

Reviewing Reservoir Operations: Can Federal Water Projects Adapt to Change?

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Because of the scale of dam construction that has taken place in the United States, society now has before it a set of choices regarding the kind of river characteristics we desire. Like it or not, we control the destiny of these streams. . . .

....

Once a dam has been built, we reap its benefits and learn to live with the environmental effects. The real question then becomes: can a dam be operated so as to maximize its benefits and minimize its costs? The exciting answer is “maybe.”¹

I. INTRODUCTION

The Army Corps of Engineers (“Corps”) and the Bureau of Reclamation (“Bureau”) spent much of the twentieth century building large dams that dramatically altered the nation’s rivers.²

1. MICHAEL COLLIER ET AL., U.S. GEOLOGICAL SURVEY, CIRCULAR NO. 1126, DAMS AND RIVERS: A PRIMER ON THE DOWNSTREAM EFFECTS OF DAMS 1, 6 (2d ed. 2000).

2. The United States has around 75,000 dams, but a small subset of large dams accounts for a majority of the nation’s reservoir storage capacity. William L. Graf, *Dam Nation: A Geographic Census of American Dams and Their Large-Scale Hydrologic Impacts*, 35 WATER RESOURCES RES. 1305, 1306 (1999). Dams affect rivers throughout the United States, “but greatest surface water impacts are in the Rocky Mountains, Great Plains, and Southwest,” and “the construction and operation of dams has already had greater hydrologic and ecologic impacts on American rivers than any changes that might reasonably be expected from global climate changes in the near future.” *Id.* at 1309.

The Corps, which remains part of the U.S. Army despite its emphasis on civil works, constructed dams across the nation, primarily for flood control.³ The Bureau, an agency within the Interior Department, built dams in seventeen states from the Great Plains to the West Coast, primarily for water supply.⁴ These agencies combined for well over a thousand dams, with the Corps building somewhat over half of them.⁵

The “big dam era” of federal water policy may have ended decades ago,⁶ but the dams that went up in that era are still in place today. These dams form reservoirs that provide a range of benefits including water supply, flood control, and hydropower, and whatever the arguments in favor of taking out some specific ones, few if any major federal dams will be removed anytime soon. Yet each existing dam faces an important question about its future: should it be operated differently than it is now?

Every reservoir stores and releases water to serve specific purposes, and an operating plan directs the timing and rate of storage and releases from a particular reservoir. Many federal water projects—dams, reservoirs and associated facilities—have operating plans that are decades old, because the projects were built at least forty years ago and their plans have not been significantly revised since they were fairly new. The Corps and the Bureau, along with existing project beneficiaries, might argue that

3. See A. Dan Tarlock, *A First Look at a Modern Legal Regime for a “Post-Modern” United States Army Corps of Engineers*, 52 U. KAN. L. REV. 1285, 1299–1307 (2004) (summarizing the Corps’ historical evolution as a water resources development and management agency).

4. These seventeen states are the six Great Plains states from North Dakota south to Texas, the three West Coast states of the lower forty-eight, and the eight Intermountain West states. See 43 U.S.C. § 391 (2012).

5. The Bureau built more than 600 dams, while the Corps claims nearly 700. U.S. Bureau of Reclamation, *About Us*, RECLAMATION, <http://www.usbr.gov/main/about/> [<https://perma.cc/955N-4UV6>] (last updated Nov. 28, 2016); *Dam Safety Program*, U.S. ARMY CORPS OF ENG’RS, <http://www.usace.army.mil/Missions/CivilWorks/DamSafetyProgram.aspx> [<https://perma.cc/JGS7-S9CH>] (last visited Feb. 10, 2017).

6. “Reclamation’s last really big project construction authorization occurred in 1968 when Congress approved the Colorado River Basin Project Act which included, among others, the Central Arizona Project, the Dolores Project, the Animas-La Plata Project, and parts of the Central Utah Project.” U.S. BUREAU OF RECLAMATION, BRIEF HISTORY: BUREAU OF RECLAMATION, at 5 (2011). Historian Donald Pisani has written that the Bureau’s dam-building era ended in the 1970s, and has offered several reasons why the end came, including environmental concerns and fiscal constraints. Donald J. Pisani, *Federal Reclamation Law in the Twentieth Century: A Centennial Retrospective*, in U.S. DEP’T OF THE INTERIOR, 2 THE BUREAU OF RECLAMATION: HISTORY ESSAYS FROM THE CENTENNIAL SYMPOSIUM 611, 625 (2008) [hereinafter HISTORY ESSAYS VOL. 2].

projects continue to perform just fine under the existing operating plans, and “if it ain’t broke, don’t fix it.” But there are good reasons for the agencies to revisit the old plans, because their reservoirs operate in such a dramatically changing context.

First, the area served and affected by a federal water project may have changed greatly since the project was built. This is especially likely to be true in the West, which has experienced such rapid population growth in recent decades.⁷ Population growth may mean changes in water demands, land use, the local economic base, and local values and priorities in relation to water resources. A community that was small, rural, and resource-dependent in 1960 may now be far larger and more urban (with growing demands for public water supply), and may well place much greater weight on environmental and recreational amenities.

Second, the legal and policy context has evolved significantly since the Corps and Bureau built most of their projects.⁸ Congress in 1968 established a national program for preserving outstanding rivers,⁹ and today the National Wild and Scenic Rivers System includes more than 200 rivers, comprising over 12,700 miles of rivers across forty states.¹⁰ The 1970s brought increasing environmental awareness and a series of major federal laws including the National Environmental Policy Act, Clean Water Act, and Endangered Species Act, helping bring about the end of the big dam era.¹¹ Congress later made environmental concerns a

7. In the 2000–2010 decade, for example, the only five states to experience greater than 20% population growth were in the West: Nevada, Arizona, Utah, Idaho, and Texas, in that order. The two states that added the most people were Texas and California. PAUL MACKUN ET AL., U.S. CENSUS BUREAU, POPULATION DISTRIBUTION AND CHANGE: 2000 TO 2010, at 2 (2011).

8. These agencies themselves are no longer the single-minded dam builders that they were in an earlier day, as reflected by the way they describe their missions. On the Corps’ website, the “About” page quickly mentions “environmental sustainability as a guiding principle” in the agency’s diverse activities. *About Us*, U.S. ARMY CORPS OF ENG’RS, <http://www.usace.army.mil/About> [https://perma.cc/YH43-Q42R] (last visited Feb. 10, 2017). “The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.” *About Us—Mission/Vision*, RECLAMATION, <http://www.usbr.gov/main/about/mission.html> [https://perma.cc/YEV2-3CFS] (last updated Jan. 12, 2016).

9. Wild and Scenic Rivers Act, Pub L. No. 90-542, 82 Stat. 906 (1968) (codified at 16 U.S.C. §§ 1271–87).

10. *A National System*, NAT’L WILD & SCENIC RIVERS SYS., <https://www.rivers.gov/national-system.php> [https://perma.cc/8QZ2-3AGW] (last visited Feb. 10, 2017).

11. See Andrea K. Gerlak, *Federalism and U.S. Water Policy*, in *FEDERAL RIVERS: MANAGING WATER IN MULTI-LAYERED POLITICAL SYSTEMS* 41, 44–45 (Dustin Garrick et al. eds., 2014).

greater priority for the Corps,¹² for the Bureau in some areas,¹³ and for the Federal Energy Regulatory Commission, the agency that licenses hydropower dams.¹⁴ State water laws, too, have been moving in the direction of greater recognition of environmental and recreational values, even in the arid West with its tradition of promoting water development and maximizing “beneficial use.”¹⁵

Third, science has advanced significantly, providing better understanding of the positive and negative effects of dam operating practices on the downstream environment.¹⁶ Much of the research has focused on identifying and addressing the effects of dam operations on particular fish species, helping ensure that downstream flow regimes better meet the needs of the species throughout their life cycles.¹⁷ Other studies have identified operating practices that can help support recruitment and establishment of native riparian trees downstream of dams.¹⁸ Experimental high-flow releases from the Bureau’s Glen Canyon Dam have focused largely on rebuilding beaches along the Colorado River through the Grand Canyon.¹⁹ While site-specific research is needed to ascertain the specific effects of a change in dam operating practices,²⁰ agencies now can design operating

12. See Tarlock, *supra* note 3, at 1308–11 (describing growth of the Corps’ ecosystem restoration mission).

13. See Reed D. Benson, *New Adventures of the Old Bureau: Modern-Day Reclamation Statutes and Congress’s Unfinished Environmental Business*, 48 HARV. J. ON LEGIS. 137, 167–68 (2011) (noting basin-specific environmental enactments relating to the Bureau).

14. See Michael C. Blumm & Viki A. Nadol, *The Decline of the Hydropower Czar and the Rise of Agency Pluralism in Hydroelectric Licensing*, 26 COLUM. J. ENVTL. L. 81, 87–88 (2001) (summarizing 1986 amendments to the Federal Power Act giving greater weight to fish and wildlife values in hydropower licensing decisions).

15. Probably the most important movement in this regard is the rise of state laws allowing for protection of water left flowing in its natural course, primarily to protect fish and wildlife habitat. Such “instream flow” laws have been called “the most dramatic innovation” in the water law of the western states. Gregory J. Hobbs, Jr., *Priority: The Most Misunderstood Stick in the Bundle*, 32 ENVTL. L. 37, 47 (2002).

16. See generally COLLIER ET AL., *supra* note 1 (describing general advances in scientific understanding and outlining case studies involving a variety of rivers).

17. ALLAN LOCKE ET AL., *INTEGRATED APPROACHES TO RIVERINE RESOURCE STEWARDSHIP* 356–81 (2008) (describing a variety of studies on the impacts of various flow regimes, including flows below certain dams, on particular fish species).

18. Stewart B. Rood & John M. Mahoney, *Revised Instream Flow Regulation Enables Cottonwood Recruitment Along the St. Mary River, Alberta, Canada*, 7 RIVERS 109 (2000).

19. COLLIER ET AL., *supra* note 1, at 63–79 (describing 1990s studies regarding Colorado River flows below Glen Canyon Dam).

20. See C.P. Konrad et al., *Evaluating Dam Re-Operation for Freshwater Conservation in the Sustainable Rivers Project*, 28 RIVER RES. APPLICATIONS 777, 780–81 (2012).

regimes based on more complete information about the expected consequences.

Fourth, climate change has serious implications for dam operating plans. The implications may be most obvious for water supply reservoirs in the Southwest, which is expected to see decreases in average annual precipitation due to climate change.²¹ Long-term changes in the form of precipitation (from snow to rain), and in the timing of peak runoff, will also influence operating schedules. Climate change may also affect hydropower in various ways, most obviously by reducing generation in areas where annual flows decline. If extreme precipitation events become even more severe, as predicted, that too will pose a challenge for flood control operations. Warmer water and air temperatures may place additional stress on aquatic ecosystems, especially those that support important cold-water fisheries. Even this partial and highly simplified list of potential consequences suggests that climate change is a compelling reason to revisit the long-term operating plans of federal water projects.²²

Even before climate change became a front-burner issue in water management,²³ water policy experts were calling for review of water project operations. The National Water Commission, in its visionary 1973 report, declared that an “obvious way to make better use of existing water supplies is to provide for adapting existing projects to changing needs,”²⁴ and called for periodic review of federal project authorizations where needed to provide the necessary flexibility.²⁵ A U.S. Geological Survey report on dam

21. Michael Dettinger et al., *Western Water and Climate Change*, 25 *ECOLOGICAL APPLICATIONS* 2069, 2071 (2015).

22. Much has been written on this subject in recent years, but a useful national summary of potential impacts appears in LEVI D. BREKKE ET AL., U.S. GEOLOGICAL SURVEY, CIRCULAR NO. 1331, *CLIMATE CHANGE AND WATER RESOURCES MANAGEMENT: A FEDERAL PERSPECTIVE* 5–11 (2009).

23. The final report of the Western Water Policy Review Advisory Commission, issued in 1998, documented many ways in which the American West was changing, but said little about climate change. The report did mention a “growing body of research indicating that many parts of the region may experience reduced water availability, especially during the high-demand summer months,” as well as a growing risk of floods. W. WATER POLICY REVIEW ADVISORY COMM’N, *WATER IN THE WEST: CHALLENGE FOR THE NEXT CENTURY*, at 2-1–2-3 (1998).

24. NAT’L WATER COMM’N, *WATER POLICIES FOR THE FUTURE* 229 (1973).

25. The Commission’s basic rationale for recommending review of existing federal projects was that the nation’s water priorities and challenges had changed significantly:

impacts carefully avoided calling for changes in existing project operations, but made a strong case that decision-makers could employ new science in developing operating regimes that would reduce downstream environmental impacts.²⁶ The congressionally-authorized Western Water Policy Review Advisory Commission went further in its 1998 report,²⁷ recommending that the Corps and the Bureau undertake fairly detailed reviews of the operation of their projects, providing public involvement and considering operational changes that may go beyond current authorizations.²⁸

The Corps and the Bureau, however, rarely revise the operating plans for their dams. Although each agency has its own policies and practices in this regard, neither has a regular program of updating and revising the operating plans for all the dams it manages, and with certain exceptions neither has been eager to revisit the operating plan for a specific dam. Thus, the agencies continue to store and release water from their dams more or less as they have for decades, never officially considering—or providing an opportunity for others to propose—potential changes that could be beneficial. Because of this operational inertia, the Corps and the Bureau are missing an opportunity to adapt their water projects to changes that have already occurred and to prepare for future challenges, especially those posed by climate change.

This Article begins by reviewing the purposes for federal water projects, and identifies some of the trade-offs involved in operating

The major water problems of today were of little consequence when the Nation decided to assume responsibility for navigation improvements, reclamation, and flood control. Today, the United States is faced with a tremendous problem of pollution control. The great majority of its citizens live in cities, and the water problems of the urban areas cry out for attention. Recreation has become one of the most important uses of water resources. The people of the United States give far greater weight to environmental and esthetic values than they did when many of the water policies still in effect were enacted into law. In short, present conditions and needs differ greatly from those that existed when the Nation's most costly water programs were, for reasons good and sufficient at the time, brought into being.

Id. at 112.

26. COLLIER ET AL., *supra* note 1, at 4-7, 80-87.

27. Congress authorized the Western Water Policy Review Advisory Commission in 1992 as part of a large package of Bureau of Reclamation authorizations. W. WATER POLICY REVIEW ADVISORY COMM'N, *supra* note 23, at 1-1-1-4.

28. *Id.* at 6-25-6-26. The recommendation also extended to the Federal Energy Regulatory Commission, which issues licenses for non-federal hydropower projects. The report was somewhat ambiguous about whether such reviews should proceed in the absence of congressional direction to undertake them, and also about whether certain operational changes should be made without congressional approval.

projects for certain purposes. It then addresses the legal factors that determine or influence project operations, beginning with project authorizing statutes and ending with federal environmental laws. The Article examines Corps and Bureau policies regarding project operating plans, the reasons for agency reluctance to review and revise their plans, and some of the factors that prompt the agencies to proceed with reviews. It then summarizes periodic review requirements in two analogous contexts—federal land management plans, and hydropower project licenses—and considers the potential significance of these requirements for federal water projects. Finally, the Article examines what the Corps and the Bureau, along with the courts and Congress, are already doing on this issue, and what more they could do to ensure that project operating plans are reviewed and revised. It concludes with some brief observations about why the agencies should proceed with such reviews.

II. WATER PROJECT PURPOSES AND DAM OPERATIONS

Every federal dam was built to serve a specific purpose, or in most cases, two or more specific purposes. These purposes generally dictate how the dam is operated—the times or circumstances when it stores and releases water, and the rate at which the reservoir fills or the water is released. Operating a dam to serve one purpose, however, often has drawbacks for other purposes, or negative effects on other values upstream or downstream of the dam. In other words, dam operations inevitably involve trade-offs that may not have been fully recognized or appreciated at the time a particular dam was constructed. This Part examines the purposes for which federal water projects were built and some of the trade-offs presented by dam operating regimes.

A. Federal Water Project Purposes

The original federal dam-building program, chartered by the Reclamation Act of 1902,²⁹ authorized the Interior Department to design and construct projects for a single purpose: irrigation water supply.³⁰ The Reclamation Service (which later became the

29. Act of June 17, 1902, ch. 1093, 32 Stat. 388 (codified in scattered sections of 43 U.S.C. §§ 371–498).

30. *Id.* § 2 (authorizing the Interior Department to develop “irrigation works”).

