Ocean and Coastal Law Journal

Volume 5 | Number 2 Article 6

2000

# Dam Removal: Evolving Federal Policy Opens A New Avenue Of Fisheries And Ecosystem Management

Peter J. Carney
*University of Maine School of Law*

# DAM REMOVAL: EVOLVING FEDERAL POLICY OPENS A NEW AVENUE OF FISHERIES AND ECOSYSTEM MANAGEMENT

*Peter J. Carney* *

## I. INTRODUCTION

When the United States was a young nation, and its natural resources were perceived as endless, dams and the power they produced were viewed as sources of "free" energy. But, as has been the case in so many other situations where assumptions were made on the basis of "bottomless" resources, the continued existence of many dam projects is questionable. Environmental costs externalized by dam operators have become apparent as real costs in the form of a degraded environment and the decline of natural resources supported by riverine ecosystems, such as anadromous fish.

As many dams have come down and others await demolition, the circumstances necessary to their removal have become evident, and arguments in favor and opposition of dam removal are no longer simply speculative. Despite the fact that several dams have been removed, however, we are left with certain unanswered questions, such as the unknown ecological consequences of removing large dams that have stood for a century or more, and the untested authority of a key government agency. Despite some uncertainties, dam removal plans are proceeding and further removals are inevitable.

The removal of dams generally, and the recent arrangement for the removal of dams on both the Atlantic and Pacific Coasts has focused on the restoration of habitat for various species of anadromous fish that migrate up rivers from the sea to spawn in freshwater. Fish such as salmon are often the focus as beneficiaries of dam removal because the health of these stocks can be measured in both economic and environmental terms. The restoration of habitat for anadromous fish, especially on the West Coast, is

* University of Maine School of Law, Class of 2000.

encouraged on the basis that increased habitat will mean an increase in fish, thus, commercial fisheries will benefit. Dam removal, however, has far broader ramifications than the anticipated effects on migratory fish. Dam removal will also facilitate the restoration of entire ecosystems. The removal of large dams will result in an increase in the number of organisms from the bottom of the food chain to the top level predators. If salmon and other anadromous fish recover, their recovery will well serve as an indicator that the overall health of the ecosystem is also improving.

The process of dam removal has been very contentious, taking years of planning, research, negotiation, and legal argument. The parties involved include environmentalists, government, dam owners, and private landholders—each with unique interests. Environmentalists see dam removal as the keystone of regional ecosystem restoration projects. Other proponents of dam removal are quick to point out the economic returns of dam removal ranging from increased fish stocks for commercial fisheries, to increased revenues generated through recreation and tourism.

Governmental policy is evolving away from the pro-development attitudes of the early 1900s toward a more balanced approach to dam construction. The federal agency responsible for licensing federal dams has seen its policy evolve over the past eighty years. Once responsible for promoting the increased utilization of hydropower for an industrializing nation, the Federal Energy Regulatory Commission now finds itself in the position of a protectorate of the environment. This policy shift is making it possible for governmental agencies to consider dam removal as a viable alternative to long-standing practices of automatically issuing new permits when existing projects come up for relicensing.[1]

Dam owners, the most vocal opponents to dam removal, bring claims of particularized harm including uncompensated takings of property, loss of future revenues, and of costs arising from being deprived of cheap sources of electricity.[2] In addition, riparian landowners claim that property interests are being taken in the form of disrupting a particular water level of a reservoir, or rate of flow of a river, that they have come to rely upon. Fluctuations in water level may leave some landowners high and dry, as land once at the edge of an impoundment may no longer be so after the impoundment is drained. Downstream landowners, having long enjoyed the controlled flow of water through dams, worry about flood control.

---

1. *See* FERC Project Decommissioning at Relicensing; Policy Statement, 60 Fed. Reg. 339, 341 (1995) ("In nearly every instance, existing licensees have applied for, and received, new power licenses when their old ones expired.").

2. Edwards Manufacturing Co., the owners of the Edwards Dam, received $2.5 million annually from energy generated by the dam and sold to Central Maine Power. *See* NATURAL RESOURCES DEFENSE COUNCIL OF MAINE, SPECIAL REPORT: RESTORING THE KENNEBEC RIVER 4 (June/July 1997).

This Comment seeks to differentiate the many speculative arguments that have been made during dam removal processes from those policy and legal arguments that have proven to be central considerations in future dam removal projects. The governmental regulatory mechanisms necessary to securing dam removal will be reviewed and analyzed. The most recent data on the ecological effects of dam removal, both positive and negative, will be presented. Finally, the legal arguments likely to find their way into court will be analyzed in the light of past judicial opinions and administrative determinations that may provide insight into the final disposition of potential cases stemming from dam removal projects.

The analysis of the dam removal process will be presented in both general and case-specific contexts. General propositions will be discussed relevant to the removal of most federally regulated dams. Case specific analysis will be given in the context of removing the Elwha and Glines Canyon Dams on the Olympic Peninsula in Washington State, and the Edwards Dam on the Kennebec River in Augusta, Maine. These three dams are the first large dams slated for removal, have received the greatest attention in the press, and because the governmental mechanisms employed to remove the dams are different, permit two unique strains of analysis.

## II. BACKGROUND

In the United States, 74,993 dams block 600,000 miles of what was once free flowing river.[3] Although, dams are installed in rivers for purposes of irrigation, navigation, flood control, and water supply, they are most well-known for generating electricity. The overall amount of hydropower being produced annually in the United States has increased over the past century, but the percentage of electricity created by hydropower when compared with all other sources has steadily declined. In the 1960's, hydropower in the United States generated 33,000 megawatts of electricity, totaling 20% of the nation's generating capacity.[4] In 1996, hydropower generated 74,800 megawatts of electricity, a 100% increase, but comprising only 10% of total generating capacity.[5]

The possibility of removing dams has greatly increased over the last decade as government policy has shifted, requiring a balancing of environmental concerns with economic benefits when issuing original or renewal

3. *See* Bruce Babbitt, Remarks at the Ecological Society of America on Removing Dams (Aug. 4, 1998), *in Friends of the River, Headwaters* (Summer 1998), at 3.

4. *See generally* FERC Office of Hydropower Licensing, *Water Power* (visited Jan. 18, 1999) <http://www.ferc.fed.us/hydro/docs/waterpwr.htm> [hereinafter FERC, *Water Power*].

5. *See id.*

licenses. The time is ripe for a push into the area of dam removal because many dams will see their licenses expire shortly. In the years 2000-2001, sixty-nine licenses will expire that will be subject to stringent environmental standards statutorily provided for in 1986.[6]

The realm of dam removal can be difficult to understand. The issue requires one to be part engineer, part fisheries biologist, and part ecologist, and requires an understanding of the various legal complexities and regulatory interests involved. To better understand the impacts that dams have on rivers it is necessary to describe the physical nature of the structures and how they operate.

Upon construction of the dam itself the flow of the river is stopped creating an upstream reservoir or impoundment behind the dam wall.[7] Some dam projects result in fluctuating water levels in the impoundment as releases are tailored to energy production needs.[8] In some instances, from the base of the dam extends a "penstock," essentially a large diameter pipe that carries water from the dam to a downstream powerhouse.[9] The powerhouse may be located anywhere from a few hundred yards, to fifteen miles downstream of the penstock. Where penstocks are utilized, the interlying streambed may be left completely dry, bypassing an entire section of river.[10] In such situations, all ecological continuity in the river is destroyed. Located within the powerhouse are the turbines, whose large propeller-like blades are pushed by the force of passing water causing the turbines to turn, and subsequently generate electricity.[11]

## III. THE FEDERAL ENERGY REGULATORY COMMISSION

### *A. The Evolution of FERC's Policy on Dam Removal*

A key player to any notion involving dam removal is the Federal Energy Regulatory Commission (FERC), the federal agency responsible for licensing dams over which the federal government has jurisdiction.[12] The scope of FERC's licensing authority extends to: (1) dams constructed on navigable rivers; (2) affecting interstate commerce; (3) utilizing water or

---

6. *See id.*
7. *See* American Rivers, *Damage*, AM. RIVERS MAG., Winter 1999, at 10.
8. *See id.*
9. *See id.*
10. *See id.*
11. *See id.*
12. *See* FERC Office of Hydropower Licensing, *Origin of Hydroelectric Regulation* (visited Jan. 18, 1999) <http://www.ferc.fed.us/hydro/docs/ORIGIN.htm> [hereinafter FERC, *Origin of Hydroelectric Regulation*].

water power at a government dam; or (4) occupying lands of the United States,[13] giving FERC authority over 2000 dams nationwide.[14]

FERC's primary licensing duties include issuing preliminary permits for proposed projects, issuing original and renewal project licenses, and making determinations on exemptions from licensing.[15] In addition, FERC performs project compliance activities to ensure that conditions on which permits are issued are adhered to, administers dam safety programs, coordinates hydropower projects with other agencies, and, as statutorily required, undertakes a balancing of environmental and economic concerns in determining the nature of potential and existing hydropower projects.[16] Dam licenses issued by FERC have an expiration time of thirty to fifty years.[17] Because FERC will undeniably have a role in the removal of many large dam projects, the analysis of many dam removal projects must be viewed through the lens of the general principles of administrative law.

