2d 273 (Wyo. 1992).

did) the national park system and the expansive, open-ended multiple use management mandates of withdrawals such as forests and grazing lands.¹²³ They grew in an uncoordinated fashion by the creation of individual areas. Refuges management has steadily evolved toward ecosystem conservation, but it took decades for this view to crystallize and, thus, multiple use philosophy has dominated thinking about refuges until recently. A comprehensive organic act was not passed until 1997. Under the National Wildlife Refuge System Improvement Act, the primary mission of the system is now to conserve and to restore wildlife habitats.¹²⁴ However, multiple-use is embedded in wildlife refuge law, especially in the Klamath, and specific uses control over the more ecosystem conservation mandate.

The Klamath Project sits squarely in the Pacific Flyway, the major migratory route for birds in western North America, and refuges were created shortly after the Project was authorized. The progressive conservation era had already reached the Klamath Basin by the time the Project was constructed. President Theodore Roosevelt is credited with creating the first refuge in 1903 when he set aside Pelican Island in Florida to preserve a breeding ground for native birds.¹²⁵ Shortly thereafter, two wildlife refuges were created in Tule and Lower Klamath Lakes.¹²⁶ The Tule Lake refuge has the distinction of being the first refuge to be superimposed on “a watershed being revamped by the Reclamation Service.”¹²⁷ President Taft later established the Clear Lake National Wildlife Refuge in 1911.¹²⁸ The refuge lands were within the project boundaries. However, Reclamation Service botanists concluded that the two could co-exist, and as a result ecosystem function and services have been consistently subordinated to irrigation.¹²⁹

The Klamath refuges were not initially recognized as valuable ecosystem fragments. They had to struggle to survive and to perform their wildlife conservation function, although refuges should have been easy to maintain. The soils in the lower Klamath were too alkaline for crops, but the pressures of settlement prevailed. In 1915, President Wilson reduced the size of the Lower Klamath

123. See generally Robert L. Fischman, *The National Wildlife Refuge System and the Hallmarks of Modern Organic Legislation*, 29 *ECOLOGY L.Q.* 457 (2002); Robert L. Fischman, *The Significance of National Wildlife Refuges in the Development of United States Conservation Policy*, 21 *J. LAND USE & ENVTL. L.* 1 (2005)

124. 16 U.S.C. § 668dd(a)(2).

125. *BALANCING WATER*, *supra* note 5, at 76.

126. *Id.* at 79.

127. *Id.* at 77.

128. *Id.*

129. *Id.*

Lake Refuge from 80,000 to 53,600 acres.¹³⁰ A Lower Klamath drainage basin district was organized, and the lake was drained and reduced to a 365-acre pond.¹³¹ Homesteading began in the Tule Lake area in 1916 and did not end until 1949, one of the last gaps in the great project of public land disposition.¹³² In 1946, during the last gasp of the nineteenth century homestead experiment, farmers in Tule Lake were threatened by the annual migration of waterfowl along the Pacific Flyway, and the Fish and Wildlife Service stepped in to practice what we might now call adaptive management. Pressured to take action, the FWS tried a number of methods to help the farmers clear their fields of waterfowl. Using military surplus equipment such as smoke grenades, searchlights, and small airplanes, the FWS herded the birds back into the refuges. The service also issued permits that allowed local farmers and their Mexican laborers to scare birds from the fields with shotguns and flares. The combined efforts of these groups contained the birds on the refuge until farmers completed their harvest. For the most part, the birds remained there until hunters came to kill them after the beginning of hunting season in October or until they flew south to their wintering grounds in California's Central Valley and Mexico.¹³³

The environmental consequences of the draining of the lake were clear. The area turned into a "desert waste of dry peat and alkali."¹³⁴ The peat periodically burned. Restoration began in 1941, when excess water from Tule Lake was diverted back into Lower Klamath and the birds returned.¹³⁵ Farmers learned to leach the soils; thus, like many refuges, they receive nutrient-rich return flows instead of clean water.¹³⁶ In 1964, Senator Thomas Kuchel of California succeeded in passing legislation for the refuges.¹³⁷ Waterfowl management was declared the major purpose of the refuge but "with full consideration to optimum agricultural use."¹³⁸ The federal government was authorized to lease lands in the Upper and Lower Klamath refuges and the Tule Lake refuge for crops.¹³⁹ This multiple use not only benefits farmers in refuges, but over time, one of the rationales for crop raising is that migra-

130. BALANCING WATER, *supra* note 5, at 78.

131. *Id.*

132. *Id.* at 81, 85.