Bureau) immediately recognized, however, that its water supply dams had great potential to generate power.³¹ Within thirty years, hydropower generation became nearly as important a part of the Bureau's mission as irrigation.³² Its water supply mission was also expanding, as Congress in 1920 opened the door to Reclamation projects delivering water "for other purposes than irrigation,"³³ and later specifically authorized the Bureau to supply water for municipal and industrial purposes.³⁴ Reservoir recreation became another notable product of the Reclamation program, and in some cases a selling point for new dams.³⁵ As it built more projects that did not simply benefit farmers, but provided water and power for a broader clientele, the Bureau became increasingly influential across the West.³⁶

The Corps became a prolific dam-builder following the Flood Control Act of 1936,³⁷ in which Congress made flood control a federal activity³⁸ and made the Corps responsible for "Federal investigations and improvements of rivers and other waterways for flood control and allied purposes."³⁹ Ironically, the Corps had long

31. Jay Brigham, *From Water to Water and Power: The Changing Charge of the Bureau of Reclamation*, in HISTORY ESSAYS VOL. 2, *supra* note 6, at 697, 699–701.

32. "While water certainly remains the [Bureau's] primary objective, electrical generation provides considerable revenue. Examining the first three decades of the Bureau's history, from its formation through the passage of the Boulder Dam Act, reveals how the Bureau's mission changed from water to water and power." *Id.* at 698.

33. Act of Feb. 25, 1920, ch. 86, 41 Stat. 451 (codified at 43 U.S.C. § 521). Congress placed important restrictions on the Bureau supplying water for such "miscellaneous purposes," however, including prohibiting such deliveries if they would "be detrimental to the water service of such irrigation project." *Id.*

34. Reclamation Project Act of 1939, Pub. L. No. 76-260, ch. 418, § 9(c), 53 Stat. 1187, 1194 (codified at 43 U.S.C. § 485h(c)).

35. Stephen C. Sturgeon, *Just Add Water: Reclamation Projects and Development Fantasies in the Upper Basin of the Colorado River*, in HISTORY ESSAYS VOL. 2, *supra* note 6, at 715, 723–25 (2008) (summarizing arguments in support of the proposed Colorado River Storage Project, regarding the recreational benefits that its many dams would provide).

36. "Not until the 1930s, when the 'High Dam Era' gave the bureau responsibilities for providing water and power to cities as well as farms, did it become the most important federal agency in the West. From 1930 to 1970 the water and power provided by the bureau transformed the region." Pisani, *supra* note 6, at 611.

37. Act of June 22, 1936, ch. 688, 49 Stat. 1570.

38. 33 U.S.C. § 701a (2012) (stating "the sense of Congress that flood control on navigable rivers or their tributaries is a proper activity of the Federal Government in cooperation with States" and local governments).

39. *Id.* § 701b. Congress provided, however, that the Corps' flood control work "shall not interfere with investigations and river improvements incident to reclamation projects" undertaken by the Bureau. *Id.*

opposed building dams for flood control, but eventually yielded to political pressure and took on this role.⁴⁰ After a similar about-face on the propriety of federal involvement in hydropower development, the Corps built dozens of dams that included hydropower facilities, becoming a major producer of hydropower.⁴¹ And just as it expanded the Reclamation program beyond irrigation, Congress authorized the Corps to build multi-purpose dams for “an expanding array of public purposes that included flood control, hydropower, flat water recreation, and even irrigation and municipal water supply.”⁴²

The array of purposes served by Bureau and Corps reservoirs is reflected in summary statistics on their total benefits, proudly reported by each agency. The Bureau says it operates 337 reservoirs that can store up to 245 million acre-feet, supplies irrigation water for 10 million acres of farmland and drinking water for 31 million people, generates an average of 40 billion kilowatt-hours of hydropower, and manages 289 recreation sites with a total of 90 million annual visitor days.⁴³ The Corps states that it owns and operates over 600 dams that can generate nearly a quarter of the nation’s hydropower and store nearly 330 million acre-feet,⁴⁴ that these dams helped prevent nearly half a trillion dollars in flood damages over the course of a recent decade,⁴⁵ and that the

40. U.S. ARMY CORPS OF ENG’RS, *THE HISTORY OF THE U.S. ARMY CORPS OF ENGINEERS* 48–51 (1998) (explaining the Corps’ longstanding opposition to flood control dams, but noting that political demands were growing for such dams following the 1927 floods, and that the Corps was “[m]ainly reacting to this political interest” in reversing its position on whether such dams were justified).

41. *Id.* at 53–54. “Public power at multipurpose projects took hold during the New Deal and proliferated after World War II,” and by the late 1980s the Corps had seventy-three projects with hydropower facilities. “The Corps’ turnabout and its expanding mission in hydroelectric power development were a significant part of the organization’s history in the first six decades of the 20th century.” *Id.* at 54.

42. Robert Haskell Abrams, *Water Federalism and the Army Corps of Engineers’ Role in Eastern States Water Allocation*, 31 U. ARK. LITTLE ROCK L. REV. 395, 396 (2009).

43. *About Us—Fact Sheet*, RECLAMATION, <https://www.usbr.gov/main/about/fact.html> [<https://perma.cc/A3PT-L48H>] (last updated Mar. 2, 2017).

44. *Mission Overview*, U.S. ARMY CORPS OF ENG’RS, <http://www.usace.army.mil/Missions.aspx> [<https://perma.cc/6HEQ-6MZJ>] (last visited Feb. 9, 2017).

45. “USACE dams contributed to \$485 billion in damages prevented from 2004 to 2013, with \$13.4 billion in damages prevented in 2013. USACE flood damage reduction projects avoid \$8.00 in damages for each \$1.00 invested.” *Dam Safety Facts and Figures*, U.S. ARMY CORPS OF ENG’RS, <http://www.usace.army.mil/Media/Fact-Sheets/Fact-Sheet-Article-View/Article/590578/dam-safety-facts-and-figures> [<https://perma.cc/5ZUA-EVU6>] (last visited Feb. 9, 2017).

Corps is “the Nation’s number one provider of outdoor recreation.”⁴⁶ In addition, each agency is somewhat involved in the other’s primary business, with the Bureau providing some flood control⁴⁷ and the Corps supplying some water for consumptive uses.⁴⁸ And despite the legendary environmental impacts of their dam construction work, both agencies (especially the Corps) tout their environmental efforts, especially restoration of fish and wildlife populations and habitat.⁴⁹ Today, both the Bureau and the Corps clearly want to be seen as multi-purpose water management agencies that provide a wide range of benefits to the nation.⁵⁰

Not every Bureau or Corps reservoir provides this full range of benefits, however. While many projects (especially larger and more recent ones) serve multiple purposes, others may be operated for only one or two purposes. For example, a particular Bureau reservoir may be limited to water supply and hydropower, while a particular Corps reservoir may operate only for flood control and recreation. The legal basis of these restrictions is explained

46. *Mission Overview*, *supra* note 44. The Corps claims over 400 lake and river projects in forty-three states, providing a third of all U.S. freshwater fishing. *Recreation Overview*, U.S. ARMY CORPS OF ENG’RS, <http://www.usace.army.mil/Missions/Civil-Works/Recreation> [<https://perma.cc/MM2C-UTB8>] (last visited Feb. 9, 2017).

47. “Flood control is one of the benefits provided on many Reclamation projects. Reclamation operates its facilities to prevent millions of dollars of flood damage. Between 1950 and 1992, Reclamation projects prevented in excess of \$8.3 billion in flood damage.” U.S. BUREAU OF RECLAMATION, *supra* note 6, at 10.

48. The Corps’ water supply mission involves more projects and more water than one might think. A recent report states that “133 Corps multi-purpose reservoirs in 26 states have 11.1 million acre-feet of storage space” for municipal and industrial water supply. CYNTHIA BROUGHER & NICOLE T. CARTER, CONG. RESEARCH SERV., R42805, REALLOCATION OF WATER STORAGE AT FEDERAL WATER PROJECTS FOR MUNICIPAL AND INDUSTRIAL WATER SUPPLY, at 3 (2012).

49. On the “Missions” page of the Corps website, “Environmental” appears just below “Civil Works” and “Military Missions.” In describing its environmental program, the Corps declares, “As the nation’s environmental engineer, the U.S. Army Corps of Engineers manages one of the largest federal environmental missions: restoring degraded ecosystems; constructing sustainable facilities; regulating waterways; managing natural resources; and, cleaning up contaminated sites from past military activities.” *Environmental Program*, U.S. ARMY CORPS OF ENG’RS, <http://www.usace.army.mil/Missions/Environmental.aspx> [<https://perma.cc/GY9V-858Q>] (last visited Feb. 17, 2017). The Bureau does not claim the same kind of environmental “program,” but its current one-sentence “mission statement” calls for actions that are “environmentally sound,” and its longer “vision statement” refers to preserving natural resources and ecosystems, protecting the environment, and protecting or enhancing conditions for fish and wildlife. *About Us—Mission/Vision*, *supra* note 8.

50. One of the Corps’ most important missions is supporting navigation, and this is a purpose of many Corps projects, including some reservoirs that release water to ensure a certain depth of water in a navigation channel below the dam.

below;⁵¹ the next Section draws on judicial decisions to identify some of the trade-offs involved in federal water project operations for certain purposes.

B. Impacts and Trade-Offs of Reservoir Operations: Examples from Litigation

One of the important early cases on dam operations, *Upper Snake River Chapter of Trout Unlimited v. Hodel*,⁵² shows a simple operational conflict involving one dam and two uses within a single state. The Bureau operated Palisades Dam on Idaho's South Fork Snake River for water supply, storing and releasing water for the benefit of downstream irrigators. The river below the dam supported a productive and popular trout fishery, and under normal circumstances the dam released no less than 1000 cubic feet per second ("cfs") to support this fishery. In the midst of a multi-year drought, however, the Bureau cut downstream releases to 750 cfs so as to store more of the available water supply; environmentalists and anglers objected that the reduced flows would adversely affect the South Fork Snake trout population, and asked for an environmental review.⁵³ Rejecting those arguments, the courts acknowledged that the lower flows would harm the downstream fishery,⁵⁴ but emphasized the Bureau's established practice of cutting releases during droughts to store more water for irrigation purposes.⁵⁵

The ongoing dispute over Lake Lanier, formed by the Corps' Buford Dam on the Chattahoochee River in Georgia, is somewhat more complex because it involves multiple interests in an interstate river basin, the Appalachian-Chattahoochee-Flint ("ACF"). Georgia has pushed the Corps to allocate Lake Lanier water to supply the needs of the growing Atlanta metropolitan area, and the Corps has done so for decades under a series of temporary arrangements.⁵⁶ Diverting more water for this purpose, however, would make less water available for hydropower generation, so

51. See *infra* Part III, especially Sections III.A and III.B.

52. *Upper Snake River Chapter of Trout Unlimited v. Hodel*, 921 F.2d 232 (9th Cir. 1990).

53. *Id.* at 233–34.

54. *Id.* at 234.

55. *Id.* at 234–35.

56. See *Se. Fed. Power Customers, Inc. v. Geren*, 514 F.3d 1316, 1318 (D.C. Cir. 2008).

hydropower users sued to challenge to the Corps' authority to allocate Lake Lanier water for water supply.⁵⁷ Certain Georgia water suppliers intervened, and eventually the parties reached a settlement whereby the Corps would increase the water temporarily allocated for the Georgia entities while providing financial compensation for the hydropower interests.⁵⁸ The downstream States of Alabama and Florida objected, however, because they feared that more water for Georgia would reduce flows in the Chattahoochee to their detriment;⁵⁹ Florida was specifically concerned about environmental impacts of lower flows on the Appalachicola Bay estuary.⁶⁰ The downstream states prevailed in their challenge to the settlement,⁶¹ but litigation has continued in other courts,⁶² and Lake Lanier remains at the heart of a lengthy and contentious battle over ACF water allocation.⁶³

The Bureau's Klamath Project, in the Klamath River Basin of Oregon and California, faces similar upstream/downstream pressures that have grown more intense and complicated over the past two decades. Upper Klamath Lake, which the Bureau manages as a reservoir by operating Link River Dam, provides the main source of storage for irrigators who receive water from the project. National wildlife refuges in the basin also rely on the project to provide water for some of the most important migratory bird habitat on the West Coast. Releasing water for these uses lowers the level of Upper Klamath Lake, reducing the available habitat for two species of suckers that are protected by the Endangered Species Act ("ESA"). Since 1997 the ESA has also protected coho salmon in the Klamath River downstream of the project, requiring substantial releases from Upper Klamath Lake to

57. *Id.* at 1319.

58. *Id.* at 1319–20.

59. *Id.* at 1320.

60. *Id.*; *see also* Georgia v. U.S. Army Corps of Eng'rs, 302 F.3d 1242, 1248–52 (11th Cir. 2002) (explaining potential impacts to Florida of increasing water supply allocation from Lake Lanier).

61. *Geren*, 514 F.3d at 1324–25.

62. *See In re MDL-1824 Tri-State Water Rights Litig.*, 644 F.3d 1160 (11th Cir. 2011) (determining that water supply for the Atlanta area was indeed an authorized purpose of Lake Lanier).

63. *See* Jeremy P. Jacobs, *Supreme Court Appoints Special Master for Long-Running Fla.-Ga. Dispute*, GREENWIRE (Nov. 20, 2014), <http://www.eenews.net/greenwire/2014/11/20/stories/1060009311> [<https://perma.cc/KA83-9XQF>] (summarizing the dispute over Lake Lanier and ACF water use, resulting in Florida suing Georgia in the U.S. Supreme Court).

maintain flows in the river. And the fish populations in both the river and the lake are important to Indian tribes; the Hoopa, Karuk, and Yurok tribes have reservations along the Klamath River and rely heavily on its salmon runs, and the Klamath Tribes of the upper basin have treaty-based water rights to provide habitat for the fish, animals, and plants they have used since “time immemorial.” Salmon advocates successfully sued the Bureau in the early 2000s for ESA violations,⁶⁴ but the Klamath Project was the focus of bitter litigation on several fronts both before and after that case.⁶⁵

Glen Canyon Dam on the Colorado River, forming Lake Powell, is another facility where the Bureau’s operations affect diverse competing interests. Lake Powell is a key storage reservoir in the vitally important Colorado River system, and it releases a more-or-less set quantity of water per year to satisfy the annual allocations of Arizona, California, and Nevada. The volume and timing of daily releases from Glen Canyon Dam historically were dictated primarily by hydroelectric generation; high releases during times of peak demand were good for power revenues, but major daily and hourly fluctuations in flows were hard on the Colorado River ecosystem, including Grand Canyon National Park. Rapid changes in water levels also impacted trout anglers on the river reach just below the dam, as well as commercial and private rafters downstream in the Grand Canyon. Glen Canyon Dam releases are also key factors in the survival and recovery of endangered native fish species in the Colorado River. Finally, the Bureau’s operations have implications for flatwater recreation on the popular Lake Powell, as well as for the interests of tribes with reservations along the river downstream.⁶⁶ While releases fluctuate less dramatically than they once did, environmental groups have sued the Bureau, so far unsuccessfully, to establish a steadier flow regime for the river

64. See Reed D. Benson, *Giving Suckers (and Salmon) an Even Break: Klamath Basin Water and the Endangered Species Act*, 15 TUL. ENVTL. L.J. 197 (2002) (providing background on water disputes involving the Klamath Project and analyzing the litigation against the Bureau in the early 2000s).

65. One of the important cases of the 1990s, brought by Klamath Basin irrigators, was *Klamath Water Users Ass’n v. Patterson*, 204 F.3d 1206 (9th Cir. 1999); a later one, brought by salmon advocates, was *Pacific Coast Federation of Fishermen’s Ass’ns v. Bureau of Reclamation*, 426 F.3d 1082 (9th Cir. 2005).