### *B. FERC's Congressional Grant of Authority*

FERC's history dates to the 1920 enactment of the Federal Power Act (FPA),[18] which first established the Commission that continues to oversee dam licensing today, then coined the Federal Power Commission (FPC).[19] The FPC was comprised of the Secretaries of War, Agriculture, and the Interior.[20] In 1930, the form and composition of the Commission was altered when it was established as an independent agency consisting of five members appointed by the President subject to confirmation by the Senate.[21] In 1977, with the Department of Energy Reorganization Act,[22] Congress abolished the FPA and established the Federal Energy Regulatory Commission as we know it today, which inherited most of the duties of the FPC.[23]

---

13. *See id.*
14. *See id.*
15. *See generally* FERC, *Water Power*, *supra* note 4.
16. *See* FERC Office of Hydropower Licensing, *Missions & Functions* (visited Jan. 18, 1999) <http://www.ferc.fed.us/hydro/docs/mission.htm>.
17. *See* FERC, *Origin of Hydroelectric Regulation*, *supra* note 12.
18. Federal Power Act, Pub. L. No. 66-280, 41 STAT. 1063 (1920).
19. *See id.*
20. *See* FERC, *Water Power*, *supra* note 4.
21. *See id.*
22. Department of Energy Reorganization Act §§ 101-1002, 42 U.S.C.A. §§ 7101–7352 (West 1995 & Supp. 1999).
23. *See id.* § 204 (codified at 42 U.S.C. § 7134 (West 1995)).

### *C. FERC's Power to Order Dam Removal*

The greatest source of argument in the dam removal controversy is whether FERC possesses the authority to order dam removal. Assuming FERC holds this authority, as is claimed by the Commission, a host of other questions are raised. Under what conditions may FERC order removal? Who is liable for the costs of demolition and site remediation? Must FERC compensate the owner for the value of the dam itself or for a resulting loss of income? Do riparian landowners have a vested property interest in the level or flow of a stream, river, or impoundment? As will be discussed, FERC has declared the authority to order dam removal, but this authority has yet to be challenged in court. Because of crafty negotiating by FERC on recent removal actions, it has avoided a direct challenge to this authority; as time passes this authority may become ingrained the longer it stands unchallenged.

#### 1. FERC's Licensing Procedures

A cursory review of FERC's guidelines for issuing original and renewal licenses indicates a well-balanced analysis in the approach to making licensing determinations.[24] The filing process for an original license entails a prefiling consultation process requiring meetings among various government and tribal agencies, scientific studies, public notice and comment periods, and meetings with parties disagreeing with the stated effects of the proposed project on the area's resources.[25] The application for license must include an engineering analysis and address the economic aspects of the project.[26] In addition, the application must include an environmental report describing the effects the project would have on fish, water quality, wildlife, botanical resources, geology, soils, recreation, land use, and socioeconomic values.[27] Following receipt of an application, but before FERC undertakes and issues its Environmental Impact Statement (EIS) on a proposed project as required by the National Environmental Policy Act (NEPA), there are several opportunities for public comment on environmental assessments and mitigation measures.[28] Under FERC's guidelines, the process for relicensing an existing project is nearly identical to the process for an original license.[29] In the course of making a determi-

24. *See* Regulations Under The Federal Power Act, 18 C.F.R. § 4.38 (1998).
25. *See id.*
26. *See id.* § 4.38(b)(1)(ii).
27. *See id.* § 4.38(b)(1)(iv).
28. *See id.* § 4.38(g).
29. *See* FERC, *Water Power*, *supra* note 4.

nation on a renewal license, it is unclear what happens if, after undertaking an analysis for relicensing, FERC determines the continuance of an existing project is no longer acceptable under the current guidelines. The FPA is ambiguous as to FERC's authority in such situations.

### 2. The Electric Consumers Protection Act of 1986

According to FERC, implicit in the FPA and subsequent amendments is the Commission's authority to order dam removal. In 1986 Congress passed the Electric Consumers Protection Act (ECPA),[30] officially altering the considerations that FERC must take into account when issuing licenses. In section 3(a) of the ECPA, a provision affecting the general powers of the Commission, FERC is required to give equal consideration to environmental and other factors when making permitting determinations.[31] The ECPA requires that the same considerations be taken into account when making renewal licensing determinations on an existing project.[32]

Prior to the 1986 amendments, however, the statute required only that FERC consider the proposal a benefit to a comprehensive plan for developing a waterway in the best interests of *commerce* and *water power development*.[33] The 1986 amendments added to the comprehensive development mix the "adequate protection, mitigation, and enhancement of fish and wildlife and their habitats."[34]

---

30. Electric Consumers Protection Act, PUB. L. NO. 99-495, 100 Stat. 1243 (1986) (codified in scattered sections of 16 U.S.C.A.).

31. *See* 16 U.S.C.A. § 797(e) (West 1998 & Supp. 1999). The relevant statutory language reads:

> PURPOSE OF LICENSE—Section 4(e) of the Federal Power Act is amended by adding the following at the end thereof: "In deciding whether to issue any license under this part for any project, the Commission, in addition to the power and development purposes for which the license are issued, shall give equal consideration to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of, fish and wildlife (including related spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality."

*Id.*

32. *See id.* § 808(a)(2)(G) (West 1998 & Supp. 1999).

33. *See id.* § 803(a) (prior to 1986 amendments) (emphasis added).

34. *Id.* § 803(a)(1). Conditions of License Generally.

> All licenses under this subchapter shall be on the following conditions:
>
> (a) Modification of plans; factors considered to secure adaptability of project; recommendations for proposed terms and conditions
>
> (1) That the project adopted, including the maps, plans and specifications, shall be such as in the judgment of the Commission will be best adopted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce, for the improvement and utilization of water-power development, for the

The amendments also gave greater influence in the process to other federal agencies, state governments, and Native American tribes.[35] The Commission is now required to consider the recommendations of federal and state agencies and native American tribes exercising administration over flood control, navigation, irrigation, recreation, and other cultural and relevant resources of the state in which the project is located.[36] A special provision was added specifically for fish and wildlife protection.[37] Under this new provision, FERC must issue licenses with conditions necessary to protect, mitigate, and enhance fish and wildlife, including related habitat.[38] The conditions are to be based on recommendations received from the National Marine Fisheries Service (NMFS), the United States Fish and Wildlife Service (USF&WS), and state fish and wildlife agencies.[39] As will be seen in the following analysis of the removal of dams in Washington and Maine, this provision played and important role in FERC's determinations. In both those situations federal and state agencies submitted strong recommendations for removal.

### *D. FERC's 1994 Policy Statement on its Authority to Order Dam Removal.*

The new variables in this "comprehensive" development[40] approach to licensing, as mandated by the ECPA, led FERC to reevaluate its policies, leaving the agency without guidance on what course to take in the event that the relicensing of an existing project did not meet the new, more stringent, licensing standards. Subsequent to receiving comments solicited in a notice of inquiry on this issue,[41] FERC declared that the Commission was implicitly empowered with the authority to order complete removal of an

---

> adequate protection, mitigation, and enhancement of fish and wildlife (including related spawning grounds and habitat), and for other beneficial public uses, including irrigation, flood control, water supply, and recreational and other purposes referred to in section 797(e) of this title if necessary in order to secure such plan the Commission shall have the authority to require the modification of any project and of the plans and specifications of the project works before approval.

*Id.*

35. *See id.* § 803(a)(2)(B).
36. *See id.* §§ 803(a)(2)(B), 803(a)(3).
37. *See id.* § 803(j).
38. *See id.* § 803(j)(1).
39. *See id.*
40. *See id.* § 803(a)(1).
41. *See* FERC Project Decommissioning at Relicensing; Notice of Inquiry, 58 Fed. Reg. 48,991 (1993).

existing project at the dam owner's expense, declaring this authority in a 1994 policy statement.[42]

In that policy statement, FERC claimed that its interpretation of the FPA and its newly found authority to order nonconsensual dam removal was supported by general rules of interpreting statutory law in regard to agencies, and statutory history. FERC cited the principles embodied in the ECPA, amending the FPA, that altered the Commission's basic duties as authority for its interpretation.[43] FERC, relying on general principles of statutory construction, asserted that because the language of the FPA is ambiguous on the Commission's authority to order dam removal, the Commission is entitled to judicial deference in its reasonable interpretation of an ambiguous statute.[44]

Under the Supreme Court's decision in *Chevron v. Natural Resources Defense Council, Inc*,[45] the Court, when reviewing an agency decision, will pose two questions.[46] First, if the statute is clear and unambiguous, both the court and the agency are bound by the statutory language and the inquiry progresses no further.[47] If, however, the statute is less than clear the Court will uphold the agency's determination if it is permissible and reasonable, paying deference to the agency determination.[48] If the court undertakes the second level of analysis, it will look at the basis of the agency's decision on the entire record before the agency.[49] In this situation, the Commission has considerable support in the record, and in the process undertaken, in making

---

42. *See* FERC Project Decommissioning at Relicensing; Policy Statement, 60 Fed. Reg. 339 (1994).