133. Robert M. Wilson, Directing the Flow: Migratory Waterfowl, Scale, and Mobility in Western America, 7 *Environmental History* 247 (2002).

134. BALANCING WATER, *supra* note 5, at 79.

135. *Id.*

136. *Id.*

137. *Id.* at 86.

138. 16 U.S.C. § 6951 (1964).

139. *Id.*

tory birds will feast in this area and fewer will fly on to the Central Valley and eat higher valued crops. In fact, about seventy-five percent of the leased lands in the refuge are for grain crops on which the birds feed. Legislation passed in 1964 allows leasing, but it does not protect farmers from the market. Farm sales decreased in the Refuge from some \$30 million in the 1980s to around \$20 million in the 1990s.¹⁴⁰ An Environmental Assessment disclosed substantial adverse impacts to the refuge's ecosystem.¹⁴¹ However, there has been no systematic assessment of the value of its ecosystem services, although they can reasonably be expected to increase substantially in the future as the area becomes more of a "life style" destination. A 2002 Fish and Wildlife Study found that visitor expenditures were around \$2 million dollars and generated \$797,600 in employment income¹⁴² at the same time that the Final Environmental Assessment for the continued leasing program reported lease revenues of only \$1,884,026 in 1996, the last year surveyed.¹⁴³ These ecosystem service values are expected to increase in the future. Nonetheless, the FWS has implemented a pilot "walking wetlands" program in the refuge.¹⁴⁴ Lands are alternatively drained, put into potato production, and then flooded.

The federal government has begun to claim reserved rights for the refuges, but it is difficult to obtain sufficient quantities of water to adequately support the ecosystem to which they attached.¹⁴⁵ The problems start with the uncertainty about all water rights in the basin. Despite over 100 years of project operation, the Klamath Basin remains unadjudicated, although a state adjudication has been ongoing since 1975.¹⁴⁶ Thus, the irrigators enjoy a vast advantage because their existing uses are *de facto*, but not necessarily *de jure*, measures of their actual water rights, even though they may in fact be entitled to less water than claimed.¹⁴⁷ In the Klamath adjudication, the U.S. Forest Service filed 212 claims, the Bureau of Land Management filed fifty-two, and the

140. FISH AND WILDLIFE SERV., U.S. DEP'T OF THE INTERIOR, FINDING OF NO SIGNIFICANT ACTION, IMPLEMENTATION OF AGRICULTURAL PROGRAM ON TULE LAKE NATIONAL WILDLIFE REFUGE 3.5.3 (2002), available at <http://www.fws.gov/klamathbasinrefuges/FinalEnvironmental/AgProgramEa.pdf> [hereinafter ENVIRONMENTAL ASSESSMENT].

141. *Id.* at 4.1.1.

142. U.S. FISH AND WILDLIFE SERVICE, BANKING ON NATURE 2002: THE ECONOMIC BENEFITS TO LOCAL COMMUNITIES OF NATIONAL WILDLIFE REFUGE VISITATION 35 (2003), available at http://www.fws.gov/southeast/grants/BankingOnNature2002_101403.pdf.

143. ENVIRONMENTAL ASSESSMENT, *supra* note 141, at 3.5.2.

144. Natural Resources Conservation Service, United States Department of Agriculture, Klamath Basin Conservation Partnership Accomplishments (2007), available at <http://www.nrcs.usda.gov/feature/klamath/images/BrochureProgressReport2007.pdf>.

145. See *Fish, Farms, and the Clash*, *supra* note 3, at 303-05.

146. *Id.* at 302.

147. *Id.*

Fish and Wildlife Service filed twenty-two claims for the four different refuges.