66. See COLLIER ET AL., *supra* note 1, at 63–79 (describing Glen Canyon Dam effects on downstream resources, and scientific studies regarding alternative operating regimes).

downstream of the dam,⁶⁷ the Bureau and others recently completed a multi-year review of Glen Canyon operations.⁶⁸

The Corps must balance a different but equally complex array of interests in operating its string of giant dams on the Missouri River in Montana, the Dakotas, and Nebraska. These six dams offer a large volume of flood control space, helping protect downstream cities and farmlands. They also store water that is released to support navigation on the lower river, down to its confluence with the Mississippi at St. Louis. The volume and timing of releases also affect the habitat of endangered species in and along the river below Gavins Point, the lowest of the six dams. Farther upstream, the Corps' reservoirs provide flatwater recreation, supporting popular fisheries for walleye and other game species. The system also produces hydropower in large quantities, especially during high-flow years. When the dry years of the early 2000s brought low flows, however, the Corps was caught in a litigation crossfire, as the upstream states sued to maintain the levels of specific reservoirs in order to protect their game fish populations; Nebraska sued to force releases for downstream navigation; and environmental groups sued for a flow regime that would protect endangered species habitat.⁶⁹ Eventually the Corps mostly prevailed, as the courts upheld its operating decisions.⁷⁰ But the Corps later faced withering criticism for its handling of high flows, as it was unable to prevent downstream flooding in the historically wet year of 2011.⁷¹

In short, dam operations inevitably involve trade-offs, producing certain kinds of benefits but imposing other kinds of costs, often on different groups. Conflicts can therefore be expected, as those bearing the costs of current operations seek revisions that will be less damaging to their interests. In many cases, however, the operating agency will insist that it is legally required to continue the status quo with at most minor changes. This claim requires a

67. See, e.g., *Grand Canyon Trust v. Bureau of Reclamation*, 691 F.3d 1008 (9th Cir. 2012).

68. See *infra* notes 263–273 and accompanying text.

69. See Sandra B. Zellmer, *A New Corps of Discovery for Missouri River Management*, 83 NEB. L. REV. 305, 324–33 (2004) (summarizing multiple cases against the Corps regarding its Missouri River project operations).

70. *In re Operation of Mo. River Sys. Litig.*, 421 F.3d 618 (8th Cir. 2005).

71. See Paul Quinlan, *Lawmakers from Deluged States Blast Army Corps, Demand Immediate Changes, Accountability*, E&E DAILY (Oct. 19, 2011), <http://www.eenews.net/eedaily/stories/1059955160/search?keyword=deluged+states> [https://perma.cc/2GJ7-TBSQ] (describing comments made in congressional oversight hearing).

look at the legal factors governing operation of a particular water project, and the next Part addresses some of the common relevant factors for federal water projects.

III. LEGAL FACTORS BEARING ON PROJECT OPERATIONS

For both the Corps and the Bureau, the first consideration in operating a particular dam is the authorizing statute (or statutes) for that water project. In other respects there are some differences between the two agencies regarding project operations, as some of the key factors for the Bureau are nonexistent or less important at many Corps projects, and vice versa. A factor that both agencies must consider is the application of the federal environmental laws, especially the ESA, to their activities.

A. Project Authorizing Statutes

Both Corps and Bureau projects are governed primarily by authorizing statutes, whereby Congress has provided for construction of one or more projects.⁷² Each project is authorized for one or more purposes: irrigation water supply, flood control, hydropower production, recreation, etc.⁷³ These authorized purposes are the dam's official reasons for being, and they determine its basic operating priorities; that is, a dam authorized for flood control, hydropower, and recreation is constructed and operated to serve those specific functions.

72. One of the leading legal scholars on the Corps, after summarizing the various ways that Congress might come to consider a proposed project, concluded: "In the end, each project is authorized by Congress with a specific set of purposes, usually as part of a larger annual bill that encompasses multiple Corps' and other agency public works requests." Abrams, *supra* note 42, at 407. As for the Bureau, while there are general statutes that apply broadly to the reclamation program, "each project operates within its own legal framework, including project authorizing statutes and water supply contracts. The authorizing statutes specify (among other things) the purposes for which the projects are constructed and operated." Reed D. Benson, *Environmental Review of Western Water Project Operations: Where NEPA Has Not Applied, Will It Now Protect Farmers From Fish?*, 29 UCLA J. ENVT'L. L. & POL'Y 269, 275 (2011).

73. See, e.g., Flood Control Act of 1950, Pub. L. No. 81-516, § 204, 64 Stat. 163, 177 (approving "[t]he plan for flood control, water conservation, and related purposes, in the Russian River Basin, California"); Act of July 3, 1952, ch. 565, § 1, 66 Stat. 325, 325 (authorizing the Interior Department to construct the Collbran Project in Colorado for purposes of "supplying water for the irrigation of approximately twenty-one thousand acres of land and for municipal, domestic, industrial, and stockwater uses and of producing and disposing of hydroelectric power and, as incidental to said purposes, for the further purpose of providing for the preservation and propagation of fish and wildlife").

In most authorizing statutes, Congress paints with a broad brush, stating project purposes and describing the facilities to be constructed in fairly general terms. Thus, the statutes themselves typically contain few details about the design or intended operation of the projects they authorize. The usual source of such specific information about an authorized project is a planning report, prepared by the Corps or Bureau and delivered to Congress, detailing the specifications of project features and the benefits the project could provide. Especially for Corps projects, Congress often refers specifically to these reports in statute, authorizing the agency to proceed with a project as provided in the agency's report on the proposed project.⁷⁴ The language of these reports may be crucial in determining whether the project is allowed, or required, to be operated in a certain way.⁷⁵

Congress may authorize a project for multiple purposes, but not give the same priority to all of those purposes when it comes to operating the project. One purpose may be specified as top priority for the project, and/or one or more purposes may be identified as "secondary" priorities or "incidental" benefits of the project.⁷⁶ When the statutes assign priorities in this way, operations

74. See, e.g., Flood Control Act of 1962, Pub. L. No. 87-874, tit. II, § 203, 76 Stat. 1173, 1193 (authorizing the project "for the Ririe Dam and Reservoir, Willow Creek, Idaho, . . . substantially in accordance with the recommendations of the Chief of Engineers in House Document Numbered 562, Eighty-seventh Congress"). Bureau authorizing statutes often do not refer specifically to the agency's planning report, and even when they do, the statutes typically specify certain project features and purposes. See, e.g., Act of Aug. 16, 1962, Pub. L. No. 87-590, § 1, 76 Stat. 389, 389-90 (authorizing the Fryingpan-Arkansas Project for several listed purposes, to be constructed and operated "in substantial accordance" with certain Bureau engineering reports, but with specified modifications from the project recommended in the original report).

75. See *In re MDL-1824 Tri-State Water Rights Litig.*, 644 F.3d 1160, 1186-92 (11th Cir. 2011) (addressing the Corps' authority to operate the Buford Dam and Lake Lanier for water supply purposes); *Jicarilla Apache Tribe v. United States*, 657 F.2d 1126, 1140-42 (10th Cir. 1981) (addressing the Bureau's authority to deliver water from the San Juan-Chama Project to a city for storage for recreational purposes).

76. For example, Congress authorized the Washita Basin Project in Oklahoma for the principal purposes of storing, regulating, and furnishing water for municipal, domestic, and industrial use, and, for the irrigation of approximately twenty-six thousand acres of land and of controlling floods and, as incidents to the foregoing for the additional purposes of regulating the flow of the Washita River, providing for the preservation and propagation of fish and wildlife, and of enhancing recreational opportunities.

Act of Feb. 25, 1956, ch. 71, § 1, 70 Stat. 28, 28-29.

will normally reflect those priorities in the event of a conflict among the authorized purposes of the project.⁷⁷

Once it authorizes a project, Congress can later adjust the authorized purposes in various ways. It may add a new authorized purpose to a specific project, such as adding “fish and wildlife” as a purpose to a project originally authorized only for, say, flood control or irrigation.⁷⁸ It may enact a general statute allowing certain uses or activities at all existing water projects for one or more agencies.⁷⁹ Or it can (but rarely does) revise a specific project’s authorization in a way that effectively changes a project’s operating priorities, which it did most famously in enacting the Central Valley Project Improvement Act, raising the priority of environmental protection and restoration at the expense of some agricultural irrigators.⁸⁰

B. Programmatic Statutes

While much of the law regarding federal water project operations is project-specific, some statutes are broader in scope, applying to most or all projects operated by a particular agency. These “programmatic” statutes establish general policies for the Bureau

77. See, e.g., *Raymond Proffitt Found. v. U.S. Army Corps of Eng’rs*, 343 F.3d 199, 210–12 (3d Cir. 2003) (upholding the Corps’ decision to retain flood control as the top priority for operating the Walter Dam, despite a subsequent statute requiring the Corps to make environmental protection a “primary” mission at Corps projects); *Jicarilla Apache Tribe*, 657 F.2d at 1138–40, 1145 (rejecting a city’s proposal to use water from the San Juan-Chama project for nonconsumptive uses, because such uses were authorized but secondary purposes of that project).

78. See, e.g., Act of Mar. 26, 1964, Pub. L. No. 88-293, 78 Stat. 171 (revising authorization of the Corps’ Cochiti Reservoir to allow for a permanent pool of up to 50,000 acre-feet for fish and wildlife and recreational purposes); Reclamation Authorization Act of 1975, Pub. L. No. 94-228, tit. III, 90 Stat. 205, 207 (1976) (reauthorizing the McKay Dam and Reservoir, part of the Umatilla Project in Oregon, “for the purposes of irrigation, flood control, fish and wildlife, recreation, and safety of dams,” and adjusting financial arrangements for the project to reflect new purposes).

79. See, e.g., Sale of Water for Miscellaneous Purposes Act of 1920, ch. 86, 41 Stat. 451 (codified at 43 U.S.C. § 521) (allowing the Bureau to sell water from irrigation projects for other purposes, under certain conditions); Federal Water Project Recreation Act, Pub. L. No. 89-72, 79 Stat. 213 (1965) (codified as amended at 16 U.S.C. §§ 4601-12–4601-21) (setting policy regarding recreational facilities in connection with existing and new federal reservoirs).

80. Central Valley Project Improvement Act, Pub. L. No. 102-575, tit. XXXIV, 106 Stat. 4600, 4706–4731. Perhaps most notably, Congress in section 3406(b)(2) of this act directed the Bureau to immediately repurpose 800,000 acre-feet of project water for the benefit of fish and wildlife restoration.

or the Corps, and these policies may affect operations at all projects that have not been exempted from them by Congress.

For purposes of this Article, one of the more important general statutes is section 301 of the Water Supply Act of 1958,⁸¹ which is an unusual programmatic statute in that it applies to *both* the Bureau and the Corps. Section 301 provides that “[m]odifications of a reservoir project heretofore authorized, surveyed, planned, or constructed to include storage” must be approved by Congress if the proposed modifications “would seriously affect the purposes for which the project was authorized, surveyed, planned, or constructed, or which would involve major structural or operational changes.”⁸² This statute limits the agencies’ ability to unilaterally repurpose or reoperate their projects, while implicitly allowing changes that are not “major” and do not “seriously” interfere with existing project purposes; these terms thus confer some limited discretion on the agencies to revise project operations.⁸³

The 1944 Flood Control Act⁸⁴ established key elements of the legal framework governing Corps project operations generally, providing authorities and requirements for a range of project purposes. Section 7 imposes a mandatory duty on the Corps

to prescribe regulations for the use of storage allocated for flood control or navigation at all reservoirs constructed wholly or in part with Federal funds provided on the basis of such purposes, and the operation of any such project shall be in accordance with such regulations.⁸⁵

Because this provision extends to all reservoirs built with federal funds allocated for flood control or navigation purposes, it gives

81. Water Supply Act of 1958, Pub. L. No. 85-500, § 301, 72 Stat. 297, 319 (codified at 43 U.S.C. § 390b).

82. *Id.* § 301(d) (codified at 43 U.S.C. § 390b(d)).

83. The agencies’ discretion is limited because their decisions may be subject to judicial review, and the courts may find a “major” change or “serious” effect even where the agency did not. *See* *Se. Fed. Power Customers v. Geren*, 514 F.3d 1316 (D.C. Cir. 2008) (holding that the Corps’ proposed allocation of Lake Lanier storage for water supply in Georgia was clearly a major operational change).

84. Flood Control Act of 1944, Pub. Law No. 78-534, 58 Stat. 887.

85. *Id.* § 7, 58 Stat. at 890–91 (codified at 33 U.S.C. § 709).

the Corps regulatory power over these authorized functions at projects built by other agencies.⁸⁶

Other provisions of the 1944 Act deal with water supply, hydropower, and recreation at Corps projects. The most notable provision on water supply⁸⁷ is section 6,⁸⁸ which authorizes the Corps to make contracts to supply “surplus” water from its projects for domestic and industrial water supply, provided that the contract does not harm “existing lawful uses of such water.”⁸⁹ Section 5⁹⁰ provides for marketing of hydropower generated at Corps projects “in such manner as to encourage the most widespread use thereof at the lowest possible rates to consumers consistent with sound business principles.”⁹¹ Section 4⁹² authorizes the Corps to provide for “public park and recreational facilities” at its projects,⁹³ and provides for public access and use of reservoir waters “for boating, swimming, bathing, fishing, and other recreational purposes.”⁹⁴ While these provisions do not specifically address reservoir operations for these purposes, they set general policy regarding a range of important uses on the Corps’ national assortment of reservoir projects.

86. By its own terms, however, section 7 of the 1944 Act does not apply to Tennessee Valley Authority project operations. *Id.* Section 2 of the 1944 Act gave the Corps jurisdiction over the federal government’s in-river flood control activities. *Id.* § 2, 58 Stat. at 889 (codified at 33 U.S.C. § 701a-1).

87. Another provision relating to water supply is section 8, authorizing the Interior Department to develop irrigation water supplies at Corps projects, but only after the Corps has determined that one of its projects “may be utilized for irrigation purposes.” *Id.* § 8, 58 Stat. at 891 (codified at 43 U.S.C. § 390).

88. *Id.* § 6, 58 Stat. at 890 (codified at 33 U.S.C. § 708).

89. These contracts may be with “States, municipalities, private concerns, or individuals, at such prices and on such terms as [the Secretary of Defense] may deem reasonable.” *Id.*

90. *Id.* § 5, 58 Stat. at 890 (codified at 16 U.S.C. § 825s).

91. The 1944 Act directed that the hydropower “shall be delivered to the Secretary of the Interior, who shall transmit and dispose of such power” at rates determined by the Federal Power Commission. *Id.* Since then, Congress amended this provision, transferring the marketing duties to the Secretary of Energy and eliminating the Commission’s role in setting rates for this power. *See* 16 U.S.C. § 825s (2012).

92. Flood Control Act of 1944 § 4, 58 Stat. at 889 (codified at 16 U.S.C. § 460d).

93. The Corps may provide these facilities either by building them itself, or leasing lands to public or private entities to develop them. *Id.*

94. Public recreation is to be allowed “when such use is determined by the Secretary of the Army not to be contrary to the public interest, all under such rules and regulations as the Secretary of the Army may deem necessary.” *Id.*

Programmatic statutes governing the Bureau date back over a century, starting with the 1902 Reclamation Act,⁹⁵ in which Congress provided that the Bureau should remain responsible for management and operation of its reservoirs even after the irrigator beneficiaries of a particular project have finished repaying their share of the cost of building that project.⁹⁶ Before long, however, Congress gave the Bureau broad discretionary power to transfer operation and maintenance of “all or any part of the project works” to a water users’ association or irrigation district that requested such a transfer.⁹⁷ Under this authority, the Bureau has transferred operational control of roughly two-thirds of its facilities to project beneficiaries, thus retaining such control over about one-third of project facilities.⁹⁸

Other programmatic statutes affect Bureau operations indirectly, by authorizing or restricting certain uses of project water or facilities. Some provisions authorize the Bureau generally to provide for non-irrigation uses of a project, such as hydropower or municipal water supply, but only if the additional use would not impair the project’s ability to provide water for irrigation.⁹⁹ Such statutes give the Bureau a measure of discretion to expand the purposes a project may serve, and while the “no harm to irrigation” provisions limit that discretion, they provide no enforceable

95. Act of June 17, 1902, ch. 1093, 32 Stat. 388 (codified in scattered sections of 43 U.S.C. §§ 371–498).

96. Section 6 of the 1902 Act provided that when the irrigator beneficiaries of a Bureau project have paid their share of project costs, “then the management and operation of such irrigation works shall pass to the owners of the lands irrigated thereby,” but that “the title to and the management and operation of the reservoirs and the works necessary for their protection and operation shall remain in the Government until otherwise provided by Congress.” *Id.* § 6 (codified at 43 U.S.C. § 498).