43. *See id.* at 340:

> After examining the legislative history and the relevant statutory provisions, the Commission concludes that it has the legal authority to deny new licenses at the time of relicensing if it determines that, even with ample use of its conditioning authority, no license can be fashioned that will comport with the statutory standard under Section 10(a) of the Federal Power Act and other applicable law.

44. *See* Chevron v. Natural Resources Defense Council, Inc., 467 U.S. 837 (1984) ("The power of an administrative agency to administer a congressionally created program necessarily requires the formulation of policy and the making of rules to fill in any gap left, implicitly or explicitly, by Congress.") (quoting Morton v. Ruiz, 415 U.S. 199, 231 (1974)).

45. Chevron v. Natural Resources Defense Council, Inc., 467 U.S. 837 (1984).

46. *See id* at 842–43.

47. *See id.*

48. *See id.* at 844 ("We have long recognized that considerable weight should be accorded to an executive department's construction of a statutory scheme it is entrusted to administer, and the principle of deference to administrative interpretations.").

49. *See* Portland Audubon Soc'y v. Endangered Species Comm., Oregon Lands Coalition, 984 F.2d 1534, 1548 (9th Cir. 1992) ("Section 706 of the APA provides that judicial review of agency action shall be based on "the whole record." "The whole record" includes everything that was before the agency pertaining to the merits of its decision.") (quoting Thompson v. United States Dep't of Labor, 885 F.2d 551, 555-56 (9th Cir. 1989).

that determination.[50] The notice of inquiry presented by FERC directly requested comments on the issue,[51] and the comments received certainly establish the necessary reasonable basis to support the Agency's determination that it possesses the authority to order dam removal.

Secondly, FERC concluded that the legislative history of the Act indicated a shift in policy, favoring its interpretation of the Commission's authority to order dam removal.[52] FERC stated that it must be inherent in the FPA that the Commission has the authority to order dam removal, otherwise FERC would not be able to carry out its duties under the amended FPA of balancing environmental and economic considerations.[53] The Commission further argued that public policy no longer mandated the issuance of a renewal license upon every request, stating that the concerns surrounding dams and hydropower in 1920, when the FPA was passed, no longer dictated automatic license renewal.[54]

FERC cited community reliance on hydropower resources in the early 1900s as requiring automatic license renewal to avoid the catastrophic consequences of taking away a community's only power source.[55] Today, power is easily transferable over long distances and reliance is not based on single localized sources. In conclusion, the Commission stated that its ordinary conditioning authority might be inadequate in certain situations to meet the requirements of the amended FPA, and that the Commission in some situations might not be able to "condition" a project into compliance with the Act.[56]

Based on the Commission's interpretation of the statute and the stated policy considerations, FERC emphatically claimed the authority to order dam removal without compensation, and in certain situations, to place the burden of funding removal on the project owner.[57] FERC stated that to deny the Commission of such power would, in light of requiring the Commission to balance environmental and economic factors, impermissibly

---

50. *See* FERC Project Decommissioning at Relicensing; Policy Statement, 60 Fed. Reg. 339, 347–56 (1994).

51. *See* FERC Project Decommissioning at Relicensing; Notice of Inquiry, 58 Fed. Reg. 48,991 (1993).

52. *See* FERC Project Decommissioning at Relicensing; Policy Statement, 60 Fed. Reg. at 341 ("At the same time, section 10(a) has evolved since 1920. It no longer has the almost exclusively pro-development focus of the 1918–1920 period, when the original legislation was propelled by the largely undeveloped status of the country's water power resources. . . .").

53. *See id.* at 342.

54. *See id.*

55. *See id.*

56. *See id.* at 343.

57. *See id.* at 339.

"elevate power and other development interests far above the environmental concerns."[58]

The policy statement forcefully made two important declarations: (1) FERC has the authority to order removal of dams[59] and the restoration of the dam site to its original condition[60], and (2) that dam owners may be liable for the costs of removal.[61] Wielding an iron fist in a velvet glove, however, the tone of the Commission's statement, which is substantively uncompromising, takes apologetic and apprehensive tones at times during the discourse. For example, in attempting to soften its stance, FERC stated that denial of a new license would most likely occur only when dam owners would not agree to costly licensing conditions placed on an already uneconomic project. Later, the Commission, taking a harder line, stated that it would not waiver on imposing licensing conditions, even if they resulted in making the continuance of a project an economic impossibility for the owner.[62]

Opponents of FERC's stance on dam removal argue that nowhere does the FPA expressly provide the Commission with the authority to order the removal of an existing project without paying compensation, and that to do so would be a taking in violation of the Fifth Amendment.[63] In the comments received in response to the 1993 notice of inquiry issued by FERC on the question of its authority to order dam removal, opponents, mostly hydropower providers, argued that FERC had several options when decommissioning a project, but that none included involuntary decommissioning and removal of an existing dam at the cost of the owner.[64]

The opponents' contentions would leave FERC with more limited options. Under the FPA's voluntary surrender provisions, licensees may surrender their licenses to the Commission upon consent by FERC.[65] Voluntary surrender most often occurs when dam owners are faced with continuing the operation of a project that is no longer economical.[66] Upon surrender, licensees seeking to minimize their financial liability may attempt to avoid the expenses of removal and restoration under a surrender plan. Licensees may seek parties interested in purchasing and maintaining

58. *See id.* at 343.
59. *See id.* at 340.
60. *See id.* at 345.
61. *See id.* at 340.
62. *See id.*
63. *See id.* at 347.
64. *See id.*
65. *See* 16 U.S.C.A. § 799 (West 1998).
66. *See* FERC Project Decommissioning at Relicensing; Policy Statement, 60 Fed. Reg. at 339.

the dam for a non-power use.[67] These interested parties are often local governments having an interest in existing dams for purposes of maintaining a local water supply. Residential landowners whose properties are adjacent to an impoundment created by a dam may also have an interest in maintaining a project so that "lakefront" property remains "lakefront."[68]

Upon *expiration* of a license, FERC arguably has four possible options: (1) relicense the project with conditions to mitigate adverse environmental impacts; (2) federal takeover where the government agrees to operate an maintain the project; (3) issuance of a non-power license to parties interested in maintaining the project for some non-power use; or (4) license denial and non-consensual dam removal with the licensee paying the costs of removal and restoration.[69]

FERC's statement on financial liability upon the issuance of a removal order, leaves dam owners uncertain as to the extent of that liability and when it will be imposed. The Commission stated that a determination requiring a dam owner to fund dam removal would not be imposed in every situation, but would be made on a case-by-case basis.[70] The Commission indicated that it would take an uncompromising position if a determination was made that an owner was responsible for funding removal costs, even where liability for such costs was not required as a condition under the original permit.[71] In support of the Commission's policy on attaching financial liability to the project owner, FERC made an analogy to the surrender regulations of other federal agencies. Both the Bureau of Land Management and the Forest Service, require licensees to return federal

---

67. *See id.* at 342.

68. *See id.* at 344.

69. *See id.* at 341; Edward's Mfg. Co. and City of Augusta, Me., 81 F.E.R.C. 61,255 (1997).

70. *See* FERC Project Decommissioning at Relicensing; Policy Statement, 60 Fed. Reg. at 340:

> The commission will not generically impose decommissioning funding requirements on licensees. However, in certain situations, where supported by the record, the commission may impose license conditions to assure that funds are available to do the job when the time for decommissioning arrives. The commission will determine whether to impose funding requirements on a case-by-case basis, at the time of relicensing.

71. *See id*:

> Further, even in situations in which the commission does not impose a funding requirement at the time the project is relicensed, the licensee will ultimately be responsible for meeting a reasonable level of decommissioning costs if and when the project is decommissioned. The licensee should plan accordingly, and the Commission will not accept a lack of adequate preparation as justification for not decommissioning a project.

lands to their original condition upon surrender of a federally issued license or permit.[72]

## IV. CASE STUDIES OF TWO DAMS ORDERED REMOVED BY FERC

### A. *Removal of Dams in Washington State and Maine*

After a century-and-a-half, public policy's pro-development attitude toward dams is shifting toward removal and restoration of ecosystems and fisheries adversely affected by dam construction. Although hydroelectric power is a very efficient means of producing electricity,[73] the environmental costs associated with damming so many of America's rivers and the resulting harm to its fisheries and surrounding ecosystems have become a burden requiring the removal of some projects. The attributes of hydroelectricity cited by FERC—a power source free of air pollution, the renewability of the fuel-falling water, the long lives of hydro projects, and the immediate availability of energy—are now being outweighed by environmental considerations in some situations.[74]

FERC estimates that hydroelectric power, producing about 310.3 billion kilowatts of energy a year, saves 531 million barrels of oil annually.[75] But this cure-all approach to supplying the nation's increasing hunger for electric power has not lived up to its expectations. It is estimated that, despite all of the mitigation measures implemented, dams have contributed to the extinction of 106 native salmon and trout stocks in four Western states.[76] The adverse environmental effects attributed to dams include the destruction of fish spawning runs, fluctuations in water temperature, unnatural nutrient load and seasonal flows, the deposition and accumulation of sediment behind dams, and the degradation of delta wetlands caused by a lack of freshwater and saltwater intrusion.[77]

---

72. *See id.* at 345 n.45 ("Absent specific authority by the federal agency involved for continued use of federal lands at the termination of Commission licensing, it is eminently reasonable that the licensee must restore the lands to that agency's satisfaction, at the licensee's expense."). *See also id.* at n.46:

> It might be noted that the BLM and Forest Service rules specifically stated that: If the [permit] holder fails to remove all such structures or improvements within a reasonable period, as determined by the authorized officer, they shall become the property of the United States, but the holder shall remain liable for the cost of removal of the structures and improvements and for the restoration of the site.