The federal government has focused more on Indian claims than on refuge claims in the Klamath adjudication¹⁴⁸ and has made major concessions to the irrigators. Nonetheless, Oregon still contests the scope of the claimed rights. For example, the United States agreed to take a 1985 priority date for the Klamath Marsh National Wildlife Refuge in Oregon, although the priority date would ordinarily be 1960, the date of the creation of the refuge. Oregon has agreed that the primary purpose of the refuge is migratory bird conservation and thus even under *New Mexico*, the United States is entitled to the minimum amount of water necessary to prevent the frustration of this objective. But the state has taken a harder line on the rights claimed in the Upper Klamath Wildlife Refuge with a 1928 priority date. President Hoover's original Executive Order described the purpose of the refuge as a "breeding ground for birds and wild animals,"¹⁴⁹ but Congress described the purpose as "to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway."¹⁵⁰ Following the letter of *New Mexico*, Oregon claims that any water rights can only be used to manage waterfowl.¹⁵¹ These narrow readings, if upheld, limit the ecosystem service potential of the reserved right.

b. Indian Water Rights

Indian tribes can potentially claim federal water rights to large amounts of water including ecosystem service claims, although the latter have often been limited and must be adjudicated in state proceedings.¹⁵² Unfortunately, the Klamaths are unlikely to match the success of other tribes with a large potential irrigable reservation.¹⁵³ Historically, the main purpose of federal Indian water rights has been to give Indians parity with white irrigators to speed Indian assimilation. The primary standard for the right is the practicable irrigable acreage (PIA) of the reservation.¹⁵⁴ The Court came close to replacing the standard with one much more

148. *E.g.*, *Adair v. United States*, 723 F.2d 1394, *cert. denied*, 467 U.S. 1252 (1983).

149. Exec. Order No. 4851 (1928).

150. 16 U.S.C.A. § 695k (2006).

151. Memorandum from Walter Perry, Assistant Attorney General, Natural Resources Section to Richard Bailey, Adjudicator, Water Resources Department, September 19, 1999.

152. *Colorado River Water Conservation Dist. v. United States*, 424 U.S. 800 (1976).

153. BONNIE G. COLBY, JOHN E. THORSON & SARAH BRITTON, *NEGOTIATING TRIBAL WATER RIGHTS: FULFILLING PROMISES IN THE ARID WEST* (2005).

154. *Arizona v. California*, 373 U.S. 546, 600-01 (1963).

favorable to Indians,¹⁵⁵ but PIA remains the law. So far courts have agreed that PIA does not require a positive benefit-cost analysis and that tribes are not limited to farming methods in use at the time that the reservation was created.¹⁵⁶

PIA does the Klamath Tribe and the ecosystem no good. Nonetheless, the Klamath have successfully used the *Winters*¹⁵⁷ doctrine to increase their bargaining power within the basin and to bolster the ecosystem, although no Indian water right is actually devoted to ecosystem services. The Tribe first had to establish its right to water even though its historic reservation had been terminated by Congress in the last gasp of assimilation during the 1950s. In the end, *Winters* rights were attached to the remnant Tribe and to the lands severed from the reservation during the first wave of assimilation, the allotment era. *United States v. Adair* held that the Klamath Termination Act expressly preserved pre-existing water rights, including an instream flow right necessary to effectuate the hunting and fishing rights reserved to the Klamath Tribe by the 1864 treaty creating the reservation.¹⁵⁸ That water right, the court ruled, dated to time immemorial, not merely to the 1864 treaty. With respect to allotted lands, the court held that Indian successors to the lands had a right to a portion of the tribal reserved right.¹⁵⁹ Non-Indian successors enjoyed a slightly less secure right.¹⁶⁰ Non-Indians acquire an 1864 priority to water sufficient to irrigate both the acreage under irrigation at the time of transfer and any additional acreage that may be reasonably irrigated.¹⁶¹

United States v. Adair was a significant and lasting tactical victory for the Klamath Tribe, but the Court of Appeals did not quantify the tribe's reserved rights and left many questions unanswered. The instream flow right only gives the Tribes the right to enjoin depletions of the river when they threaten to interfere with protected hunting and fishing rights.¹⁶² In 2001, the United States

155. *In re General Adjudication of All Rights to Use Water in the Big Horn River system*, 753 P.2d 76 (Wyo. 1988), *aff'd by an equally divided Court sub nom.* Wyoming v. United States, 492 U.S. 406 (1989).