97. Reclamation Extension Act of 1914, ch. 247, § 5, 38 Stat. 686, 687 (codified at 43 U.S.C. § 499). Congress enacted this provision without changing 43 U.S.C. § 498 or its requirement that the Bureau retain operations and management responsibilities for project reservoirs. *See supra* note 96.

98. NIC LANE, CONG. RESEARCH SERV., RL34466, THE BUREAU OF RECLAMATION’S AGING INFRASTRUCTURE, at 2 (2008). Facilities for which the Bureau has transferred operations and maintenance responsibilities are called “transferred works,” and those for which it has retained such responsibilities are called “reserved works.”

99. *See, e.g.*, 43 U.S.C. § 522 (2012) (allowing the lease of surplus hydropower or power privileges from a project, provided that no such lease may “impair the efficiency of the irrigation project”); *id.* § 521 (allowing the sale of surplus water from a project subject to several requirements, including no detriment to irrigation water supplies).

guarantee that a particular project will be operated in the way its irrigator beneficiaries would want.¹⁰⁰

Perhaps the Bureau's best-known statutory requirement comes from section 8 of the original 1902 Reclamation Act, mandating that "the Secretary of the Interior, in carrying out the provisions of this act, shall proceed in conformity with" state laws "relating to the control, appropriation, use, or distribution of water used in irrigation, or any vested right acquired thereunder."¹⁰¹ The U.S. Supreme Court initially read this statute narrowly, stating that section 8 did not require the Bureau to deliver water on terms established by a state.¹⁰² But the Court re-interpreted section 8 in *California v. United States*,¹⁰³ holding that it allows a state to impose conditions on a Bureau project so long as the conditions are "not inconsistent" with relevant congressional directives.¹⁰⁴ The combination of section 8 and state laws has the potential to affect Bureau project operations significantly; most remarkably, one court held that the Bureau violated section 8 and California law by operating massive Friant Dam—a vital irrigation reservoir—in a way that dried up the San Joaquin River and devastated its salmon populations.¹⁰⁵

C. Other Factors Affecting Project Operations

Statutes generally dictate the operating priorities of a federal water project, but they typically impose few if any specific operating requirements or restrictions, leaving the agency to determine the operational details consistent with the authorized project purposes. Agencies must consider additional factors, however, in making decisions regarding the timing and rate of storage and releases at a particular project. These factors vary depending on the nature and

100. *See, e.g.*, *San Luis Unit Food Producers v. United States*, 709 F.3d 798 (9th Cir. 2013) (rejecting arguments that the Bureau was required to deliver a certain amount of Central Valley Project water to plaintiffs for irrigation).

101. 43 U.S.C. § 383.

102. *Ivanhoe Irrigation Dist. v. McCracken*, 357 U.S. 275, 292 (1958); *Arizona v. California*, 373 U.S. 546, 586 (1963).

103. *California v. United States*, 438 U.S. 645 (1978).

104. *Id.* at 674.

105. *Nat. Res. Def. Council v. Patterson*, 333 F. Supp. 2d 906 (E.D. Cal. 2004). The court decided that California Fish & Game Code § 5937, requiring dams to release sufficient water to maintain downstream fish life, was a state water law within the scope of section 8, and that this requirement of state law did not conflict with congressional directives applicable to Friant Dam.

functions of the project, and while they are too numerous and complex to be explained here, this Section identifies a few of the more common ones.

The Corps develops “water control manuals” that govern the operation of its projects, as explained below.¹⁰⁶ At the heart of a water control manual is a reservoir regulation schedule that establishes operating criteria, including “rule curves” that specify reservoir levels to be maintained at certain times of year. The manual, then, is the Corps’ own set of detailed instructions for operating a project or system of projects. A water control manual may be binding on the Corps and enforceable in the courts, as held in the multi-state litigation over the Corps’ operation of its Missouri River System projects.¹⁰⁷

For most Bureau projects, water supply contracts are a key factor in reservoir operations. These contracts are usually between the Bureau and a water supply entity such as an irrigation district or a municipal water supplier. The contracts take various forms and address numerous issues, but in nearly all contracts the basic exchange is that the water supplier pays a certain amount of money to the Bureau each year, and the Bureau delivers water (up to a defined annual limit) to the supplier for distribution to its users.¹⁰⁸ In the usual course of operations, the Bureau stores water in a reservoir to ensure that supplies are sufficient to satisfy existing contracts, and releases that water when an entity with a contractual right to it calls for the Bureau to deliver it.¹⁰⁹

106. See *infra* notes 162–183 and accompanying text.

107. *South Dakota v. Ubbelohde*, 330 F.3d 1014 (2003).

108. Drought conditions and Endangered Species Act requirements—especially in combination—have led the Bureau to reduce contract deliveries in certain years, resulting in several court cases since the early 1990s. These cases have addressed whether the Bureau is bound to deliver water under the contracts rather than making it available for protected species, and whether the Bureau must pay compensation if it fails to do so. See A. DAN TARLOCK ET AL., *WATER RESOURCE MANAGEMENT* 505–24 (7th ed. 2014) (reviewing and analyzing relevant cases).

109. In seeking to limit its ESA duties to provide water for the Rio Grande silvery minnow, the Bureau basically argued that it had no choice but to release water from its reservoirs in response to delivery calls from entities with contracts to receive the stored water. See Joan E. Drake, *Contractual Discretion and the Endangered Species Act: Can the Bureau of Reclamation Reallocate Federal Project Water for Endangered Species in the Middle Rio Grande?*, 41 *NAT. RESOURCES J.* 487, 497–98 (2001).

State water law may also impose operating restrictions on federal water projects,¹¹⁰ particularly water supply projects located in the western states where water is allocated and managed under the prior appropriation doctrine.¹¹¹ For example, the water rights for a project may prohibit water from being stored at certain times of year, or specify a minimum pool level or release rate to protect fish above and below the dam, respectively. States that follow the “one fill rule” limit the amount any reservoir may store in one year to the volume of the reservoir, thus restricting refill and limiting operational flexibility.¹¹² The “first in time, first in right” aspect of western water law¹¹³ may curtail storage in a federal reservoir at times when all the available water in the system is needed to satisfy older water rights of higher priority.¹¹⁴

Hydropower is another major factor in the operation of many projects, as the two agencies combine for nearly 130 hydropower plants and forty percent of the nation’s hydropower generation.¹¹⁵ The imperatives for hydropower at Corps and Bureau projects are even more varied and complex than those for water supply, both in

110. As noted above, section 8 of the 1902 Reclamation Act has always required the Bureau carry out its activities in accordance with state water law, except where it conflicts with congressional directives regarding a project. *See supra* notes 101–105 and accompanying text.

111. *See generally* Casey S. Funk, *Basic Storage 101*, 9 U. DENV. WATER L. REV. 519 (discussing Colorado law regarding creation and exercise of water rights for storage projects).

112. *Id.* at 528–29 (explaining Colorado law on the subject).

113. This principle, fundamental to water law in the West, means that water rights established earliest in time take priority over later-established rights if there is not enough water to satisfy all rights at a particular time. This means that “junior” uses will be cut off or restricted as needed to ensure that “senior” users get their full supply. *See State ex rel. Cary v. Cochran*, 292 N.W. 239 (Neb. 1940) (explaining and interpreting this principle).

114. Interstate water allocation compacts impose somewhat similar operating requirements and restrictions on some federal reservoirs. For example, the Bureau’s Glen Canyon Dam on the Colorado must release water to satisfy “Law of the River” requirements rooted in the Colorado River Compact, and the Rio Grande Compact prohibits storage in certain reservoirs during times of shortage in order to ensure that Texas receives its share of water.

115. The Corps claims seventy-five hydropower plants that produce over seventy billion kilowatt-hours of electricity per year, or twenty-four percent of U.S. hydropower. U.S. Army Corps of Engineers, *Hydropower*, VALUE TO THE NATION, <http://www.corpsresults.us/hydropower/hydropower.cfm> [<https://perma.cc/VYW6-6MYB>] (last visited Feb. 11, 2017). The Bureau claims fifty-three plants, forty billion kilowatt-hours per year, and fifteen percent of U.S. hydropower. *About Us—Fact Sheet*, *supra* note 43.

terms of the contractual arrangements¹¹⁶ and the generating practices,¹¹⁷ making it nearly impossible to generalize meaningfully about the influence of hydropower on these agencies' operations.¹¹⁸ For certain projects, however, the greatest controversy has focused on whether operational changes to benefit fish, wildlife, or recreation are worth the cost in foregone hydropower generation and revenues.¹¹⁹

There are numerous other factors that may influence the Corps or the Bureau in operating their projects. For example, the agency might limit releases to keep reservoir levels high until a certain date, so as to sustain populations of a key sport fish¹²⁰ or support summer recreation at a popular reservoir.¹²¹ It might draw down a reservoir by making releases to ensure minimum river levels for navigation,¹²² to maintain water quality,¹²³ or to protect downstream

116. The official web page describing the Bureau's role in hydropower, in addressing the contractual arrangements for marketing power from Bureau projects, identifies four different kinds of contracts in five separate categories, and further identifies at least five factors used in determining the amount of power to be placed under contract. *Reclamation's Role in Hydropower*, RECLAMATION, http://www.usbr.gov/power/data/role_rpt.html [<https://perma.cc/D4C6-D29Z>] (last updated Feb. 4, 2016).

117. The official web page promoting the Corps' hydropower activities notes that some Corps facilities generate "peaking" power, releasing water at times of high demand; others are run-of-the-river facilities that produce power without significantly altering flows. Where the Corps has multiple projects in a river system, it coordinates their operations for hydropower and other purposes. U.S. ARMY CORPS OF ENG'RS, HYDROPOWER: VALUE TO THE NATION, at 4–6 (2009), http://www.corpsresults.us/docs/hydropower/VTNHypowerBro_lores.pdf [<https://perma.cc/84JB-MHHX>].

118. One general point is that hydropower from federal dams is marketed not by the Corps or the Bureau, but by a Power Marketing Administration ("PMA") within the Department of Energy. The four regional PMAs—Bonneville, Southeastern, Southwestern, and Western Area—are thus major players in the overall scheme of federal project hydropower. *Id.*

119. For example, the conflict between salmon and hydropower has been the crux of litigation over the Federal Columbia River Power System for over twenty years, focusing heavily on operation of the Corps' large dams on the Columbia and Snake Rivers. *See, e.g.,* Michael C. Blumm & Hallison T. Putnam, *Imposing Judicial Restraints on the "Art of Deception": The Courts Cast a Skeptical Eye on Columbia Basin Salmon Restoration Efforts*, 38 ENVTL. L. 47 (2008); *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 839 F. Supp. 2d 1117 (D. Or. 2011) (finding the 2008/2010 biological opinion for the Federal Columbia River Power System arbitrary and capricious).

120. Litigation in the early to mid-2000s over Corps operations on the Missouri were started when South Dakota sued to prevent the Corps from drawing down Lake Oahe at a time when South Dakota was concerned about impacts to the lake's walleye fishery. *South Dakota v. Ubbelohde*, 330 F.3d 1014, 1021 (8th Cir. 2003).

121. U.S. ARMY CORPS OF ENG'RS, *supra* note 117, at 4–6.

122. For its part in multi-state litigation against the Corps on the Missouri, Nebraska sought—successfully—to force the Corps to make reservoir releases to support navigation in

fish populations.¹²⁴ These latter two considerations address environmental concerns, but are not necessarily driven by requirements of environmental law, as briefly discussed in the next Section.

D. Federal Environmental Laws Applicable to Project Operations

Large dams create significant problems for aquatic and riparian ecosystems,¹²⁵ and growing concern about these impacts—along with the enactment of major environmental laws—helped end the era of major dam construction by the federal government. When it comes to dam operations, however, the environmental laws have had limited success in reducing or mitigating the effects of existing dams. Application of the environmental laws to federal water projects has been a source of litigation and political controversy since the late 1970s, when the Supreme Court ruled that the federal Tellico Dam could not be completed because the newly discovered snail darter was protected by the recently enacted ESA.¹²⁶

The ESA, which protects wildlife and plant species that have been listed as threatened or endangered under that law,¹²⁷ has been by far the most effective environmental statute in bringing changes to federal water project operations. The key ESA provision in this context is section 7,¹²⁸ which imposes special obligations, both

the river below the lowest of the Corps dams. *South Dakota v. Ubbelohde*, 330 F.3d 1014, 1028 (8th Cir. 2003).

123. See *Cent. Delta Water Agency v. Bureau of Reclamation*, 306 F.3d 938 (9th Cir. 2002) (addressing the release of water from the Bureau's New Melones Reservoir to ensure that downstream water quality standards are met).

124. See *San Luis & Delta-Mendota Water Auth. v. Jewell*, 52 F. Supp. 3d 1020 (E.D. Cal. 2014) (challenging the Bureau's release of reservoir water for purposes of averting potential die-off of downstream salmon populations).

125. See generally COLLIER ET AL., *supra* note 1, at 3, 7 (summarizing downstream impacts). Most of the circular explains various impacts in much greater detail, through a series of case studies drawn from rivers across the United States.

126. The Supreme Court's landmark decision in *Tennessee Valley Authority v. Hill*, 437 U.S. 153 (1978), helped make the ESA one of the most potent environmental laws. Congress later directed that the dam be completed, but largely preserved the law itself. See Holly Doremus, *The Story of TVA v. Hill: A Narrow Escape for a Broad New Law*, in ENVIRONMENTAL LAW STORIES 109, 132 (Richard J. Lazarus & Oliver A. Houck eds., 2005).

127. Section 4 of the ESA establishes detailed standards, procedures, and deadlines for the federal government's decisions on whether to list a particular species as threatened or endangered under the Act. 16 U.S.C. § 1533 (2012).

128. *Id.* § 1536.

substantive and procedural, on federal agencies. Section 7(a)(2) commands that every federal agency “shall . . . insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence” of any threatened species, or adversely modify its designated critical habitat.¹²⁹ Section 7(a)(2) couples this substantive standard of “no jeopardy” with a mandatory process known as “consultation.”¹³⁰ The Ninth Circuit has explained the consultation triggers and process as follows:

In order to ensure compliance with the Act, the ESA and its implementing regulations require federal agencies (“action agencies”) to consult with the appropriate federal fish and wildlife agency . . . whenever their actions “may affect” an endangered or threatened species. *See* 50 C.F.R. § 402.14(a). Thus, if the agency determines that a particular action will have no effect on an endangered or threatened species, the consultation requirements are not triggered.

If the action agency subsequently determines that its action is “likely to adversely affect” a protected species, it must engage in formal consultation. *Id.* Formal consultation requires that the consulting agency . . . issue a biological opinion determining whether the action is likely to jeopardize the listed species and describing, if necessary, reasonable and prudent alternatives that will avoid a likelihood of jeopardy. *See* 16 U.S.C. § 1535(b)(3)(A).¹³¹

An Interior Department rule¹³² exempts non-discretionary federal actions from these requirements;¹³³ thus, the Bureau¹³⁴ and the Corps¹³⁵ have sometimes argued that they have little or no discretion in operating a particular project, in hopes of limiting the ESA’s impact on that project.

129. *Id.* § 1536(a)(2).

130. *Id.*

131. *Pac. Rivers Council v. Thomas*, 30 F.3d 1050, 1054 n.8 (9th Cir. 1994).

132. 50 C.F.R. § 402.03 (2016).

133. A divided Supreme Court upheld this rule in *National Ass’n of Home Builders v. Defenders of Wildlife*, 551 U.S. 644 (2007).

134. *See, e.g., Defs. of Wildlife v. Norton*, 257 F. Supp. 2d 53 (D.D.C. 2003) (accepting the Bureau’s argument that it lacked discretion to operate its projects on the Lower Colorado River for the benefit of species living in Mexico).

135. *See, e.g., Nat’l Wildlife Fed’n v. Nat’l Marine Fisheries Serv.*, 524 F.3d 917 (9th Cir. 2008) (rejecting the Corps’ argument that the operation of federal multipurpose dams in the Columbia River system is largely nondiscretionary).