73. *See* FERC, *Water Power, supra* note 4 (stating that the efficiency of today's hydroelectric plant is about ninety percent).

74. *See id.*

75. *See id.*

76. *See* Patrick Joseph, *The Battle of the Dams*, SMITHSONIAN MAG., Nov. 1998, at 51.

77. *See* Babbit, *supra* note 3.

Because of the sheer absurdity of retaining some aging dams on America's rivers, efforts have turned to removal and restoration of riparian ecosystems. In 1992, Congress passed the Elwha River Ecosystem and Fisheries Restoration Act (Elwha Act).[78] The Elwha Act provides for the government purchase and removal of two dams on the Elwha River on Washington State's Olympic Peninsula.[79] In 1994, FERC ordered the owners of the Edwards Dam on the Kennebec River in Augusta, Maine to remove the 160-year-old structure at the company's expense.[80] Both the Elwha and Kennebec are coastal rivers, and are home to various remnant populations of anadromous fish. Upon removal of the dams, anadromous fish will realize a significant gain in spawning habitat resulting in some recovery for these species whose decimation was contributed to by these dams.

### *B. Federal Condemnation of Privately Owned Dams: The Elwha and Glines Canyon Dams*

The Elwha River lies in the north-central section of the Olympic Peninsula Washington State, originating high in the Olympic Mountains and emptying into the Straight of San Juan de Fuca at the City of Port Angeles, a long time mill-town and fishing port. If one were to hike upstream along the Elwha River, the Elwha Dam and its adjoining works would be encountered 4.9 miles from the mouth of the river.[81] The Elwha Project lies just outside of Olympic National Park.[82] Above the Elwha Project is Lake Aldwell, the resulting impoundment. Upriver at 8.5 miles lies the Glines Canyon Dam, this portion of the project and its works are located on public and private lands lying partly within, and partly outside, Olympic National Park.[83] Behind the Glines Canyon project is Lake Mills. Together these two projects prevent anadromous fish from reaching seventy miles of riverbed that was once spawning habitat for the river's ten anadromous species, ninety-five percent of it lying within Olympic National Park.[84] The power produced by the Elwha and Glines Canyon Projects is

---

78. Elwha River Ecosystem and Fisheries Restoration Act, PUB. L. NO. 102-495, 106 Stat. 3173 (1992).

79. *See id.* § 3(a), 106 Stat. at 3174.

80. *See* Edward's Mfg. Co., Inc. & City of Augusta, Me., 81 F.E.R.C. 61,255 (Nov. 25, 1997).

81. *See* National Park Service, *Elwha River Summary Draft Environmental Impact Statement* (visited Jan. 18, 1999) <http://www.nps.gov/planning/olym/drftsum/elwha.htm>, at 4 [hereinafter *Elwha DEIS*].

82. *See id.* at 8.

83. *See* Elwha River Ecosystem and Fisheries Restoration Act, § 2(e), PUB. L. NO. 102-495, 106 Stat. at 3173.

84. *See* Brian Winter, *Restoring Ecosystem Processes: Dam Removal Awaited at*

consumed by a single pulp and paper mill located in Port Angeles.[85] The combined output satisfies only one-third of the power needs of this one plant.[86]

1. The Elwha River Ecosystem and Fisheries Restoration Act

In the Elwha Act, Congress directed the Secretary of the Interior to make a determination on whether the removal of the Elwha and Glines Canyon Dams was necessary to the "full restoration" of the Elwha River ecosystem and its anadromous fish stocks.[87] Upon a finding that dam removal was necessary, the Elwha Act authorized the Secretary to acquire both the Elwha and Glines Canyon Projects, and all interests in the dams, ownership or otherwise.[88] The Act appropriated $29.5 million for the acquisition of the two dams and appurtenant interests.[89] Under the agreement the dam owners and power consumers were absolved of all liabilities arising from the past or present effects of the dams upon transfer of their interests.[90] The Secretary, upon finding dam removal necessary to meet the goals of the Elwha Act, was then authorized to take such action as necessary to remove the dams to realize the full restoration of the Elwha River Ecosystem and its native anadromous fisheries.[91]

To prevent adverse affects on the parties relying on the projects, the Elwha Act contained several safeguards. The Secretary was to manage acquired lands, and protect the availability and existing water quality against adverse impacts arising from dam removal.[92] The Elwha Act also required the Administrator of the Bonneville Power Administration to ensure and deliver replacement power to the Port Angeles mill relying on the power generated by the Elwha and Glines Canyon Projects, at the rate paid by local preference customers.[93]

---

*Olympic*, NAT. RESOURCES YEAR IN REV. 1996 (visited Jan. 18, 1999) <http://www.aqd.nps.gov/pubs/yrrvw96/chapter5/telwha.htm>.

85. *See* Elwha River Ecosystem and Fisheries Restoration Act, § 2(f), PUB. L. NO. 102-495, 106 Stat. at 3174.

86. *See* Winter, *supra* note 84.

87. *See* Elwha River Ecosystem and Fisheries Restoration Act, § 3(a), Pub. L. No. 102-495, 106 Stat. at 3174.

88. *See id.*

89. *See id.*

90. *See id.* § 3(b), 106 Stat. at 1374.

91. *See id.*

92. *See id.* § 4(a) & (b), 106 Stat 3176.

93. *See id.* § 5(b), 106 Stat. 3177.

### *C. Ordering the Removal of Federally Licensed Dams: The Edwards Dam*

On July 1, 1999 church bells rang throughout Augusta, Maine announcing the breach of the Edwards Dam on the Kennebec River.[94] The Edwards Dam was a 160-year-old wooden structure spanning 917 feet across the Kennebec River in Maine's capital city.[95] The uses of the power generated by the Edward's Dam reflect the declining utilization of hydropower. The Edwards Dam was originally constructed by the Kennebec River Dam Co. in 1837, and in its heyday powered seven sawmills, a gristmill, and a machine shop.[96] The dam was purchased in 1882 by the Edward's Manufacturing Company to power a textile mill.[97] In 1980 the textile mill closed but in 1984 Edwards Manufacturing signed a lucrative fifteen year contract with Central Maine Power (CMP), which contracted to purchase the power generated by the Edwards Dam at an above market rate.[98] The dam owner's received $2.4 million annually from the CMP contract, the fair market value of the electricity produced was $900,000. Under the terms of a later agreement, the City of Augusta received $100,000 annually from the power produced by the dam.[99] In 1991, Edwards Manufacturing applied to FERC for a 50 year renewal license, a year later the City of Augusta became Edwards's co-licensee.[100] In 1993, the Edwards Dam license issued by FERC expired. FERC subsequently issued a series of annual permits allowing the project to continue operating.[101] Upon completion of two environmental impact statements, in 1996 and 1997, FERC recommended dam removal and denied Edwards' relicensing request.[102] The Dam was removed in July 1999, giving anadromous fish access to the longest stretch of migrating fish

---

94. *See* Dieter Bradbury, *A Dam Gives Way to hope as Dignitaries and Citizens Watch and Applaud as the Edwards Dam is Breached, But Some See it as a Bittersweet Day in History*, PORTLAND PRESS HERALD, July 2, 1990, at 1A.

95. *See* Edward's Mfg. Co. and City of Augusta, Me., 81 F.E.R.C. 61,255 (1997).

96. *See Changing River: History Behind the Decision*, KENNEBEC J. ONLINE, (July 13, 1998) (visited Feb. 11, 1999) <http://www.centralmaine.com/edwards/day2.html> [hereinafter *Changing River*]. CMP is a utility company supplying electricity to 500,000 residents of Southern and Central Maine.

97. *See id.*

98. *See id.*

99. *See* Dieter Bradbury, *U.S. Regulators Order Maine Dam Removed the Decision Will Open 17 Miles of Kennebec River Habitat to Migratory Fish, Which Have Not Had Access Since 1837*, PORTLAND PRESS HERALD, Nov. 26, 1997, at 1A.