156. *Arizona v. California*, 460 U.S. 695 (1983). The Supreme Court subsequently held that non-Indian reserved rights were limited to the "principle purpose" of a land withdrawal. *New Mexico*, 438 U.S. 696, 716. This standard potentially applies to Indian water rights, but the Supreme Court has not limited Indian water rights as it has non-Indian federal reserved rights.

157. *Winters v. United States*, 207 U.S. 564 (1906).

158. 723 F.2d 1394, 1411-17.

159. *Id.* at 1415-17.

160. *Id.* at 1417.

161. *Id.* The right of non-Indian allottees had been previously recognized in *Colville Confederated Tribes v. Walton*, 647 F.2d 42 (9th Cir. 1981).

162. *See Adair*, 723 F.2d at 1411.

and the Tribes asked the federal district court to reopen the *Adair* decree to clarify the standard for determining the Tribe's right after the Oregon Water Resources Department formally interpreted *Adair* to limit Indian use to a moderate living capped by the low level of hunting, fishing, and gathering activity in 1979. The district court subsequently expanded *Adair* to hold that the Tribe's treaty water entitles it to sufficient water levels to support the necessary productive aquatic habitat which it defined as the habitat currently used, not that used in 1864.¹⁶³ This crabbed interpretation of the Tribe's treaty entitlement was rejected by the federal district court. Instead, the Tribe has the right to whatever water is necessary to achieve a supported habitat.¹⁶⁴

The current bottom line is that the existence of water rights gives the Tribe important political and legal leverage, but has not fundamentally changed the status quo. The Tribe's potential rights are counter-balanced by the ability of the irrigators to continue to divert water by water rights which have not yet been determined to be valid. Despite the Klamath Tribe's victories between 1983 and 2005, the Tribe is still waiting for a quantified water right, while the Project and non-Project irrigators use much of the basin's water to grow crops. The Tribe's right is essentially negative. As the Ninth Circuit said in *Adair*, "the entitlement consists of the right to prevent other appropriators from depleting the streams [sic] waters below a protected level in any area where the non-consumptive right applies."¹⁶⁵ Both the irrigators and the Indians will have to navigate their future in the context of a doctrine that is both stable and evolving, but which remains biased in favor of the status quo.

2. *Are Coasian Bribes Possible in the Klamath?*

Much of the writing on the provision of ecosystem services assumes that existing property rights are a barrier to service provision, and thus existing right holders should be "bribed" through compensation to dedicate their property to ecosystem services. There are two distinct primary rationales for taking property rights as they lie. The first is instrumental. The arguments based on this rationale range from the straight-forward "real politick" argument that it is usually faster and cheaper to pay for the rights than to contest them to more nuanced arguments that compensa-

163. *United States v. Adair*, 187 F. Supp. 2d 1273, 1278-79 (D. Or. 2002) *vacated sub nom.* *United States v. Braren*, 338 F.3d 971 (9th Cir. 2003).

164. *Adair*, 187 F. Supp. 2d 1273.

165. *Adair*, 723 F.2d at 1411.

tion is necessary to overcome cultural biases against ecosystem service provision.¹⁶⁶ The second rationale is an ethical justification. Property rights are a guarantee against sudden majoritarian changes in policy, regardless of the merits of the new policy.¹⁶⁷ Thus, clearly established rights must be respected. The two principal counter arguments are that the property right claimed may be less established and free of risks of change than the holders assume and that payment creates a moral hazard problem. A moral hazard is a law or social policy that encourages inefficient action because there will be no penalty for taking it.¹⁶⁸

The Klamath farmers derive much of their political power from their water entitlements, water rights perfected by hard work under the doctrine of prior appropriation and protected in a variety of waters by Oregon as well as federal law. Irrigators have every incentive to hold their water rights until the harsh discipline of the market takes effect and the federal government withdraws from its historic role of buffering western farmers from this discipline. The Klamath water right holders are also encouraged to continue behavior with high potential private and social costs because they know that they will be compensated for any losses that they incur or that the government will bail them out, as it has, with emergency relief. The control of water in the Klamath is the key to the basin's destiny. Water entitlements are both a source and a manifestation of political power. The Klamath experience to date suggests that the case for sole reliance of a Coasian solution, which is indifferent to the assignment of property rights, should be carefully examined. In addition to cultural resistance to the cold logic of efficiency, the existence of firmly entrenched rights will push authorities to adopt a solution that carries with it a high risk of "sub-optimization" if not failure. For example, after the summer of 2001, the Bureau of Reclamation created a faux water bank in the Klamath.¹⁶⁹ It is a faux bank because it is not a permanent pool of water with deposits and withdrawals, but rather a series of ad hoc payments to irrigators to either retire land or drill wells.¹⁷⁰ A 2005 GAO report concluded that Reclamation gas met its flow targets, but the actual reduction of water use was difficult to quantify