Where the agencies have consulted on project operations, the resulting biological opinions have sometimes found that existing operations would cause jeopardy to one or more listed species, and have essentially forced changes so as to avoid jeopardy.¹³⁶ Each of these consultations has its own complicated story, but a few points are worth making generally about section 7 of the ESA as applied to federal water projects. First, although a “jeopardy” biological opinion must include a “reasonable and prudent alternative” (“RPA”) that avoids jeopardy,¹³⁷ the RPA need not be the best course of action for the species, and may involve only modest changes to the operating agency’s proposal.¹³⁸ Second, many biological opinions on water project operations have been challenged in court, often (though not always) by environmental plaintiffs alleging that the government is doing too little to protect listed species.¹³⁹ Third, in several western river basins, conflict and litigation over the ESA has given way to collaborative efforts that

136. See Reed D. Benson, *Avoiding Jeopardy, Without the Questions: Recovery Implementation Programs for Endangered Species in Western River Basins*, 2 MICH. J. ENVTL. & ADMIN. L. 473, 491–500 (summarizing results of consultations on operations of three Bureau projects).

137. A jeopardy opinion must include a RPA unless none can be developed, in which case it should include a statement indicating that there is no known RPA. 50 C.F.R. § 402.14(h)(3).

138. The Ninth Circuit reinforced these points in upholding the biological opinion on operation of the Bureau’s Lake Mead on the Colorado River. The final RPA allowed the Bureau to destroy habitat that the Fish & Wildlife Service had originally thought was needed to prevent jeopardy to the southwestern willow flycatcher; the court essentially stated that the government had only to show that its chosen RPA would avoid jeopardy, and did not need to explain why it rejected options that would have better protected the species. *Sw. Ctr. for Biological Diversity v. Bureau of Reclamation*, 143 F.3d 515, 523 (9th Cir. 1998). The Eighth Circuit relied directly on this precedent in upholding a weakened biological opinion on the operation of the Corps’ dams on the Missouri River. *In re Operation of Mo. River Sys. Litig.*, 421 F.3d 618, 634–36 (8th Cir. 2005).

139. The Corps’ dam operations in the Columbia River Basin have been the focus of ESA litigation—mostly brought by environmental and fishing groups—for over two decades. See Michael C. Blumm & Aurora Paulsen, *The Role of the Judge in ESA Implementation: District Judge James Redden and the Columbia Basin Salmon Saga*, 32 STAN. ENVTL. L.J. 87 (2013). The Corps’ ESA compliance in operating its dams on the Missouri River was also challenged by environmental groups. *In re Operation of Mo. River*, 421 F.3d at 625–28. Environmental plaintiffs also challenged biological opinions regarding Bureau project operations in the Lower Colorado, Klamath, and Middle Rio Grande basins. See Benson, *supra* note 136, at 491–500. Irrigators have brought some cases, however, including many challenges to the Bureau’s ESA compliance in operating the Central Valley Project of California. See, e.g., *San Luis & Delta-Mendota Water Auth. v. Jewell*, 747 F.3d 581 (9th Cir. 2014).

seek to improve conditions for listed species while providing for ongoing water project operations.¹⁴⁰

While the ESA has forced the Bureau and the Corps to consider how their operations affect listed species and their habitat, no other law has been widely effective in making environmental considerations a major factor in these agencies' operating decisions. The Clean Water Act¹⁴¹ declares that its primary objective is "to restore and maintain the chemical, physical, and biological integrity of the nation's waters,"¹⁴² indicating that Congress was concerned about more than just preventing contamination.¹⁴³ Moreover, the statute identifies "changes in the movement, flow, or circulation of any navigable waters or ground waters, including changes caused by the construction of dams," as a form of water pollution.¹⁴⁴

Despite its lofty goals, the Clean Water Act has never reached its potential in the context of water project operations, but instead has been limited by Environmental Protection Agency ("EPA") policies and judicial decisions accepting those policies. Most significantly, the Clean Water Act's most effective regulatory requirement—pollutant discharge permits under section 402¹⁴⁵—does not apply to a dam's release of water, even if it contains pollutants that would impair the "integrity" of the receiving water.¹⁴⁶ EPA has also

140. Benson, *supra* note 136, at 501–04 (describing such efforts in the Lower Colorado, Klamath, Middle Rio Grande, and Missouri basins).

141. 33 U.S.C. §§ 1251–1387 (2012).

142. *Id.* § 1251(a).

143. See Robert W. Adler, *The Two Lost Books in the Water Quality Trilogy: The Elusive Objectives of Physical and Biological Integrity*, 33 ENVTL. L. 29, 32–47 (2003) (analyzing congressional intent in enacting the 1972 Clean Water Act and concluding that Congress understood the importance of protecting ecosystem integrity).

144. 33 U.S.C. § 1314(f)(2)(F) (directing the EPA Administrator to provide information on identifying and controlling nonpoint source pollution of various types, including water changes caused by dams or other listed structures). The Supreme Court mentioned this provision in rejecting an argument that the Clean Water Act allows only regulation of water quality, not water quantity, calling that an "artificial distinction." PUD No. 1 of Jefferson Cty. v. Wash. Dep't of Ecology, 511 U.S. 700, 719–20 (1994).

145. These permits are also known as NPDES permits, issued under the "National Pollutant Discharge Elimination System" provided by section 402 of the Clean Water Act. 33 U.S.C. § 1342.

146. Courts upheld EPA's position that no permit was needed for dam releases, despite the presence of pollutants in the water being released, on the rationale that the releases were simply moving pollutants that were already present in the water, not adding them to water. Nat'l Wildlife Fed'n v. Gorsuch, 693 F.2d 156 (D.C. Cir. 1982); Nat'l Wildlife Fed'n v. Consumers Power Co., 862 F.2d 580 (6th Cir. 1988).

adopted a rule exempting “water transfer” projects (which move water from one location to another without adding a pollutant in the process) from section 402 permitting,¹⁴⁷ foregoing potential water quality benefits but avoiding any possible conflict with water supply goals.¹⁴⁸ In short, regardless of their impacts on water quality, federal water projects have continued to operate outside the section 402 permitting program that applies to other “point source” discharges of pollutants.¹⁴⁹

Another environmental law that has done surprisingly little to promote revised project operations is the National Environmental Policy Act (“NEPA”),¹⁵⁰ which President Obama called “the cornerstone of our Nation’s modern environmental protections.”¹⁵¹ Although courts have held that NEPA places no enforceable substantive duties on federal agencies,¹⁵² it does require them to produce a “detailed statement” of environmental impacts and potential alternatives before taking any “major federal action[] significantly affecting the quality of the human environment;”¹⁵³ the Environmental Impact Statement (“EIS”) has become a familiar

147. “Water transfer means an activity that conveys or connects waters of the United States without subjecting the transferred water to intervening industrial, municipal, or commercial use. This exclusion does not apply to pollutants introduced by the water transfer activity itself to the water being transferred.” 40 C.F.R. § 122.3(i) (2016). The Second Circuit recently upheld the rule as a reasonable interpretation of an ambiguous statute. *Catskill Mountains Chapter of Trout Unlimited, Inc. v. EPA*, 846 F.3d 492 (2d Cir. 2017).

148. For a fairly thorough discussion of the competing legal and policy arguments advanced by supporters and opponents of section 402 permitting for water transfer projects, see *Catskill Mountains Chapter of Trout Unlimited, Inc. v. City of New York*, 451 F.3d 77 (2d Cir. 2006) (finding a permit needed for a water supply tunnel, refusing to follow EPA guidance on the issue); *Friends of the Everglades v. S. Fla. Water Mgmt. Dist.*, 570 F.3d 1210 (11th Cir. 2009) (finding a permit not needed for drainage pumps, deferring to the EPA rule on the issue).

149. A recent Ninth Circuit case held that no section 402 permit was needed for the Klamath Straits Drain, part of the Bureau’s Klamath Project, even if it did add polluted water to the Klamath River, because the two waters were not “meaningfully distinct.” *ONRC Action v. Bureau of Reclamation*, 798 F.3d 933 (9th Cir. 2015).

150. 42 U.S.C. §§ 4321–4370f (2012).

151. Proclamation No. 8469, 75 Fed. Reg. 885 (Jan. 7, 2010).

152. See, e.g., *Strycker’s Bay Neighborhood Council, Inc. v. Karlen*, 444 U.S. 223 (1980); *Calvert Cliffs Coordinating Comm., Inc. v. Atomic Energy Comm’n*, 449 F.2d 1109 (D.C. Cir. 1971).

153. 42 U.S.C. § 4332(2)(C). Section 102(2) of NEPA applies to all agencies of the federal government, and states several requirements in addition to the “detailed statement” mandate of subsection (C), one of which is to “study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.” *Id.* § 4332(2)(E).

requirement for many types of federal agency action. By requiring environmental reviews, NEPA ensures that federal agencies develop and consider information on the environmental impacts of their proposed actions, and also provide opportunities for public participation in their decision-making.¹⁵⁴

Despite the environmental significance of their operating decisions, however, the Bureau and the Corps do not regularly conduct environmental reviews on ongoing project operations. The courts have largely exempted the agencies from complying with NEPA in the context of “routine” project operations. The leading case, *Upper Snake River Chapter of Trout Unlimited v. Hodel*,¹⁵⁵ upheld the Bureau’s decision not to conduct an environmental review before cutting releases from Palisades Dam during a drought. There was no dispute that the resulting low flows would harm the downstream fishery, but the court held that an EIS was unnecessary, seeing the Bureau as preserving the status quo by simply operating the dam as it had in previous droughts.¹⁵⁶ Relying on *Upper Snake*, courts have refused to require environmental reviews when a project is operated in accordance with established plans or practices,¹⁵⁷ whether by the Bureau or the Corps.¹⁵⁸ NEPA does apply, however, if the agency proposes to *change* the operating plans or practices for a project;¹⁵⁹ thus, the Bureau “does NEPA” before making a new commitment to supply water from one of its projects,¹⁶⁰ as does the Corps when it produces a new water control manual for one of its projects.¹⁶¹

154. See *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 355–56 (1989).

155. *Upper Snake River Chapter of Trout Unlimited v. Hodel*, 921 F.2d 232 (9th Cir. 1990).

156. *Id.* at 235.

157. For an argument that the courts should revisit the *Upper Snake* holding, see *infra* notes 352–363 and accompanying text.

158. *Id.* at 292–96 (discussing *Upper Snake* and cases applying it); see also *Raymond Proffitt Found. v. Army Corps of Eng’rs*, 175 F. Supp. 2d 755, 770–72 (rejecting NEPA claims regarding the Corps’ releases of water from a flood control dam, finding *Upper Snake* persuasive on this point).

159. See *San Luis & Delta-Mendota Water Auth. v. Jewell*, 747 F.3d 581, 646 (holding that the Bureau needed to comply with NEPA before adopting and implementing a RPA for operation of the Central Valley Project for purposes of complying with the ESA).

160. See, e.g., *Ctr. for Envtl. Law & Policy v. Bureau of Reclamation*, 655 F.3d 1000 (9th Cir. 2012) (reviewing the Bureau’s environmental review on a proposed allocation of water in Lake Roosevelt for water supply).

161. *In re Operation of Mo. River Sys. Litig.*, 421 F.3d 618, 627 (8th Cir. 2005) (noting that the Corps produced an Environmental Impact Statement in the process of updating its “master manual” for operating its projects in the Missouri River System); *id.* at 636–37

In sum, federal water projects are operated under a complex set of legal requirements. While the authorizing statutes for a particular project are of primary importance in setting the operating priorities for that project, there are also other factors including programmatic statutes, environmental laws, and other legal and practical considerations. Subject to these requirements, however, each agency remains largely free to set its own policies and practices as to developing and revising operations plans for its projects. The next Part focuses on these policies and practices for the Corps and the Bureau, then addresses a range of factors that may influence an agency's choices regarding operations planning for its projects.

IV. OPERATIONS PLANNING FOR FEDERAL WATER PROJECTS

While the Corps and the Bureau both operate large numbers of dams, each agency has its own approach to establishing and revising operating plans for its projects. The Corps has a fairly detailed policy on the subject, updated in 2016 in a new regulation.¹⁶² The Bureau's parallel policy is much more general, set forth in its internal Reclamation Manual.¹⁶³ While there is a major difference in official policy, however, in actual practice the two agencies are fairly similar in regard to official reviews and revisions of their project operating plans.

A. Corps Policies on Project Operating Plans

The Corps' Water Control Management regulation¹⁶⁴ sets forth "policies governing water control management activities as

(rejecting the argument that the Corps was required to provide further explanation for why it rejected the alternative that was best for wildlife).

162. Dep't of the Army, U.S. Army Corps of Eng'rs, Eng'r Regulation No. 1110-2-240, Engineering and Design—Water Control Management (May 30, 2016) [hereinafter Water Control Management Rule]. The 2016 rule superseded an earlier rule of the same number, adopted in 1982. *Id.* ¶ 1-1 (b).

163. The Bureau's policy on the Reclamation Manual ("RM") states, "Reclamation will use the RM to establish and formally communicate, internally and externally, Reclamation-wide requirements necessary for the consistent and efficient accomplishment of its mission. All requirements set forth in the RM constitute official Reclamation-wide mandates." U.S. Bureau of Reclamation, Reclamation Manual: Policy RCD P03, at 4 (Apr. 13, 2015).

164. The prior Corps regulation on this subject was codified at 33 C.F.R. § 222.5. The new regulation, which superseded the codified version from 1982, does not indicate whether it will also be codified.

required by Federal Law and directives, including the establishment of water control plans as appropriate,” for Corps reservoirs and other projects involving storage.¹⁶⁵ Congress required the Corps to adopt such regulations, and to operate its projects in accordance with them, in the 1944 Flood Control Act.¹⁶⁶

The applicable rule requires the Corps to develop “water control plans” for its reservoirs, the purpose of which is to ensure that the project is operated in accordance with its authorizing legislation and other relevant law.¹⁶⁷ Water control plans are to “include coordinated regulation schedules for project/system regulation and any additional provisions required to collect, analyze and disseminate data; prepare detailed operating instructions;” and operate projects safely and appropriately.¹⁶⁸ Thus, the water control plan for a project is the operating regime that sets the parameters for reservoir releases throughout the year to ensure that the project operates to serve its authorized purposes.

The rule identifies numerous factors the Corps must consider in developing water control plans, in addition to both general and project-specific legal requirements.¹⁶⁹ One such factor is “water conservation as a national priority”—that is, providing storage for water supply to the extent consistent with project purposes.¹⁷⁰ The rule also calls on the Corps to manage water “in accordance with the [Corps’] role as an environmental steward,” and to operate its projects “in support of enhanced ecosystem sustainability” where consistent with project purposes.¹⁷¹ It also requires that project operations “shall be evaluated for adaptation to climate change.”¹⁷²

165. Water Control Management Rule, *supra* note 162, ¶ 1-1. Along with its own projects, the Corps also has regulatory responsibility for flood control and navigation operations at some non-Corps water projects, some of which are not even federal. This rule also addresses the Corps’ water management responsibilities at these non-Corps projects. *Id.*

166. Section 7 of the 1944 Act requires the Corps “to prescribe regulations for the use of storage allocated for flood control or navigation at all reservoirs constructed wholly or in part with Federal funds provided on the basis of such purposes, and the operation of any such project shall be in accordance with such purposes.” Flood Control Act of 1944, Pub. Law No. 78-534, § 7, 58 Stat. 887, 890 (codified at 33 U.S.C. § 709).

167. Water Control Management Rule, *supra* note 162, ¶ 2-2(a).

168. *Id.* ¶ 3-2(b).

169. *Id.* ¶ 2-3(a)–(b).

170. *Id.* ¶ 2-3(d) (noting that “water managers [must] determine whether improvement can be made in water control management procedures during low-water periods within current authorities”).

171. *Id.* ¶ 2-3(e).

172. *Id.* ¶ 2-3(i).

Finally, the Corps must work with all stakeholders who may be affected by project operations in developing its water control plans,¹⁷³ and provide for public involvement in the process.¹⁷⁴

Completed water control plans are incorporated into water control manuals.¹⁷⁵ “In general, a water control manual defines rules or provides guidance for direction, and operation, and management of water storage at an individual project or system of projects.”¹⁷⁶ A manual must contain additional elements beyond the water control plan, including special operating or management rules for “emergency situations, including droughts;”¹⁷⁷ thus, each manual should have a drought contingency plan.¹⁷⁸

Significantly, the rule requires the Corps to review and update its water control plans at least every ten years.¹⁷⁹ It further provides:

They shall be revised as necessary to conform with changing requirements resulting from developments in the project area and downstream, improvements in technology, improved understanding of ecological response and sustainability, new legislation and other relevant factors, provided such revisions comply with existing federal regulations and established Corps policy.¹⁸⁰

Thus, review and revision of water control plans is not merely a technical exercise, but should address changes in law and policy, evolving needs in the area where the project is located, environmental issues in light of current science, and other factors. The rule specifically allows water control plan revisions to address

173. The rule mandates that water control plans “will be developed in concert with all basin interests that are impacted or could be impacted by or have an influence on project regulation. Close coordination shall be maintained with all appropriate international, federal, state, regional and local agencies” in developing and implementing water control plans. *Id.* ¶ 3-2(d).