100. *See Changing River, supra* note 96.

101. *See id.*

102. *See* Edward's Mfg. Co. and City of Augusta, Me.; Order Denying New License and Requiring Dam Removal, 81 F.E.R.C. 61,255 (1997).

spawning habitat north of the Hudson River for the first time since the dam was built.[103]

1. FERC Removal Order: The Edwards Dam

The owners of the Edwards Dam were ordered to remove the dam against their will, and at their own expense.[104] FERC ordered the dam removed pursuant to the authority the Commission declared in its 1994 policy statement, exercising this power for the first time.[105] Prior to issuing the removal order, public notice of the application for new license was given, comments were received, and timely motions to intervene were filed from various environmental and sporting organizations,[106] government,[107] and industry.[108] In addition to opposition from interest groups, there was considerable support within the state and federal governments against relicensing the Edwards facility.[109] The notice and comment period was a powerful mechanism for proponents of dam removal to influence FERC's determinations.

Several important findings were made by the Commission leading to the removal determination. The Commission found that the amount of power generated by the Edwards Project was minimal and could be immediately replaced by existing sources in the region, and in the long term by new resources.[110] Other key findings by FERC included the prospects of enhanced fishery resources and recreational opportunities,[111] the

---

103. *See Sierra Forests, Ruling Marks the Turning Point for River Restoration Efforts Nationwide* (visited Nov. 23, 1998) <http://www.sierraforests.org/html/edwards.html>.

104. *See* Edward's Mfg. Co. and City of Augusta, Me.; Order Denying New License and Requiring Dam Removal, 81 F.E.R.C. 61,255 (1997).

105. *See id.* ("For the reasons discussed below, we [FERC] deny the application for a new license, and we direct Edwards Manufacturing Company and the City of Augusta (licensees) to file a plan to decommission the hydroelectric generating facilities and remove the project dam.").

106. *See id.* Organizations included: Kennebec Valley Chapter of Trout Unlimited, Natural Resources Council of Maine, Atlantic Salmon Federation-Maine Chapter, American Rivers, Trout Unlimited, and Maine Council of Trout Unlimited. *See id.*

107. *See id.* Government comments received from: National Marine Fisheries Service (NMFS), United States Department of the Interior, United States Environmental Protection Agency, and Maine State Planning Office. *See id.*

108. *See id.* Industry comments received from: Scott Paper Company, UAH-Hydro Limited Partnership, Central Maine Power, Merimil Limited Partnership. *See id.*

109. *See id.* ("There is limited support for the licensee's application to relicense the Edwards Project. Maine Governor King, the Maine Departments of Marine Resources and Inland Fisheries and Wildlife, the State Planning Office, NMFS, Interior, EPA and the Kennebec Coalition all advocate license denial and dam removal.").

110. *See* Edward's Mfg. Co. and City of Augusta, Me.; Order Denying New License and Requiring Dam Removal, 81 F.E.R.C. at 61,255 (1997).

111. *See id.*

uneconomic nature of the operation,[112] the benefit to threatened and endangered species,[113] and the relative ease of mitigating adverse effects on water quality.[114]

The Commission's conclusion against relicensing focused on the negative impacts of the project that could not be mitigated.[115] These concerns included blocking upstream passage of five anadromous species of fish, including one endangered species, that do not, or are unable to, use fish ladders or other fish passage devices.[116] The Commission ultimately concluded that dam removal was the only option before it that was compatible with the "comprehensive" development requirement of section 10 of the FPA.[117]

2. A Legal Challenge to FERC's Authority?

Initially, the Edwards Manufacturing Company was prepared to fight FERC's removal order in court. The company said that it was at least going to seek compensation for its investment in the structure, valued at six million to ten million dollars.[118] The decree of the Commission requiring the Edwards Company to fund the removal was made a non-issue when a deal was negotiated with Bath Iron Work's (BIW), a local ship building firm, and the state of Maine to pay for the removal costs. Under the deal, BIW provided $2.5 million for the removal of the dam and for other fish enhancement projects on the Kennebec. The BIW offer was made as part of a mitigation plan required of the company for a dredging project that it was undertaking at its shipbuilding facility downstream on the Kennebec River in Bath, Maine.[119] These developments pacified the Edwards Manufacturing Company and no suit was filed.

As of March 3, 1999, FERC transferred the Edwards Dam license to the state of Maine, this transfer absolved the Edward's Manufacturing Co. of any liability for the costs of removing the project.[120] Any costs of removal not covered by BIW's contribution were met by the State.

---

112. *See id.*
113. *See id.*
114. *See id.*
115. *See id.*
116. *See id.*
117. *See id.*
118. *See* Bradbury, *supra* note 99, at 1A.
119. *See* Editorial, *BIW's Mitigation Plan For Kennebec on Target the Removal of Edwards Dam Alone Would be Highly Significant*, PORTLAND PRESS HERALD, Nov. 9, 1997, at 4C.
120. *See* Electronic mail from Steve Brooke, Project Coordinator, Kennebec Coalition to Peter J. Carney (March 11, 1999) (on file with the *Ocean and Coastal Law Journal*).

## V. ECOLOGICAL IMPACTS OF DAM REMOVAL

### A. *Benefits of Dam Removal*

Dam removal proponents seek to reverse the adverse effects that dams have caused to rivers, and ultimately seek to restore riverine and surrounding terrestrial ecosystems to their natural conditions. A publication by American Rivers, a conservation organization, lists the top ten reasons why dams damage rivers: reduction of water levels, blockage of the flow of rivers, the slowing of rivers, alteration of water temperatures, alteration of timing of flows, fluctuating reservoir levels, decreased oxygen levels in reservoir waters, sedimentation, the danger turbines present to migrating fish, and increased predator risk for migrating fish.[121] The combined effects of these impacts results in a complete alteration of native biotic communities and results in their replacement by communities composed of non-native and exotic species.[122]

Impoundments or reservoirs created by dams have dramatic and far reaching effects on both riverine and terrestrial communities. As dams are constructed and the waters behind a dam deepen, less light reaches the riverbed, altering the composition of, first, aquatic plant communities, and subsequently the fish and other species relying on those plant communities for food and protection.[123] Also, as the result of the changing depth of the water, water temperatures change.[124] In the upper water column temperatures rise and may be oxygen rich.[125] In deeper waters temperatures are cool and the amount of dissolved oxygen in the water is less.[126] Releases of water from dams will affect the downstream ecosystem as waters of varying temperature and oxygen levels are released, all of which cause stress on downstream inhabitants.[127] This inevitably leads to the displacement of native species by non-native species as fish dependent on fast-moving, cold water, disappear.[128] Species adapted to the new conditions will arrive to replace them, including bass, carp, walleye, shad, pike, and pickerel.[129]

---

121. *See* American Rivers, *Ten Reasons Why Dams Damage Rivers* (visited Mar. 24, 2000) <www.amrivers.org/dam10ways.html>.

122. *See* Ted Gup, *Dammed From Here to Eternity: Dams and Biological Integrity*, TROUT MAG., Winter 1994, at 15.

123. *See id.*

124. *See id.*

125. *See id.*

126. *See id.*

127. *See id.*

128. *See id.* at 18.

129. *See id.*

These replacement species disrupt the native fish and subject them to new forms of predation and greater competition for food and shelter.[130]

Dams also stop the natural flow of nutrients in the river, as leaves are no longer carried to awaiting insects, and the insects are no longer carried by the waters to foraging fish.[131] The presence of a dam results in the alteration of the river bottom downstream where finer elements are washed away leaving a coarse river bed affecting the ability of some invertebrates to survive in this new habitat.[132] These organisms—mayflies, stoneflies, and caddisflies—are essential food sources for species such as salmon and trout.[133] The flow regime employed by a dam operation may also lead to gravel being swept away from the riverbed, denying their use to fish species using such beds as spawning habitat.[134] Water releases by the dam lead to regular fluctuations of water temperature and water level, aggravating all of the above circumstances.[135]

The effects of dams are not limited to the riverbed itself; as water levels rise from new projects, large areas of riparian vegetation are submerged.[136] These submerged areas may include important wetland areas that are necessary to filter pollution and contaminants from runoff entering the river, and are also important elements in flood control.[137] Due to fluctuations in water level, plant communities located at the water's edge will often not reestablish themselves around the periphery of a dam project.[138] The water levels in impoundments may fluctuate up to forty feet,[139] resulting in periods of inundation and drying out that make it impossible for new plant communities to colonize. The same results may occur downstream as water releases raise and lower the water level, often leaving riverbanks bare or colonized by non-native species. In the case of coastal rivers, the effects may be as far reaching as ocean beaches and estuarine areas. The reduced amount of sediment being carried downstream results in less sediment being carried to ocean deltas. As a result, the composition of the beds of estuarine areas are affected, and the natural supply of sand replenishing ocean beaches is interrupted.[140]

---

130. *See id.*
131. *See id.* at 15.
132. *See id.*
133. *See id.*
134. *See id.* at 18.
135. *See id.* at 15.
136. *See id.*
137. *See id.*
138. *See id.*
139. *See id.*
140. *See id.* at 18.