166. Elmendorf, *supra* note 65.

167. See, e.g., Jesse J. Richardson, Jr., *Downzoning, Fairness and Farmland Protection*, 19 J. LAND USE & ENVTL. L. 59 (2003). For a reply see Mark W. Cordes, *Fairness and Farmland Preservation: A Response to Professor Richardson*, 20 J. LAND USE & ENVTL. L. 371, 372 (2005).

168. For an excellent analysis of these issues, see James Salzman, *Creating Markets for Ecosystem Services*, 80 N.Y.U. L. Rev. 870 (2005).

169. *Fish, Farms, and the Clash*, *supra* note 3, at 327-28.

170. *Id.*

because Reclamation lacks “effective flow measurement equipment and monitoring data for the Klamath Project.”¹⁷¹ The net result was the Bureau accelerated groundwater depletion and did not provide enough water for downstream Coho Salmon support.¹⁷² Finally, the rush to a Coasian solution also creates no incentive to explore the extent to which the claimed existing entitlements are immune to readjustment. Water rights are as much about risk as they are about stability. The focus should be on the actual expectations that lie behind a use¹⁷³ so that alternative ways of satisfying those expectations can be accommodated.

3. *The ESA*

As previously mentioned, the environmental movement reached the Klamath primarily through the ESA. The Act has the potential to reallocate water rights, although any reallocation is likely to be seasonable. Courts have consistently held that the existence of a vested state water right is no defense to compliance with the Act.¹⁷⁴ Two courts of claims have split on the issue of whether withheld deliveries constitute a taking.¹⁷⁵ The earlier discussion of the ESA suggested that the Act is less of a catalyst than many hope because the Act is vulnerable to reinterpretation in ways that make it difficult, but not impossible, to challenge in court. In brief, after the 2001 summer and the interim National Research Council report, which rejected the Fish and Wildlife Service’s conclusion on Upper Klamath Lake levels and questioned its conclusions about the need for downstream Coho salmon flows, the Bureau issued a new BiOp.¹⁷⁶ The 2002 BiOp designated a relatively wet period, 1990-1999, as the baseline, and the Bureau developed a ten-year operating plan for the project. Upper Klamath Lake levels would be maintained at levels no lower than the average end-of-end elevations over a ten-year period and daily average Klamath River flows would be no lower than ten year averages

171. GAO, *supra* note 91, at 25.

172. *Id.* at 25-28.

173. This analysis echoes and recasts the Progressive Era concern that the monopolization of water rights would prevent the more widespread distribution of access to water to the detriment of society’s interest in the conservation of resources. For example, the great treatise writer Samuel Wiel, in *Water Rights in the Western States*, floated the idea that unreasonable assertions of priority would not be recognized. SAMUEL WIEL, *WATER RIGHTS IN THE WESTERN STATES* 329-40 (3d ed. 1911).

174. *Fish, Farms, and the Clash*, *supra* note 3, at 310-11.

175. *Tulare Lake Basin Water Storage Dist. v. United States*, 49 Fed. Cl. 313 (U.S. Ct. Fed. Claims 2001) (finding there was a taking); *Klamath Irrigation Dist. v. United States*, 67 Fed. Cl. 504 (U.S. Ct. Fed. Claims 2005) (finding there was not a taking).