174. *Id.* ¶¶ 1-1, 5-2.

175. The rule specifies that developed plans “will be documented clearly in appropriate water control manuals.” *Id.* ¶ 3-2(b).

176. *Id.* ¶ 3-1(a). A group of projects with related purposes located within a particular river basin will be governed by a “master manual.” *Id.*

177. *Id.* ¶ 3-1(f).

178. Another part of the rule states that “all water control management plans shall have an associated drought contingency plan.” *Id.* ¶ 2-3(d).

179. *Id.* ¶ 3-2(j).

180. *Id.* ¶ 3-1(e). The old rule had a virtually identical statement at 33 C.F.R. § 222.5(g)(3), except that it did not include the phrase “improved understanding of ecological response and sustainability.”

environmental flow objectives.¹⁸¹ It also requires the Corps to inform and involve the public when it goes to change a water control plan,¹⁸² as well as coordinate with stakeholders in the basin.¹⁸³

B. Bureau Policies on Project Operating Plans

In contrast to the Corps, the Bureau has no rules on establishing or revising the operating plans for its projects. The Bureau has always had general rulemaking authority under section 10 of the 1902 Reclamation Act,¹⁸⁴ but never the statutory directive that Congress gave the Corps on this subject.¹⁸⁵ To the extent that the Bureau has official policies on review of project operations, they appear in the Reclamation Manual, a collection of internal guidance documents covering several dozen topics.¹⁸⁶

The Bureau's most relevant guidance appears to be a Directive and Standard on "Review and Operation (RO&M) Program Examination of Associated Facilities."¹⁸⁷ The document calls on the Bureau to conduct regular RO&M reviews for various purposes, including to "ensure facilities are operated effectively (excluding powerplants);" "protect public interests, safety, and the environment;" and "improve water management/conservation."¹⁸⁸ "[T]he examination is expected to be representative of both the traditional [operations & maintenance] activities and more

181. "Revisions and updates may incorporate upstream and downstream environmental flow objectives when compatible in accordance with authorization and approved purposes. Environmental flow may include both operational and structural modification of [Corps] facilities to improve the ecological sustainability of riverine ecosystems." *Id.* ¶ 3-2(g).

182. Conditions that require public involvement and public meetings include . . . revision or update of a water control manual that changes the water control plan in a way that impacts the public or changes the documented impact of the project." *Id.* ¶ 5-2(b).

183. *Id.* ¶ 5-2.

184. 43 U.S.C. § 373 (2012).

185. See *supra* note 166 and accompanying text.

186. *Reclamation Manual*, RECLAMATION, <http://www.usbr.gov/recman/index.html> [<https://perma.cc/Z5FX-C9DQ>] (last updated Mar. 23, 2017). The manual is organized into twenty-one categories, and contains several dozen "Policies" and over a hundred "Directives and Standards."

187. U.S. Bureau of Reclamation, Reclamation Manual: Directives and Standards FAC 01-04 (Apr. 29, 2009). A parenthetical at the end of the title clarifies that this Directive and Standard applies only to facilities other than high- and significant-hazard dams.

188. These are three of the nine stated purposes for these examinations. *Id.* at 7. This policy excludes power plants, which are covered by a different policy that also provides for periodic reviews of power operations at Bureau projects. U.S. Bureau of Reclamation, Reclamation Manual: Directives and Standards FAC 04-01 (June 5, 2015).

contemporary (environmental and public interest) types of issues.”¹⁸⁹ Reviews are to be conducted at least every six years, but could be more frequent based on specified factors including “the existence of significant public interests relative to the facility’s operation.”¹⁹⁰ The document calls for “an increased emphasis on the ‘operations’ aspects, especially how the operations involve public interests,” but also says that traditional operations and maintenance activities will remain “the primary focus” of examinations. It also declares that the main objective of these inspections is preventive *maintenance* for the sake of avoiding problems with Bureau facilities and the services they provide,¹⁹¹ indicating that potentially beneficial changes in *operations* are at most a secondary concern.

No other guidance document in the Reclamation Manual seems directly relevant on this issue, although a few others contain general statements that could be read as supporting reviews of long-term operating plans. For example, the policy titled “The Bureau of Reclamation’s Commitment to Environmental Stewardship”¹⁹² declares that the Bureau will “[i]ncorporate environmental considerations into long-term water and power operations and day-to-day activities.”¹⁹³ One of the newest policies declares that the Bureau will “integrate climate change adaptation

189. Under the heading “Content,” the document lists nineteen items that an examination might cover, including “water operations; water management and conservation; . . . endangered species; habitat/wetlands; environmental impacts; and compliance with mitigation.” *Id.* at 7–8.

190. *Id.* at 10.

191. The following paragraph is the introduction to this Directive and Standard:

The RO&M Program was established by Reclamation in 1948 as a periodic review and field examination program of constructed project facilities and systems. The primary objective of the program and related field examinations continues to be the promotion of a preventive maintenance philosophy to identify deficiencies and issues at an early stage, and through recommended actions, avoid more significant concerns such as service interruptions, structural failures, and extraordinary operation and maintenance (O&M) activities. By avoiding such concerns, the service lives of these structures, facilities, and systems can be lengthened, and the need for significant outlays by Reclamation and/or the related operating entity (and associated water users) can also be avoided.

Id. at 1.

192. U.S. Bureau of Reclamation, Reclamation Manual: Policy ENV P05 (May 6, 2016).

193. *Id.* at 3.

strategies into appropriate planning, programs, investments, and operations.”¹⁹⁴

This last policy reflects the SECURE Water Act,¹⁹⁵ which directs the Bureau not only to identify and assess potential water-related risks of climate change, but also to develop adaptation strategies for addressing those risks.¹⁹⁶ The statute lists several potential adaptation strategies, starting with “the modification of any reservoir storage or operating guideline,” and “the development of new water management, operating, or habitat restoration plans.”¹⁹⁷ Although the statute calls for identifying risks and developing strategies at the level of river basins,¹⁹⁸ the Bureau has also produced an agency-wide *Climate Change Adaptation Strategy*.¹⁹⁹ The document states four goals, including “Increase Water Management Flexibility,” and “Enhance Climate Adaptation Planning,”²⁰⁰ both of which would suggest the potential value in reviewing operations plans and revising them to enhance flexibility and prepare for the potential impacts of climate change.

C. Reasons for Agency Reluctance to Review and Revise Operating Plans

The foregoing policies indicate that both the Corps and the Bureau see value in periodically reviewing the operating plans for their projects, and even seem to say that both should already be doing such reviews. In fact, however, neither agency makes a regular practice of revising its operating plans. This disconnect between policy and practice strongly suggests that the Corps and the Bureau have their reasons for maintaining the status quo, and indeed they do: leaving existing plans in place avoids cost,

194. U.S. Bureau of Reclamation, Reclamation Manual: Policy CMP P16, at 4 (Mar. 20, 2015) (titled “Climate Change Adaptation”).

195. Omnibus Public Land Management Act of 2009, Pub. L. No. 111-11, § 9503, 123 Stat. 991, 1332.

196. 42 U.S.C. § 10363 (2012).

197. The Bureau is to “consider and develop” these strategies “in consultation with appropriate non-Federal participants.” *Id.* § 10363(b)(4).

198. The statute calls on the Bureau to identify risks of climate change “to the water supply of each major reclamation river basin,” *id.* § 10363(b)(2), and to analyze the potential impact of the identified risks for each of those basins, *id.* § 10363(b)(3). It then directs development of adaptation strategies for each of the risks analyzed under subsection (b)(3), tying the strategies to the basin-specific impact assessments. *Id.* § 10363(b)(4).

199. U.S. BUREAU OF RECLAMATION, CLIMATE CHANGE ADAPTATION STRATEGY (2014).

200. *Id.* at 14.

minimizes controversy, and limits litigation risk for the operating agencies, at least in the short term.

Reluctance to spend money on the review process is one obvious reason why the agencies rarely revise their operating plans. While the cost of a review could vary greatly from project to project, NEPA compliance alone would likely cost more than a million dollars, and a complex Environmental Impact Statement might cost several million.²⁰¹ A recent Government Accountability Office (“GAO”) study²⁰² suggests that funding may be the biggest obstacle to such reviews, at least within the Corps:

Corps guidance directs districts to periodically review and revise water control manuals, as necessary, to conform to changing requirements resulting from land development in the area, improvements in technology, and the availability of new hydrologic data, among other things. Some district officials said water control manuals have not been consistently updated due to changing conditions in the watershed, primarily due to funding constraints. Corps headquarters officials said there is not a Corps-wide process in place to assess whether manuals should be updated; rather it is up to the discretion of the districts to do so. Some district officials said that they had requested funding to update water control manuals but did not receive the requested funding to conduct such updates.²⁰³

Thus, while the official policy seems to encourage (and even require) operating plan revisions, the Corps in practice has not prioritized agency resources to do the job. While the Bureau’s policies on the subject are weaker, the Corps’ track record suggests that policy has not been the largest factor behind the agencies’ lack of progress in revising operations plans.

While agencies are loathe to spend money on new initiatives in times of tight budgets, they are also reluctant to stir up controversy

201. In a report on NEPA compliance by various federal agencies, the Government Accountability Office found that the cost of NEPA reviews can vary widely based on the complexity and scope of the project, but that little information exists on how much agencies actually spend on NEPA analyses. U.S. GOV’T ACCOUNTABILITY OFFICE, GAO-14-370, NATIONAL ENVIRONMENTAL POLICY ACT: LITTLE INFORMATION EXISTS ON NEPA ANALYSES 11–12 (2014). One agency (the Department of Energy) reported that the average cost of its Environmental Impact Statements in recent years had been \$6.6 million, although the most recent data showed average costs of less than half that amount. *Id.* at 13.

202. U.S. GOV’T ACCOUNTABILITY OFFICE, GAO-15-660, ARMY CORPS OF ENGINEERS: EFFORTS TO ASSESS THE IMPACT OF EXTREME WEATHER EVENTS (2015).

203. *Id.* at 19.

that they might avoid by maintaining the status quo. Given some of the fierce disputes between competing interests that both the Corps and the Bureau have faced over their dam operations,²⁰⁴ it is easy to understand why neither would want to raise the risk of triggering new ones. And while a project's established operating practices may cause environmental problems or inhibit recreational use, for example, those practices may be so familiar that they are basically taken as a given by people in the affected area. A proposed change, however, might well raise concerns about negative impacts—especially to (and among) those who benefit the most from current operations.

The interests of project beneficiaries are especially significant for Bureau projects, which store and deliver water for the benefit of consumptive water users; while most of this water goes to farmers, Bureau projects also supply part of the water used by millions of city dwellers, especially in the Southwest.²⁰⁵ Nearly all of these users receive water through an entity such as an irrigation district or municipal water utility, which in turn has a detailed water supply contract with the Bureau.²⁰⁶ The legal interests of water suppliers and users in Bureau project water is an exceedingly complex topic that varies based on several factors,²⁰⁷ but for purposes of this Article, two points should be noted. First, users who have had their deliveries of Bureau project water reduced for environmental reasons have sometimes sued the government for compensation, and while the law is still developing in this area, they have had some success.²⁰⁸ Second, users who have come to rely on project water tend to be viewed sympathetically by key decision-makers—by elected officials,²⁰⁹ certainly, but also by judges,²¹⁰ and importantly

204. See *supra* Section II.B.

205. The Bureau claims that forty million people rely on water supplied from the Colorado River. *About Us—Fact Sheet*, *supra* note 43.

206. See Reed D. Benson, *Whose Water Is It? Private Rights and Public Authority over Reclamation Project Water*, 16 VA. ENVTL. L.J. 363, 393–401 (1997) (explaining Bureau water supply contracts and common provisions).

207. *Id.* at 426–27.

208. See A. DAN TARLOCK ET AL., *supra* note 108, at 505–24 (reviewing and synthesizing the results of cases involving alleged takings of project water, and/or breach of contract for delivery of project water, arising from delivery reductions associated with ESA compliance).

209. See HOLLY DOREMUS & A. DAN TARLOCK, *WATER WAR IN THE KLAMATH BASIN* 150–61 (2008) (describing various types of political support for Klamath Basin irrigators, especially following their loss of most of their Bureau project water supplies in 2001).

210. Consider, for example, U.S. Supreme Court Justice Brennan's concurrence in a case pitting an Indian tribe seeking water to restore its all-important fishery, against irrigators

by the Bureau itself, for whom irrigators and other water users have long been the primary constituents.²¹¹

Another crucial factor for the agencies is avoiding the litigation risk they would face from revisiting their project operating plans. For the most part, the Corps and the Bureau are able to operate their projects with little risk of being challenged in court, so long as the agencies are not changing their established operating practices. While the Administrative Procedure Act (“APA”) generally provides for judicial review of “agency action,”²¹² a plaintiff suing the Corps or the Bureau must be able to show how the agency’s operations are contrary to law,²¹³ and plaintiffs seeking revised dam operations have had little success except under section 7 of the ESA.²¹⁴ In theory the agency could be sued for “unreasonably” delaying revision of its operating plan,²¹⁵ but the Supreme Court has held that agency inaction is reviewable under the APA only where the plaintiff alleges that the agency has failed to take a specific action that it is legally required to take.²¹⁶ Thus, even if the Corps or Bureau is operating a dam under an old plan that is arguably obsolete, the surest way to avoid legal challenges is to maintain the status quo.

If the Bureau or the Corps were to adopt a new operating plan for one of their projects, that would be reviewable agency action,

defending their longstanding access to Bureau project water. Justice Brennan clearly sympathized with the tribe, but agreed that irrigators’ rights should be protected: “In the final analysis, our decision today is that thousands of small farmers in northwestern Nevada can rely on specific promises made to their forebears two and three generations ago, and solemnized in a judicial decree, despite strong claims on the part of the Pyramid Lake Paiutes.” *Nevada v. United States*, 463 U.S. 110, 145 (1983) (Brennan, J., concurring).

211. See *DOREMUS & TARLOCK*, *supra* note 209, at 146–47 (describing the Bureau as “closely aligned with the irrigators, with a primary goal of maintaining the water status quo,” and as “a good example of ‘public choice’ at work,” traditionally seeking to maximize the agency’s own power and budget by serving the will of powerful constituencies and politicians).

212. 5 U.S.C. § 704 (2012).

213. See *id.* § 706(2)(A) (requiring a reviewing court to “hold unlawful and set aside agency action” that is “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law”).

214. See *infra* notes 225–233 and accompanying text. Other than section 7 of the ESA, federal environmental laws have generally gained little traction in addressing dam operations. See, e.g., *Nat’l Wildlife Fed’n v. Consumers Power Co.*, 862 F.2d 580 (6th Cir. 1988) (declining to require a Clean Water Act section 402 permit for dam operations, despite the presence of dead fish and fish parts in hydropower dam releases).

215. See 5 U.S.C. § 706(1) (requiring a reviewing court to “compel agency action unlawfully withheld or unreasonably delayed”).

216. *Norton v. S. Utah Wilderness All.*, 542 U.S. 55, 64 (2004).

although a reviewing court could be expected to give considerable deference to the agency's operational choices in most circumstances.²¹⁷ The greater litigation risk for the agency comes from triggering NEPA,²¹⁸ and thereby opening the door for a challenge to whether the agency's environmental review satisfied NEPA requirements as interpreted by the courts.²¹⁹ The agency's concern would be that if it adopted a new operating plan that some entity did not like,²²⁰ that entity would sue the agency for allegedly violating NEPA, and might convince a court to enjoin the new plan pending an adequate environmental review.

While the risk of NEPA litigation is real, one could argue that the agencies should not be overly concerned about it in this context. For one thing, there are fewer NEPA challenges than one might expect: the national average has generally been roughly 100 cases per year for most years since the mid-1990s.²²¹ Most of these challenges fail, as the government wins the majority of NEPA cases, and in some years the great majority.²²² Moreover, even if a court finds a NEPA violation, it may allow the agency action to proceed pending compliance; the Supreme Court has ruled that a court in a

217. *See, e.g.*, *Raymond Proffitt Found. v. U.S. Army Corps of Eng'rs*, 343 F.3d 199, 211–12 (3d Cir. 2003) (rejecting a challenge to a revised water control manual for a Corps reservoir on the Lehigh River, noting that the Corps has broad discretion in carrying out its environmental protection mission under a 1990 statute).