### *B. Restoration of Anadromous Fish Habitat*

Due to many factors, one of which is dams, anadromous fish stocks on both the East and West Coasts have experienced serious decline or complete extinction.[141] As stated, the effects that dams have on water temperature, oxygen level, rate of flow, and composition of spawning beds will all affect the ability of adult and juvenile anadromous fish species to survive in these waters. It is noted that New England regional salmon stocks are at 1% of their historic levels, partly due to the fact that the regions rivers are blocked by over 900 dams denying fish access to their traditional spawning grounds.[142] As current marine fisheries management mechanisms are exhausted, or lose their effectiveness, the restoration of spawning habitat should play an important role in future management regimes. Increasing spawning habitat by restoring rivers to their natural conditions should result in larger fish stocks, benefitting ecosystems and commercial fishing concerns.

#### 1. The Kennebec River Environmental Impact Statement

The removal of the Edwards Dam will benefit nine species of migratory fish by freeing access to seventeen miles of historic spawning habitat on the Kennebec River. The Edwards dam is forty-four miles from the mouth of the Kennebec. Prior to building the dam, anadromous fish species migrated as far as eighty-nine miles up from the mouth of the river.[143] The species expected to benefit are shortnosed sturgeon, Atlantic sturgeon, striped bass, Atlantic salmon, alewives, rainbow smelt, blueback herring, American shad, and American eel.[144] Species destined to realize an even more substantial

---

141. *See, e.g., Elwha DEIS*, *supra* note 81, at 4. The Park Service stated:
Salmon populations in the Elwha River are not the only ones declining, nor are dams the only reason for their decline. Salmonid numbers in many rivers of the Pacific Northwest are falling for a variety of reasons. Some species are overfished, some are affected on a large scale by fluctuations in the marine environment, and some are affected by conditions in their freshwater habitat. Silt from logging, dredging for gold and from the public building and use of roads covers and smothers eggs. Water diversions for industrial, municipal or commercial use, and the addition of pollutants such as pesticides all increase fish disease and mortality. *Id.*

142. *See* Rita Haberman, *Dam Fights of the 1990's: Removals*, RIVER NETWORK, RIVER VOICES, Winter 1995, at 4.

143. *See* Federal Energy Regulatory Commission, Final Environmental Impact Statement, Kennebec River Basin, at 3-21 (July 1997) [hereinafter Kennebec EIS].

144. *See* Dennis Hoey, *Opponents of Dam Turn up the Pressure to Have it Removed*, PORTLAND PRESS HERALD, Jan. 29, 1997, at A1; *see also* Kennebec EIS, *supra* note 143, at 3-16 and 3-21 ("Resource agencies consider the Kennebec to be unique because it is the only river north of the Hudson River known to support reproducing populations of every anadromous fish species that is indigenous to the northeastern United States.").

benefit from dam removal, rather than alternative proposals, are shortnosed sturgeon, Atlantic sturgeon, striped bass, and rainbow smelt, none of which use fish ladders.[145]

Significant restoration of fish populations are anticipated with the removal of the Edwards Dam. For example, the Maine Department of Marine Resources seeks to restore a run of six million alewives to the Kennebec above the dam,[146] and a population of 690,000 shad.[147] Removal of the Edwards Dam has resulted in eleven miles of lacustrine habitat being transformed into a riverine ecosystem with pools, runs, and riffles with the flow fluctuations of a natural river.[148] Studies show that removal of the Edwards Dam will result in streamflows more suitable to sustaining fish populations.[149] Increased streamflows would directly benefit fish by providing more water during low flow periods, and by moderating summer high temperatures and low dissolved oxygen values that occur during low flow periods.[150]

2. The Elwha Environmental Impact Statement

The EIS prepared by the National Park Service for the removal of the Elwha and Glines Canyon Dams focuses on the return of anadromous fish to the Elwha River, and the resultant benefit to other species within the ecosystem.[151] Because the Elwha Dam was built only 4.9 miles from the mouth of the river, it eliminated 93% of the habitat the river once offered to anadromous fish.[152] Removing the dams would result in a net gain of 5.3 miles of riverine habitat, now inundated by Lakes Aldwell and Mills, and restore access to the entire seventy miles of river once used by migratory stocks.[153]

Prior to dam construction it is estimated that the Elwha River produced 380,000 migrating trout and salmon, today that number is estimated at 3000.[154] Since dam construction, all ten of the river's anadromous species

---

145. *See* NATURAL RESOURCES COUNCIL OF MAINE, SPECIAL REPORT: RESTORING THE KENNEBEC RIVER 2–3 (June/July 1997) ("Sturgeon are bottom dwelling fish. They do not migrate upstream past natural river barriers such as waterfalls and will not travel through fishways to bypass a dam . . . . [Striped bass] spawn only in fresh water and only in selective sites. Their large size prevents them from using fish passageways.").

146. *See* Kennebec EIS, *supra* note 143, at 3-22.

147. *See id.* at 3-25

148. *See id.* at 3-99 to 3-100, 4-134.

149. *See id.* at 5-21.

150. *See id.* at 4-19.

151. *See Elwha DEIS*, *supra* note 81, at 4.

152. *See id.*

153. *See id.* at 4–5

154. *See id.* at 4.

have declined considerably. The Park Service study found that dams, although not the only cause of fish mortality, were the primary cause. Statistics were offered showing that 85% to 95% of sea-bound smolts on the Columbia-Snake river system are killed as the result of passing through dams, and that 34% to 57% of adults returning to spawn meet the same fate.[155] In evaluating these statistics, it should be noted that this mortality rate occurred on the Snake-Columbia system despite the $1.5 billion spent over the last thirteen years to construct fish passage mechanisms.[156]

The positive ecological effects of removing the two dams on the Elwha will reach beyond the scope of the return of anadromous fisheries, to the restoration of aquatic and terrestrial ecosystems.[157] The dam structures and resulting impoundments cover a total of 684 acres that were once a combination of low elevation riparian communities and natural wetlands that are expected to return.[158] The study notes that interaction between anadromous fish and terrestrial wildlife communities are central components of ecosystem function in the region.[159] The study identified twenty-two species of wildlife that feed on salmon carcasses or eggs: dam removal will return this essential food source to the region.[160]

Considerable benefits are also expected beyond the river. Because the dams changed the composition of the sediments moving downstream in the river, the bed of the near-shore area at the mouth of the Elwha also changed in composition.[161] As a result, the species native to the Elwha delta were displaced and non-native species better adapted to the altered bed established themselves.[162] Various species of crabs and clams are expected to return once the bed of the near-shore area returns to its natural composition.[163] It is also expected that the natural transport of sediment will help restore coastal beaches that suffer from erosion due to the loss of sand from the Elwha River.[164]

A difficult decision with the Elwha removal project is how to manage the estimated 17.7 million cubic yards of silt that has accumulated in the two reservoirs.[165] Proposals include allowing the sediment to erode naturally, or dredging and conveying the sediment by pipeline to the

155. *See id.* at 5.
156. *See id.*
157. *See id.* at 12–14.
158. *See id.* at 14.
159. *See id.*
160. *See id.*
161. *See id.*
162. *See id.*
163. *See id.* at 15.
164. *See id.*
165. *See id.* at 9.

Straight of Juan de Fuca.[166] Allowing the sediment to erode naturally is the favored alternative because it would return the sediment, including spawning gravel, to the river downstream of the reservoirs, and improve the degraded river bottom.[167]

### *C. Potential Negative Environmental Effects of Dam Removal*

There is concern that removing longstanding dams may have adverse environmental impacts; compounding this concern are the unknown environmental impacts of dam removal.[168] The effects of dam removal may lead to the disappearance of newly formed upstream wetlands, and threaten established downstream habitats.[169] Concern arises over what will happen when sediment that has accumulated behind a dam is released. These sediments often carry concentrations of contaminants including agricultural pesticides, fertilizers, industrial wastes, and heavy metals.[170] This is of particular concern in the case of the Edwards removal, where the Kennebec River has long been subject to releases of waste water emitted by paper mills in New Hampshire and Maine.[171]

The concern over contaminated sediment has been somewhat alleviated in regard to the removal of the Edwards Dam. Testing found concentrated levels of arsenic and cadmium in the sediment behind the impoundment.[172] Prior to removal, it was determined that the former impoundment did not prevent the downstream disbursement of these contaminants.[173] Samples from below the dam showed that these contaminants were already present in the downstream riverbed.[174]

There is concern over the impacts that dam removal will have on various species that have established themselves after the construction of dams, or have adapted to its presence, and as a result of dam removal may suffer some level of disruption.[175] Several non-native species have established themselves in the Kennebec.[176] Thus, there is concern over the changing composition and balance of native communities within the ecosystem.[177] This is especially true where species that have established

166. *See id.* at 9–10
167. *See id.* at 10.
168. *See* Gup, *supra* note 122, at 18.
169. *See id.* at 19.
170. *See id.* at 18.
171. *See* Kennebec EIS, *supra* note 143, at 3-80 to 3-82.
172. *See id.* at 4-18
173. *See id.*
174. *See id.*
175. *See id.* at 5-21.
176. *See id.* at 3-100 to 3-102.
177. *See id.* at 4-134 to 4-135.

themselves are either rare or endangered. For example, in a peculiar twist in the Edwards saga, although not fatal to the plan to remove the dam, was the identification of several species of rare shellfish below the dam.[178] Another example, is the effect that dam removal will have on eagles that are present along both the Elwha and Kennebec Rivers.[179]

## VI. "TAKINGS" ISSUES PECULIAR TO DAM REMOVAL ORDERS

Dam removal raises many interesting "takings" questions under the Fifth Amendment. The litigable interests include the physical taking of property, the deprivation of certain privileges created by a government license, the possibility that rights may be acquired from the government's artificial maintenance of a situation for such an extended period of that in a sense that condition becomes "natural," and the reduction of property values resulting from something other than some physical intrusion on private property.