176. BR FINAL 2002 BIOLOGICAL ASSESSMENT, *supra* note 38.

plus a 10,000 acre foot April pulse for downstream smolt migration.¹⁷⁷

The story of how the Bush II Bureau of Reclamation and Department of Interior quickly tilted the balance from fish to farmers is both a tale of the legitimate use of the political process and the legacy of the environmental movement to limit the use of old-fashioned influence politics to undermine statutes. A 2002 report by the National Research Council took the Bureau off the hook for Upper Klamath lake levels and cast doubt on the benefit of minimum flows for the Coho, but not for downstream flows.¹⁷⁸ However, instead, of trying to implement its call for a broad menu of ecosystem restoration measures, the Bureau tried to protect the irrigators from all risks in its “creative” 2002 BiOp.¹⁷⁹ The ten-year plan was a deft way to push the problem as far into the future as possible by transferring the risks from upstream to downstream species in contravention to the mandates of the ESA. Under pressure, the National Marine Fisheries Service ultimately acceded to the 2002 BiOp, but with serious reservations.¹⁸⁰ NMFS was concerned primarily with the fact that because the Bureau had pushed the dates for full compliance with the target levels and flows to the end of the ten-year period,¹⁸¹ “the mean flows for each water year type will decline toward the minimums that occurred during the reference period,”¹⁸² which “is expected to increase the risk of extinction to Klamath Basin Coho Salmon”¹⁸³ and the many scientific uncertainties in the assumptions behind the opinion. Not surprisingly, courts found that the plan did not adequately protect the Coho and invalidated most of it.¹⁸⁴ To date, the downstream fisherman have not benefited from the decision; as previously mentioned, the 2006 Coho season was virtually eliminated because of low runs.

This is a familiar problem when courts apply the ESA to existing entitlements. A similar story occurred on the Missouri River. In 2002 the National Research Council issued a report calling for the development of a new flow regime on the river to protect endangered species and biodiversity generally.¹⁸⁵ NGOs won a major

177. *Id.*

178. NATIONAL RESEARCH COUNCIL, THE MISSOURI RIVER ECOSYSTEM: EXPLORING PROSPECTS FOR RECOVERY (2002) (I was a member of the NRC committee that produced the report).

179. BR FINAL 2002 BIOLOGICAL ASSESSMENT, *supra* note 38.

180. NMFS 2002 BiOp, *supra* note 85.

181. *Id.* at 63.

182. *Id.* at 36.

183. *Id.* at 49.

184. See *infra* note 108.

185. NMFS 2002 BiOp, *supra* note 85 at 52-45.

decision compelling the United States Army Corps of Engineers to release more water in the spring and less in the summer to benefit a listed fish,¹⁸⁶ but the Department of Interior replaced the original team which issued the Biological Opinion which provided the support for the modified flow regime. A new opinion appeared, recommending against the original spring-summer release plan, and a federal district court upheld it.¹⁸⁷ The Missouri ecosystem is still at risk.

VI. CONCLUSION

The Klamath is a classic illustration of market underproduction to public goods.¹⁸⁸ Instead of long term solutions, those that emerge tend toward the negative state of affairs described by a leading Italian anti-Fascist diplomat in characterizing his objective in negotiating a post-World War I treaty between Italy and the newly created Yugoslavia: "that the causes of discontent should be equally divided between the two nations."¹⁸⁹ This may be the best that one can hope for among nation states, but ecosystem and biodiversity conservation require a more affirmative response if this laudable objective is to be realized.

The modification of the unsustainable status quo in the Klamath with institutions that recognize the value of the Basin's ecosystem services and encourage their production, by payments or legal duties, remains an unfulfilled aspiration in the Klamath. There are, however, some hopeful signs. The relicensing of Iron Gate dam has created a forum. The existence of entrenched property rights combined with a Bureau of Reclamation committed to supporting them to the maximum extent possible with the ESA creates powerful incentives not to seek a permanent solution built around ecosystem service provision. Litigation to compel stringent regulation or to prevent it remains the preferred mode of problem solving. Let us hope that in the twenty-first century, the real happy endings are not just in sports.

186. *South Dakota v. Ubbelohde*, 330 F.3d 1014 (8th Cir. 2003).

187. *In re Operation of the Missouri River Sys. Litig.*, 363 F. Supp. 1145 (D. Minn. 2004). See Sandra Zellmer, *A New Corps of Discovery for the Missouri River Management*, 83 NEB. L. REV. 305 (2004).

188. See MANCUR OLSON, *THE LOGIC OF COLLECTIVE ACTION* (Harvard Univ. Press 1971)(1965).

189. COUNT CARLO SFORZA, *ITALY AND THE ITALIANS* 86 (1949).