218. The Bureau's internal guidance on NEPA, relying on cases holding that NEPA is not triggered by "routine" project operations, declares that NEPA does not apply to "Operational decisions on ongoing Reclamation projects where there would be no major changes in existing operations or no new information relevant to potentially significant effects (i.e., maintenance of the status quo)." U.S. BUREAU OF RECLAMATION, RECLAMATION'S NEPA HANDBOOK 3-4 (2012).

219. In the decades since its enactment, "interested parties have filed thousands of NEPA lawsuits. Indeed, NEPA's seemingly innocuous EIS requirement has led to more lawsuits than any other environmental statute." JAMES RASBAND ET AL., NATURAL RESOURCES LAW AND POLICY 255 (1st ed. 2004).

220. Environmental groups are not the only ones who can and do bring NEPA litigation. For example, in their challenge to the Bureau's ESA compliance in operating the Central Valley Project, irrigators concerned with their water supplies challenged the Bureau for failing to do a NEPA review before choosing an ESA compliance strategy. The courts agreed that the Bureau needed to do an Environmental Impact Statement, rejecting the government's arguments that NEPA did not apply in that context. *San Luis & Delta-Mendota Water Auth. v. Jewell*, 747 F.3d 581, 645–55 (9th Cir. 2014).

221. U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 201, at 20 (summarizing Council on Environmental Quality data).

222. *Id.* at 21–22 (reporting that the government wins most NEPA cases, including over two-thirds of all judicial dispositions in 2011, and twenty-four out of twenty-eight cases decided in the Courts of Appeals in 2012).

NEPA case should not issue a temporary injunction unless irreparable harm is likely,²²³ or a permanent injunction unless warranted under a standard four-factor test.²²⁴ Finally, even if a court were to enjoin the new operations plan pending NEPA compliance, the agency could presumably continue operating the project under the prior plan, as it did for many years. Thus, while it may be reasonable for the agencies to fear NEPA challenges generally, it appears that revising the operations plan for any given project would pose an objectively low risk of a bad litigation outcome.

In light of the foregoing factors, it is not at all surprising that the Corps and the Bureau have not made a regular practice of reviewing and revising their project operating plans. However strong the policy arguments in favor of revisiting these plans, the disincentives so far have proved to be stronger, and seem likely to remain so unless the agencies receive a significant push from elsewhere in government. The following Section examines some of the circumstances that have prompted the Corps or the Bureau to reconsider a project's operating regime.

D. Factors that May Prompt Agency Review of a Project's Operations

Although neither agency makes a general practice of regularly revising its project operating plans, both the Corps and the Bureau will review operations of a particular project (or system of projects) as needed to meet legal requirements, and sometimes will do so for other reasons. This subsection identifies factors that have caused the agencies to revise operating regimes, and provides examples of projects or basins where these factors have prompted action.

1. Endangered Species Act Requirements

As noted above,²²⁵ the ESA imposes both substantive and procedural duties on federal agencies regarding their actions that may affect protected species. For the Corps and the Bureau, these

223. *Winter v. Nat. Res. Def. Council*, 555 U.S. 7, 22–23 (2008).

224. The four factors are irreparable injury, inadequacy of other relief to address that injury, balancing of hardships, and public interest. *Monsanto Co. v. Geertson Seed Farms*, 561 U.S. 139, 156–58 (2010).

225. *See supra* notes 127–140 and accompanying text.

duties may apply to the operations of existing projects²²⁶ where those operations potentially could affect a listed species. The Corps or the Bureau prepare a “biological assessment” that explains proposed operating practices for the project, and states the agency’s view of whether those practices may affect a listed species.²²⁷ A “may affect” determination leads to formal consultation with the U.S. Fish & Wildlife Service (“Service”) (or National Marine Fisheries Service, if the affected species is a type of salmon or other oceangoing species), resulting in a biological opinion issued by the Service.²²⁸ In the end, the Service must be able to determine that the project may be operated—either as proposed, or under a “reasonable and prudent alternative” developed through the consultation process—without jeopardizing the continued existence of the species.²²⁹

As more river-dependent species were listed as threatened or endangered in the 1980s and 1990s, the Corps and the Bureau had to consult on the operations of many of their projects. Several projects have been the subject of multiple consultations, either because of short-term biological opinions, judicial challenges to the project’s ESA compliance, or some combination of both; examples include the Corps’ projects in the Missouri River System²³⁰ and the

226. Because section 7 of the ESA duties only apply to discretionary actions, however, the agencies have an incentive to argue that they have little or no discretion in how they operate their projects. See Reed D. Benson, *Dams, Duties, and Discretion: Bureau of Reclamation Water Project Operations and the Endangered Species Act*, 33 COLUM. J. ENVTL. L. 1, 32–40 (2008) (addressing the issue of the Bureau’s discretion in operating projects in the “Middle” Rio Grande Basin of New Mexico). The Corps’ Chief Counsel issued guidance in 2013 that essentially encouraged Corps personnel to take a narrow view of the agency’s discretionary actions for purposes of limiting the scope of its ESA duties. In working with the fish and wildlife agencies, the guidance states, “it is important for the Corps to define and describe our agency’s ‘action’ in a precise manner, to ensure that any measures intended to minimize adverse impacts pursuant to the ESA accurately account for only those activities over which the Corps has discretion.” Memorandum from Earl H. Stockdale, Chief Counsel, U.S. Army Corps of Eng’rs, to “ALL COUNSEL, HQ, DEV, DIST, CENTER, LAB & FOA OFFICES” (June 11, 2013) (on file with author).

227. 16 U.S.C. § 1536(c) (2012).

228. *Id.* § 1536(b).

229. *Id.* § 1536(b)(4). Once consultation has been successfully completed, the Bureau or Corps may operate the project even though its operations incidentally cause harm to listed species. Such “take” would normally be prohibited under section 9 of the ESA, *id.* § 1538(a), but an “incidental take statement” issued by the Service at the close of consultation provides the operating agency with legal protection for a specified level of take, *id.* § 1536(b)(4)(C).

230. The Corps faced litigation on several fronts over its Missouri River System operations in the early 2000s, including a challenge to its compliance with the ESA under

Bureau's projects in the Klamath Basin.²³¹ On the two major river systems of the West Coast, the agencies have been locked in a seemingly endless cycle of consultation and litigation over their project operations, with ongoing controversy surrounding both the Corps' activities in the Columbia Basin²³² and the Bureau's operation of the Central Valley Project.²³³

2. Congressional Directives

As discussed above,²³⁴ most projects have authorizing statutes that specify project purposes, which in turn determine their operating priorities. In the absence of further congressional direction regarding a particular project, the operating agency may believe its best course is to maintain its established operating plans and practices. Congress has sometimes provided such direction, however, and its actions have taken at least three different forms.

First, Congress has sometimes revised the authorization of an existing project, generally by adding a new purpose or set of purposes. For example, in authorizing "rehabilitation" of the Bureau's Belle Fourche Project, Congress added project purposes including recreation and "fish and wildlife conservation and development."²³⁵ Congress gave more specific direction when it revised the authorization for the John Martin Reservoir on the Arkansas River, requiring the Corps to use up to 10,000 acre-feet of flood control space for a permanent fish and wildlife pool.²³⁶ The

more than one biological opinion. *See* Zellmer, *supra* note 69, at 319–33 (explaining the Corps' ESA efforts on the Missouri and litigation challenging them).

231. For example, litigation forced the Bureau to consult on its project operations in the Klamath Basin in 2001; it had failed to consult on its 2000 Klamath Project operations, even though it had completed a series of one-year consultations in the 1990s. *See* Benson, *supra* note 64, at 218–25. A ten-year biological opinion issued in 2002 was challenged, and key elements did not survive judicial review. *Pac. Coast Fed'n of Fishermen's Ass'ns v. Bureau of Reclamation*, 426 F.2d 1082 (9th Cir. 2005).

232. *See Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 184 F. Supp. 3d 861 (D. Or. 2016) (setting aside another Federal Columbia River Power System biological opinion after tracing the history of consultation and litigation on the issue).

233. *See San Luis & Delta-Mendota Water Auth. v. Jewell*, 747 F.3d 581 (9th Cir. 2014) (upholding the biological opinion, but requiring NEPA review of the Bureau's actions regarding reasonable and prudent alternatives in operating the Central Valley Project, after reviewing the history of ESA disputes on the issue since 2005).

234. *See supra* Section III.A.

235. The Belle Fourche Project, one of the Bureau's oldest, was first authorized in 1904 under the terms of the 1902 Reclamation Act, rather than project-specific legislation. *See Act of Nov. 17, 1983*, Pub. L. No. 98-157, 97 Stat. 989.

236. Flood Control Act of 1965, Pub. L. No. 89-298, § 204, 79 Stat. 1073, 1078.

best-known and most dramatic example of revising project purposes came in the 1992 Central Valley Project Improvement Act,²³⁷ whereby Congress not only added fish and wildlife conservation as purposes of the project,²³⁸ but also directed the Bureau to begin managing 800,000 acre-feet of project water for fish and wildlife purposes.²³⁹

Second, Congress has occasionally called on dam operating agencies to develop a new operating regime for a project or system of projects. The statutes do not dictate any particular outcome, but establish certain procedural and substantive requirements for the new regime. The Truckee-Carson-Pyramid Lake and Water Rights Settlement Act²⁴⁰ directs the Interior Secretary to negotiate (with the States of California and Nevada)²⁴¹ an operating agreement for specified Bureau projects in the Truckee River Basin, and specifies certain requirements for the resulting operations.²⁴² This direction eventually resulted in a new Truckee River Operating Agreement, intended to provide a range of environmental and water supply benefits for the basin.²⁴³ The Grand Canyon Protection Act²⁴⁴ directed the Bureau to operate Glen Canyon Dam so as to “project, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established,”²⁴⁵ while still following established law governing the Colorado River.²⁴⁶ The statute

237. Reclamation Projects Authorization and Adjustment Act of 1992, Pub. L. No. 102-575, tit. XXXIV, 106 Stat. 4600, 4706.

238. *Id.* § 3406(a).

239. *Id.* § 3406(b)(2).

240. Fallon Paiute Shoshone Indian Tribes Water Rights Settlement Act of 1990, Pub. L. No. 101-618, tit. II, 104 Stat. 3289, 3294. This statute contains provisions regarding the purposes and priorities of certain Bureau projects in the Truckee River Basin. *E.g.*, *id.* § 205(b) (allowing use of certain Bureau facilities to store non-project water); *id.* § 207(d) (prioritizing use of Stampede Reservoir and Prosser Creek Reservoir for fisheries restoration).

241. The statute calls for the Secretary to negotiate the agreement with the two states “after consultation with such other parties as may be designated by the Secretary, the State of Nevada or the State of California.” *Id.* § 205(a)(1).

242. These requirements relate to dam safety, flood control, fisheries, water rights, and operating costs. *Id.* § 205(a)(2). The statute then provides a non-exclusive list of nine subject areas that the agreement may address. *Id.* § 205(a)(3).

243. Truckee River Operating Agreement, 73 Fed. Reg. 74,031 (Dec. 5, 2008).

244. Reclamation Projects Authorization and Adjustment Act of 1992, Pub. L. No. 102-575, tit. XVIII, 106 Stat. 4600, 4669.

245. *Id.* § 1802(a).

246. *Id.* § 1802(b).

required completion of a final Environmental Impact Statement on Glen Canyon Dam within two years of enactment,²⁴⁷ and directed the Bureau to adopt new operating criteria and plans for the dam based on that EIS.²⁴⁸ After completing the required EIS, the Bureau adopted a new operating regime for Glen Canyon Dam, revising release patterns to benefit downstream environmental and recreational values.²⁴⁹

Third, Congress has enacted a few programmatic (rather than project- or basin-specific) statutes that give general authority or direction for the agencies to revisit dam operations.²⁵⁰ One notable example, known as “1135” authority,²⁵¹ authorizes the Corps to make “such modifications in the structures and operations of water resources projects constructed by the Secretary [of the Army] which the Secretary determines (1) are feasible and consistent with the authorized project purposes, and (2) will improve the quality of the environment in the public interest.”²⁵² Regarding water supply, Congress in 2014 directed the Corps to review its project “management practices, priorities, and authorized purposes” to determine their effects on water supplies in “arid regions,”²⁵³ and further ordered the Corps to publish a report with “a plan for reviewing the operations of individual projects, including a detailed schedule for future reviews of project operations.”²⁵⁴ As of this writing, it is too soon to say whether these recent enactments will prompt the Corps to change its approach to operating plan reviews.²⁵⁵

247. *Id.* § 1804(a).

248. *Id.* § 1804(c)(1). The statute required the Bureau, in developing these plans, to consult with the governors of the Colorado River Basin states, “and with the general public,” including “representatives of academic and scientific communities;” “environmental organizations;” “the recreation industry;” and “contractors for the purchase of Federal power produced at Glen Canyon Dam.” *Id.* § 1804(c)(3).

249. Operating Criteria and 1997 Annual Plan of Operations for Glen Canyon Dam, 62 Fed. Reg. 9447 (Mar. 3, 1997).

250. For a discussion of project-specific versus programmatic statutes, see *supra* Sections III.A–III.B.

251. See Benson, *supra* note 13, at 176–77 (summarizing the history of this authority, which originated in section 1135 of the 1986 Water Resources Development Act).

252. 33 U.S.C. § 2309a(b) (2012).

253. Water Resources Reform and Development Act of 2014, Pub. L. No. 113-121, § 1046(a)(2)(A), 128 Stat. 1193, 1251.

254. *Id.* § 1046(a)(2)(B).

255. See *infra* notes 331–337 and accompanying text.

3. Other Factors

Absent a legal requirement to do so, neither the Corps nor the Bureau makes a regular practice of reviewing its project operating plans. Such reviews are not prohibited, however, and the operating agency may be convinced to undertake one if there is a compelling reason to do so for a particular project; for example, the Corps has revised water control manuals after a flood showed the need for revised storage limits at one project, and after an inspection turned up dam safety concerns at another project.²⁵⁶ The Corps' rules on water control plans call for periodic review of existing plans,²⁵⁷ and identify a wide range of factors that may necessitate a revision.²⁵⁸

The same Corps rules also identify "possible need for storage reallocation (within existing authority and constraints)" as a factor to be considered in water control plans. The effort by Atlanta-area water suppliers to secure more water from the Corps' Lake Lanier has been the focus of a bitter and long-running battle in the southeastern ACF basin;²⁵⁹ following the Eleventh Circuit's ruling that public water supply is indeed an authorized project purpose,²⁶⁰ the Corps moved to revise and update the water control manual for its ACF projects.²⁶¹ Similarly, the Bureau undertook a review of potential operational changes at Lake Roosevelt on the Columbia River, in response to a push by the State of Washington for greater releases of stored water to meet a variety of needs.²⁶²

256. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-16-685, ARMY CORPS OF ENGINEERS: ADDITIONAL STEPS NEEDED FOR REVIEW AND REVISION OF WATER CONTROL MANUALS, at 13 (2016).

257. Water Control Management Rule, *supra* note 162, ¶ 3-2(j) (2).

258. According to the Corps' 2016 rule,

Water control plans will be revised as necessary to conform with changing requirements resulting from developments in the project area and downstream, improvements in technology, improved understanding of ecological response and ecological sustainability, new legislation, reallocation of storage, new regional priorities, changing environmental conditions and other relevant factors. At any time during project implementation, it may be appropriate to revise the water control plan.

Id. ¶ 3-2(j) (1).

259. *See supra* notes 56–63 and accompanying text.

260. *In re MDL-1824 Tri-State Water Rights Litig.*, 644 F.3d 1160 (11th Cir. 2011).

261. *See* Notice of Intent to Revise Scope of Draft Environmental Impact Statement for Updating the Water Control Manual for the Apalachicola-Chattahoochee-Flint River Basin, 77 Fed. Reg. 62,224 (Oct. 12, 2012).

262. *See* Ctr. for Envtl. Law & Policy v. Bureau of Reclamation, 655 F.3d 1000 (9th Cir. 2011) (upholding the Bureau's compliance with NEPA regarding the proposed change).