### *A. General Takings Analysis*

The Fifth Amendment of the United States Constitution requires the government to pay "just compensation" upon "taking" property from private owners.[180] A "taking" may occur when the government exercises its power of eminent domain resulting in a physical condemnation of the land,[181] or may encompass a "regulatory taking" where, by virtue of government regulations, a landowner is deprived of value in property because of limitations on how the property might be used.[182]

The general rule announced by the Court in *Pennsylvania Coal Co. v. Mahon*,[183] is "that while property may be regulated to a certain extent, if regulation goes too far it will be recognized as a taking."[184] This rule has been substantially refined in the subsequent cases of *Lucas v. South Carolina Coastal Council*,[185] and *Dolan v. City of Tigard*.[186] The *Lucas* and *Dolan* cases have resulted in essentially two categorical rules. The rule

178. *See* Dave Cheever, *Rare Mussel Puts Crimp in Dam Plan*, KENNEBEC J., July 1, 1998.

179. *See* Kennebec EIS, *supra* note 143, at 4-135; *Elwha DEIS*, *supra* note 81, at 14.

180. *See* U.S. CONST. amend. V.

181. *See* RICHARD A. EPSTEIN, TAKINGS: PRIVATE PROPERTY AND THE POWER OF EMINENT DOMAIN, 57 (1985).

182. *See id.* at 263.

183. Pennsylvania Coal Co. v. Mahon, 260 U.S. 393 (1922).

184. *Id.* at 415.

185. Lucas v. South Carolina Coastal Council, 505 U.S. 1003 (1992).

186. Dolan v. City of Tigard, 512 U.S. 374 (1994).

announced in *Lucas* has three important components: (1) if the property owner is deprived of 100% of the value of the land compensation is required; even (2) where the value is taken by a legitimate exercise of the police power; and (3) an exception to this rule is that the owner will not be compensated where no vested property interest was held by the owner, such as in the case of nuisance law, no property owner has an inherent right to create and maintain a nuisance.[187] Under *Dolan,* a regulation depriving a property owner of less than 100% of the value of the land may require compensation if the regulation imposed does not have a direct relationship to the ends it seeks to achieve.[188] Conversely, if the nexus between the regulation and the ends sought are sufficiently related, no compensation is required.[189]

1. Analysis of Property Interests Claimed by Dam Owners

Dam owners ordered to remove dams by a government agency may set forth a number of takings claims. The owner's most obvious claims would arise from takings of project lands and structures, the value of the government issued license, and the deprivation of the value or use of power produced by the project. The Court's tests from *Lucas* and *Dolan* indicate that, in most circumstances, owners of dam projects will not be entitled to compensation.

Whether a dam owner is entitled to compensation for the value of project lands will depend on the nature of the removal order. In a case such as Edwards, the licensee was not deprived of the project lands. The removal order required Edwards to take away the dam, but did not order surrender of the lands where the works were located.[190] The company has also not been deprived of 100% of the value of the land; the land still has many other uses other than holding the associated works of a dam.[191] In addition, FERC's rationale for removing the dam has a direct relationship to ends it seeks to achieve, restoring fish habitat. Thus, there is a sufficient nexus that no taking will be found under *Dolan.*

With regard to the dam structure, the owner will also generally not have a claim. Any navigable water of the United States is subject to the government's superior exercise of the navigation servitude.[192] On all navigable waters in the United States the government has the right, superior

187. *See* Lucas v. South Carolina Coastal Council, 505 U.S. at 1003.
188. *See id.* at 386.
189. *See id.*
190. *See* Edward's Mfg. Co. and City of Augusta, Me., 81 F.E.R.C. 61,255 (1997).
191. *See id.*
192. *See* Lewis Blue Point Oyster Co. v. Briggs, 229 U.S. 82, 87 (1912).

to all others, to take all acts necessary to improve the navigability of the nation's waterways.[193] Although the owner of a dam may hold a license to place a dam on a navigable waterway, under the principle announced in *Lewis Blue Point Oyster Co. v. Briggs*,[194] the government may exercise its dominant power under the navigation servitude and order the dam removed without being required to pay compensation to the project owner.[195] The government's authority to order such uncompensated removals is found in the Commerce Clause of the Constitution, giving the federal government the power to regulate arteries of interstate commerce.[196]

In *Lewis*, the Supreme Court held that implicit in the navigation servitude is that title to submerged lands is subject to the government's interest in improving navigation.[197] The Court also held that no private property was taken entitling the plaintiff to compensation for loss of value resulting from the exercise of the government's dominant power.[198] The scope of the navigation servitude is broad; compensation is not required even where the government's primary goal is not aiding navigation. The doctrine requires only that the action aid navigation in some way, even if aiding navigation is only an incidental goal.[199]

A dam owner may also argue that by acquiring a license to install and operate a project a property right in that license becomes vested in the licensee. Property interests were once only found in land and chattels, but as government regulation has increased new philosophies of what constitutes property have emerged.[200] Interests protected under the common law were given the weight of "rights," and were, therefore, afforded protection. Property interests created by other means, such as statute, were characterized merely as "privileges" that were not entitled to protection.[201] Eventually, the strict distinction between "rights" and "privileges" began to erode as courts sought to afford procedural protection to non-traditional interests, thus, widening the scope of constitutional protection.[202]

As property interests in "privileges" grew in social importance it was necessary to broaden the traditional notion of rights, or vested interests.[203] To accomplish this it was necessary to take a new view of wealth as it

193. *See id.*
194. Lewis Blue Point Oyster Co. v. Briggs, 229 U.S. 82 (1912)
195. *See id.* at 88.
196. *See* U.S. CONST. art. I, § 8, cl. 3.
197. *See id.* at 88.
198. *See id.*
199. *See* Oklahoma v. Atkinson, 313 U.S. 508, 534 (1941).
200. *See generally* Charles A. Reich, *The New Property*, 73 YALE L.J. 733 (1964).
201. *See id.* at 740.
202. *See id.* at 741.
203. *See id.* at 739 ("As government largess has grown in importance, quite naturally there has been pressure for the protection of individual interests in it.").

related to property. It was argued that a considerable amount of wealth in the United States was no longer found in personal property, but was in the form of governmental benefits not falling into traditional common law conceptions of property.[204] The essential nature of these government benefits, and the scale on which government provided jobs, welfare assistance, services, contracts, and licenses required the conclusion that interests in these government created sources of wealth should be protected by the same procedural safeguards attached to traditionally recognized forms of property.[205] A license is a form of governmentally conferred benefit. A duration of a license, however, is not infinite and when the license expires the property interest is extinguished.[206]

Dam owners may also argue that a property right is acquired in water power and its ability to produce a valuable commodity such as electricity. But can a property interest be acquired in the flow of water? The Supreme Court says no—the United States's superior navigation easement precludes private ownership of the water or its flow.[207] The exclusion of riparian owners from the benefits of the power in a navigable waterway without compensation is entirely within the government's discretion.[208]

### *B. Do Riparian Land Owners Have a Property Interest in the Artificial Maintenance of the Level of a Reservoir Requiring Compensation If Taken?*

In an experience with dam removal on the Au Sable River in Michigan, residents who owned property fronting an upstream impoundment were vocal over the possible decline in property values if the dam was removed and the impoundment drained.[209] In the Supreme Court's decision in

---

204. *See id.*

205. *See id.* at 739.

206. *See* Ruckelshaus v. Monsanto Co., 467 U.S. 986, 1001 (1984) ("[P]roperty interests, of course, are not created by the Constitution. Rather they are created and their dimensions are defined by existing rules or understandings that stem from an independent source . . . independent sources that secure certain benefits and that support claims of entitlement to those benefits.") (quoting Board of Regents of State Colleges v. Roth, 408 U.S. 564, 577 (1972)); Sinclair Pipe Line Co. v. United States, 287 F.2d 175, 177 ( Ct. Cl. 1961); Acton V. United States 401 F.2d 896, 899 (9th Cir. 1968).

207. *See* United States v. Grand River Dam Auth., 363 U.S. 299 (1960).

208. *See* United States v. Twin City Power Co., 350 U.S. 222, 225–26 (1956).

209. *See* Haberman, *supra* note 142,at 5. *See also* FERC Project Decommissioning at Relicensing; Policy Statement, 60 Fed. Reg. 339, 343 (1994):

> For example, there can be great environmental consequences to tearing out a dam that is part of a licensed hydropower project. Over the life of the project huge amounts of silt may accumulate, and if the dam is removed, that silt may sweep downstream, causing major damage to other properties or resources. The situation is even more serious where PCB's or other hazardous materials are embedded in the sediment.

*United States v. Kansas City Life Ins. Co.*,[210] the Court held that, under the Commerce Clause, the United States has the power to improve its navigable waters in the interest of navigation without liability for damages resulting to private property within the bed of a navigable stream, and that the limit of the stream bed is the ordinary high water mark.[211] In *Kansas City Life*, an owner of riparian land along the Mississippi River sought compensation for the reduced market value of the land adjacent to the river because it was no longer suitable for agricultural purposes.[212] The United States Government artificially maintained the Mississippi continuously at its high water mark in the interest of navigability. As a result, water percolated up into adjacent agricultural lands destroying crops growing there.[213] The first issue in the case was whether the United States, in the exercise of its power to regulate commerce, may raise a navigable stream to its high water mark and maintain it continuously at that level in the interest of navigation, without liability for the effects of that change upon private property beyond the bed of the stream.[214] Secondly, if the government was without the ability to do so, without such liability, whether the resulting destruction of the agricultural value of the land affected, without overflowing it, is a taking under the Fifth Amendment.[215]

The Court first held that the United States was immune from liability only for damage caused below the high water mark of the stream, and that the protection afforded by the navigability servitude did not extend to damage caused to private property above the high water mark.[216] In determining liability for the damage caused by percolation, the Court analyzed other cases where damage occurred above the high water mark.[217]

In *United States v. Willow River Power Co.*,[218] the Court held that the flooding of land above the high water mark was a taking that required compensation.[219] The Court was hesitant to find liability in *Kansas City Life* because the plaintiff's damage was not caused by flooding, but by percolation.[220] The Court in *Kansas City Life*, however, found that percolation was sufficiently similar to flooding as to require compensation.[221] The Court explicitly limited its holding to cases where

210. United States v. Kansas City Life Ins. Co., 339 U.S. 799 (1950).
211. *See id.* at 804–05.
212. *See id.* at 800.
213. *See id.* at 801–03
214. *See id.* at 801–02.
215. *See id.* at 801.
216. *See id.* at 805.
217. *See id.*
218. *See* United States v. Willow River Power Co., 324 U.S. 499 (1945).
219. *See id.* at 509.
220. *See* United States v. Kansas City Life Ins. Co., 339 U.S. at 810.
221. *See id.*

damages were caused by some "actual invasion."[222] The Court stated: "The destruction of land value, without some actual invasion of the land and solely by preventing the escape of its own surface water, is not before us."[223] This case holds that the United States Government is liable for the loss of value of land adjacent to rivers when that loss of value is the result of some physical intrusion upon a private landowner's property above the high water mark of a navigable stream. The Court, however, reserved the question of whether compensation would be required for loss of value where there were no physical intrusion, such as in the case of lowering a water level due to the removal of a dam, for another day.[224]

## VII. COMMON CHARACTERISTICS COMPELLING DAM REMOVAL

The first necessary element in dam removal is FERC's relicensing procedure, which subjects current operations to the environmental review imposed by the ECPA, and that also provides the opportunity for removal proponents to present their arguments and recommendations through public comment. During this process FERC must also consider the recommendations of other federal agencies such as the National Park Service, the United States Fish and Wildlife Service, and the recommendations of state agencies who may be against relicensing.[225] As shown in recent dam relicensing processes, the recommendations of other federal and state agencies may carry tremendous influence when FERC is deciding to relicense an existing project.[226] This is especially true when these agencies have a direct interest in seeing dams removed, such as the case of fisheries management agencies and the National Park Service.

Bruce Babbitt, Secretary of the Interior, cited several characteristics as common to prior and ongoing dam removals. He specifically listed age, location, huge environmental costs, and low generation.[227] FERC has indicated that the two factors carrying the greatest weight when making a relicensing determination include economic considerations, and extreme environmental considerations that cannot be mitigated by imposing

---

222. *See id.*

223. *Id.*

224. *See id.* at 810.

225. *See* 16 U.S.C.A. § 803(a)(2)(B) (West 1985 & Supp. 1999).

226. *See, e.g.*, Edward's Mfg. Co. and City of Augusta, Me., 81 F.E.R.C. 61,255 (1997) ("All comments received from interested agencies, organizations, and individuals have been fully considered in determining what action to take on the application for a new license in this proceeding."); *see generally* FERC Project Decommissioning at Relicensing; Policy Statement, 60 Fed. Reg. 339 (1994); *see also* FERC Project Decommissioning at Relicensing; Notice of Inquiry, 58 Fed. Reg. 48,991 (1993).

227. *See* Babbit, *supra* note 3.

permitting conditions.[228] Both the Elwha projects and the Edwards project were economically unproductive. The contract that Edwards Manufacturing had with Central Maine Power expired, and it was unlikely that any new purchaser could have been found that was willing to pay the favorable terms that Edwards had negotiated with CMP.[229]

Likewise, the economic benefits of the project on the Elwha were minimal at best. The combined power output of these dams provide only one-third of the power required to operate one area mill.[230] The fact that the electricity produced by these projects was minimal should dispel any argument that greater environmental harm will occur as the result of replacing hydropower sources with other power sources such as those requiring the burning of fossil fuels. Both of these projects produced such a negligible amount of power that to retain them for their power output would not be rational in light of the major roles that the Kennebec and Elwha play in their regional ecosystems.

Dam projects on both the Kennebec and Elwha resulted in massive disruption of the natural systems taking place in the region. Both of these rivers are major regional drainages, and any changes to the rivers have broad reaching effects on their regional ecosystems. Both rivers were once home to large populations of anadromous fish, an essential regional food source. In both instances, it is believed that dam removal will result in substantial recovery to these sea-running species. In both of these situations, the ecological integrity and the economic value of healthy fisheries far outweigh the benefits of the dams in light of their minimal output.

EIS's for both rivers indicated that there was a high probability of successfully restoring the involved riparian corridors if dams were removed.[231] The EIS completed for the Elwha stated that the river was a prime candidate for dam removal because other than the presence of the dams, the river was in pristine condition.[232] Unlike some other rivers, the probability of restoring the Elwha to its pre-dam condition was likely, thus this worked in favor of removing the Elwha projects. Other rivers, that have little likelihood of being rehabilitated because problems go beyond the scope of dams and reach into areas such as pollution or contamination, are less likely to see dams removed. The EIS's prepared for both the Elwha and Kennebec rivers also indicated that environmental benefits would

228. *See* Project Decommissioning at Relicensing; Policy Statement, 60 Fed. Reg. at 340.

229. *See* NATURAL RESOURCES DEFENSE COUNCIL, *supra* note 2.

230. *See* Winter, *supra* note 84.

231. *See Elwha DEIS, supra* note 81, at 5; *see generally* Kennebec EIS, *supra* note 143.

232. *See Elwha DEIS, supra* note 81, at 5.

extend beyond the river itself as coastal beaches would see an increase in deposited sand, river deltas would return to their natural states, and continuity in the regional food chain would return.[233]

## VIII. CONCLUSION

As the preceding analysis has shown, the varied conditions necessary for dam removal are coalescing and overpowering arguments for dam retention on America's largest, most economically and environmentally important rivers. The fact that the tide is turning in favor of a more balanced approach to economic and environmental considerations is apparent in the evolving philosophy of governmental policy concerning dams, most recently manifested in the ECPA and FERC's removal order for the Edwards Dam on the Kennebec River. Also playing an important role, are the economic interests of other parties in the dam removal controversy. As resources are no longer perceived as endless, but extraordinarily limited, and requiring numerous regulations schemes to provide for their allocation, the interests of various parties will be pitted against each other in determining the fate of dams during future relicensing processes.

Dam removal, however, is only one tool to be utilized in ecosystem restoration. Dam removal, although essential to environmental restoration in some situations, should not be heralded as a cure-all for environmental ills. To realize the full potential of benefits to the environment and associated economic concerns, we must also look at the effect that other activities are having on riparian watersheds, such as poor agricultural and logging practices. It doesn't make sense to put so much effort into dam removal efforts and then subsequently fail in mitigating other harms that may negate the benefits realized by dam removal. Regional ecosystem restoration efforts must be approached holistically, dam removal may be a catalyst to adopting this view.

---

233. *See Elwha DEIS, supra* note 81, at 15; *see generally* Kennebec EIS, *supra* note 143.