The Bureau in 2016 completed an ambitious review of the operating regime for one of its most important reservoirs: Lake Powell, formed by Glen Canyon Dam on the Colorado.²⁶³ The Bureau, along with the National Park Service,²⁶⁴ adopted a Long-Term Experimental and Management Program (“LTEMP”) that will serve as Glen Canyon Dam’s operating framework for the next twenty years.²⁶⁵ The agencies considered seven alternatives for the new LTEMP, presenting a range of potential operating regimes for Glen Canyon Dam.²⁶⁶ Three additional aspects of the LTEMP process offer some indication of the remarkable scope and complexity of this particular review. First, the review considered more than a dozen types of interests, ranging from water supply and hydropower, to recreational boating and fishing, to archaeological, cultural, and tribal resources.²⁶⁷ Second, the review took at least seven years to complete,²⁶⁸ and built on scientific studies going back at least a decade earlier.²⁶⁹ Third, the LTEMP EIS involved not only the Bureau and the Park Service, but an additional *fifteen* cooperating agencies: three other federal agencies, six tribes, three state agencies, two public utilities, and the Upper Colorado River Commission.²⁷⁰ In the end the Interior

263. U.S. DEP’T OF THE INTERIOR, GLEN CANYON DAM LONG-TERM EXPERIMENTAL AND MANAGEMENT PLAN FINAL ENVIRONMENTAL IMPACT STATEMENT, at ES-1–ES-8 (2016) [hereinafter LTEMP EIS] (explaining the purpose and scope of the review).

264. The Bureau shared the lead with the National Park Service because the latter agency is responsible for managing the Glen Canyon National Recreation Area (the centerpiece of which is Lake Powell) and the Grand Canyon National Park. *Id.* at ES-1.

265. U.S. DEP’T OF THE INTERIOR, RECORD OF DECISION FOR THE GLEN CANYON DAM LONG-TERM EXPERIMENTAL AND MANAGEMENT PLAN FINAL ENVIRONMENTAL IMPACT STATEMENT, at 5-10 (2016) [hereinafter LTEMP ROD].

266. *Id.* at 3-4. A more detailed explanation of the seven alternatives appears in the LTEMP EIS, *supra* note 263, at ES-18–ES-36.

267. LTEMP EIS, *supra* note 263, at ES-6–ES-8. Other issues include the endangered humpback chub; sediment; nonnative invasive species; riparian vegetation; and “natural processes,” which basically relates to ecosystem health and biodiversity.

268. The Interior Department published its Notice of Intent to proceed with the LTEMP in 2011, but that notice began by stating that Interior Secretary Ken Salazar announced the new review in December 2009. Notice of Intent to Prepare a Draft Environmental Impact Statement and Conduct Public Scoping on the Adoption of a Long-Term Experimental and Management Plan for the Operation of Glen Canyon Dam, 76 Fed. Reg. 39,435 (July 6, 2011).

269. *Id.* at 39,435.

270. The Upper Colorado River Commission can be seen as representing the interests of its member states of Colorado, New Mexico, Utah, and Wyoming. *See* Upper Colorado River Basin Compact, ch. 48, art. VIII, 63 Stat. 31 (1949). The other federal agencies cooperating in the LTEMP review are the Bureau of Indian Affairs, the Fish & Wildlife Service, and the

Department chose what it called the environmentally preferred alternative,²⁷¹ and while the new LTEMP does not differ greatly from the 1990s plan in terms of regular Glen Canyon operations,²⁷² the agency believed that the new plan struck the best balance for the full range of values addressed in the Grand Canyon Protection Act.²⁷³

What both agencies lack—and what Congress has asked of the Corps—is a program of regular, scheduled reviews of the operating plans for their projects. Other federal agencies, however, have long engaged in periodic review of operating licenses or resource management plans. The next Part briefly outlines these review requirements and considers their potential relevance for Corps and Bureau projects.

V. PERIODIC REVIEW REQUIREMENTS UNDER FEDERAL LAW

Periodic review may be unknown to the Corps and the Bureau, but it is a well-established requirement for other federal agencies responsible for managing natural resources. While there are countless examples that would arguably be relevant—such as the five-year duration of pollutant discharge permits under the Clean Water Act²⁷⁴—this Part focuses on two: revision of land/resource management plans by agencies responsible for managing federal lands, and relicensing of hydropower projects by the Federal Energy Regulatory Commission (“FERC”).

A. Land Management Plan Revisions

For the past forty years, federal land management agencies have been required to produce—and periodically revise—management plans for the lands and other resources they oversee. When Congress overhauled the statutes governing the Forest Service²⁷⁵

Western Area Power Administration (which markets the power generated at the dam). LTEMP EIS, *supra* note 263, at ES-1–ES-2 (stating that the LTEMP NEPA review involves fourteen cooperating agencies, but identifying fifteen).

271. LTEMP ROD, *supra* note 265, at 5.

272. *Id.* at 7.

273. *Id.* at 2, 10–11. The LTEMP represents the agencies’ effort to ensure that Glen Canyon Dam operations are consistent with the Grand Canyon Protection Act, although the statute does not specifically require this particular review of the operating regime developed in the 1990s. See *supra* notes 244–249 and accompanying text.

274. See 33 U.S.C. § 1342(b)(1)(B) (2012).

275. National Forest Management Act, Pub. L. No. 94-588, 90 Stat. 2949 (1976).

and the Bureau of Land Management (“BLM”)²⁷⁶ in 1976, planning requirements were a central feature of the new framework:

The reforms adopted in National Forest Management Act [“NFMA”] and the Federal Land Policy Management Act [“FLPMA”] were largely in response to public pressure to change the direction of public lands management from dominant, extractive use (grazing, timber, and mining) to multiple uses accommodating recreation, preservation, and a broader variety of public interests.

These statutes require the agencies to engage in a land-use planning process for management of the public lands. The plans (called various names by the different agencies) are usually in effect for 10–15 years. The public has played a key role in development of these plans, through comment and administrative appeal procedures and litigation.²⁷⁷

A generation later, when Congress substantially revised the governing law for the National Wildlife Refuge System,²⁷⁸ management plans for refuge units were a key element of the statute.

Planning mandates impose procedural duties on the agencies, but as the foregoing quote suggests, these requirements advance substantive goals for federal land management. The statutes prescribe several criteria and standards for the management plans,²⁷⁹ thus requiring each agency’s local plans to reflect national policy. Further, the agencies are required to follow their management plans in permitting or authorizing on-the-ground activities, allowing only those that comport with the plans.²⁸⁰ Thus,

276. Federal Land Policy and Management Act, Pub. L. No. 94-579, 90 Stat. 2744 (1976).

277. SANDRA B. ZELLMER & JAN G. LAITOS, PRINCIPLES OF NATURAL RESOURCES LAW 132–33 (2014) (footnotes omitted).

278. National Wildlife Refuge System Improvement Act, Pub. L. No. 105-57, 111 Stat. 1253 (1997). The “conservation plan” requirement for refuge units is codified at 16 U.S.C. § 668dd(e) (2012).

279. The planning section of NFMA specifies “required assurances” for plans, 16 U.S.C. § 1604(e), “required provisions” of plans, *id.* § 1604(f), and substantive requirements for Forest Service rules governing development and revision of plans, *id.* § 1604(g). The parallel FLPMA provision is slightly less prescriptive, but does dictate nine “criteria for development and revision” of BLM management plans. 43 U.S.C. § 1712(c) (2012). The statutory requirements for National Wildlife Refuge conservation plans are more like FLPMA’s than NFMA’s. 16 U.S.C. § 668dd(e)(2)–(3).

280. NFMA affirmatively mandates that “[r]esource plans and permits, contracts, and other instruments for the use and occupancy of National Forest System lands shall be

management plans are the key mechanism for ensuring that “individual management decisions are made not haphazardly but rather to promote some greater goal”²⁸¹ that Congress has set for that type of land; in other words, management plans provide “the link between the systemic mandate and the local project.”²⁸²

Two further points about federal land management planning are especially relevant here. First, these plans must be periodically reviewed and revised; the statutes mandate that plans for National Forests and National Wildlife Refuges be revised at least every fifteen years.²⁸³ Congress clearly believed that agencies should revise their plans in response to significant changes in conditions on the ground,²⁸⁴ and presumably also in response to changes in relevant laws and policies.²⁸⁵ Second, the statutes specifically require the agencies to involve the public²⁸⁶ in developing and revising management plans. NFMA directs the Forest Service to make new or revised plans locally available for at least ninety days before adopting them, and to “publicize and hold public meetings or comparable processes at locations that foster public

consistent with the land management plans.” 16 U.S.C. § 1604(i). FLPMA allows BLM to “issue management decisions to implement land use plans developed or revised under this section.” 43 U.S.C. § 1712(e). The National Wildlife Refuge statute mandates that the agency “shall manage the refuge or planning unit in a manner consistent with the plan.” 16 U.S.C. § 668dd(e)(1)(E). All three statutes also allow for plan amendments, meaning that a formerly prohibited activity may be allowed (or vice versa) without having to revise and update the entire plan.

281. Robert L. Fischman, *The National Wildlife Refuge System and the Hallmarks of Modern Organic Legislation*, 29 *ECOLOGY L.Q.* 457, 511 (2002).

282. *Id.* Rob Fischman has written extensively on “organic” statutes for resource management, and has called management planning requirements one of five “hallmarks” of such statutes. The others are purpose statements, designated use, substantive management criteria, and public participation. *Id.* at 510–13.

283. 16 U.S.C. § 1604(f)(5) (forest land and resource management plans); *id.* § 668dd(e)(1)(A) (refuge conservation plans). FLPMA has no parallel statutory timeframe for revising management plans, providing only that BLM “shall, . . . when appropriate, revise land use plans.” 43 U.S.C. § 1712(a).

284. *See* 16 U.S.C. § 1604(f)(5) (requiring plan revisions when the Forest Service “finds conditions in a unit have significantly changed”); *id.* § 668dd(e)(1)(E) (requiring the Fish & Wildlife Service to revise a conservation plan “at any time” if the agency “determines that conditions that affect the refuge or planning unit have changed significantly”).

285. For example, FLPMA requires that in developing and revising land use plans, BLM shall “provide for compliance with applicable pollution control laws.” 43 U.S.C. § 1712(c)(8). And all three statutes call for management plans to be developed in coordination with plans from other federal agencies and other levels of government.

286. As noted above, Rob Fischman has identified public participation as another one of the five hallmarks of “organic” statutes governing natural resource management at the federal level. *See* Fischman, *supra* note 281.

participation in the review of such plans or revisions”,²⁸⁷ the National Wildlife Refuge statute requires “a process to ensure an opportunity for active public involvement in the preparation and revision” of conservation plans.²⁸⁸ Congress clearly believed that people have a right to be heard as agencies are making decisions on the management of public resources.

Management planning for federal lands has certainly generated its share of disputes,²⁸⁹ as indicated by the years of policy and legal battles over the Clinton, Bush, and Obama administrations’ efforts to revise the Forest Service planning rules.²⁹⁰ Management planning serves vital purposes, however, in translating national policy direction to the local level and in giving people a meaningful chance to participate in management decisions. These benefits have made management planning a staple of federal natural resources law, applying in such diverse contexts as public lands grazing,²⁹¹ wild and scenic rivers,²⁹² and even fish and wildlife

287. 16 U.S.C. § 1604(d).

288. *Id.* § 668dd(e)(4)(A). The statute also requires the Fish & Wildlife Service to provide notice and comment on draft conservation plans. *Id.* § 668dd(e)(4)(B).

289. One recent example is the controversy over the Bureau of Land Management’s so-called “Planning 2.0” rule, which would have changed the agency’s approach to revising its Resource Management Plans, and which Congress recently blocked with a vote under the Congressional Review Act. See Kellie Lunney, *Trump Signs Resolution Repealing BLM Planning 2.0 Rule*, E&E NEWS PM (Mar. 27, 2017), <https://www.eenews.net/eenewspm/2017/03/27/stories/1060052142> [<https://perma.cc/R5Q5-BDVC>].

290. The Clinton administration had adopted a new planning rule in November 2000, but the new Bush administration replaced it with its own rule in 2005. After opponents convinced a court that the new rule had been adopted in violation of environmental laws, the agency quickly took steps to comply and issued a very similar rule. See National Forest System Land Management Planning, 73 Fed. Reg. 21,468, 21,468–69 (Apr. 21, 2008) (providing background on the adoption of the rule). The 2008 rule was also successfully challenged in court. *Citizens for Better Forestry v. U.S. Dep’t of Agric.*, 632 F. Supp. 2d 968 (N.D. Cal. 2009). The Obama administration then adopted its own rule, codified at 36 C.F.R. pt. 319, in 2012. National Forest System Land Management Planning, 77 Fed. Reg. 21,162 (Apr. 9, 2012). The preamble to the 2012 rule, which runs nearly 100 pages in the *Federal Register*, provides an overview of some of the issues that various entities have with planning on the National Forests.

291. Grazing on lands managed by the Bureau of Land Management may be addressed by the agency’s general management plans under FLPMA, 43 U.S.C. § 1712(a), and also by “allotment management plans” developed in consultation with those holding grazing leases or permits, *id.* § 1702(k). Congress directed BLM to use existing mandates, including the FLMPA planning process, to improve the condition of public rangelands. *Id.* § 1903(b).

292. The Wild and Scenic Rivers Act provides for designation of rivers that have certain outstanding values. 16 U.S.C. §§ 1271–87. The statute requires that for each river reach designated after 1985, the federal agency responsible for managing that reach “shall prepare a comprehensive management plan for such river segment to provide for the protection of

resources on military lands.²⁹³ Even the Bureau of Reclamation prepares Resource Management Plans for the *lands* it manages, and according to the Bureau's detailed guidance on the subject,²⁹⁴ these plans ordinarily should be updated at least every ten years.²⁹⁵

B. FERC Relicensing

Unlike the Bureau and the Corps, FERC is not a dam operator, but rather a dam regulator. It issues licenses for non-federal hydropower dams as provided by the Federal Power Act ("FPA"),²⁹⁶ and these licenses impose operating restrictions and requirements such as minimum downstream flows.²⁹⁷ Crucially, FERC licenses also have expiration dates, because the FPA limits them to a maximum term of fifty years.²⁹⁸ At the end of its license term, a project must be relicensed by FERC, meaning that federally regulated hydropower projects face what other large dams do not: legally mandated periodic review of their operating conditions.

Of course, that periodic review would be largely meaningless if relicensing merely involved renewal of the previous license with little or no change to key operating conditions. But Congress revised the FPA in the 1980s, giving greater weight to values beyond hydropower, and greater authority to other agencies to develop

the river values. The plan shall address resource protection, development of lands and facilities, user capacities, and other management practices necessary or desirable to achieve the purposes of this chapter." *Id.* § 1274(d)(1).

293. The Sikes Act, as amended in 1997, requires the Defense Secretary to establish these plans for each military installation with significant natural resources. The military must work with the Fish & Wildlife Service, and with the relevant state fish and wildlife agency, on an "integrated natural resources management plan" for the installation that "shall reflect the mutual agreement of the parties concerning conservation, protection, and management of fish and wildlife resources." *Id.* § 670a(a). Such plans are to be reviewed by the parties at least every five years. *Id.* § 670a(b)(2).

294. U.S. BUREAU OF RECLAMATION, RESOURCE MANAGEMENT PLAN GUIDEBOOK: PLANNING FOR THE FUTURE (2003).

295. *Id.* at I-8. The guidance also states that plans should be reviewed to determine if they need to be revised, based on factors such as new data or "changes in social, physical, environmental, or economic conditions." *Id.* at III-15.

296. 16 U.S.C. §§ 791a-828c.

297. See *California v. FERC*, 495 U.S. 490 (1990) (rejecting the state's attempt to impose higher downstream flow requirements than those contained in FERC's license for a new hydropower project).

298. 16 U.S.C. § 799.

license conditions that protect natural resources.²⁹⁹ Because such conditions would have economic impacts for the project owners, FERC was sometimes reluctant to incorporate them into new licenses, but courts overturned FERC's attempts to reject protective conditions issued by other federal agencies.³⁰⁰ In one relicensing case, a project owner challenged a new condition that significantly increased downstream flow requirements, arguing that the resulting loss of hydropower generation would make the project uneconomic to operate. The court upheld the condition nonetheless, because the amended FPA requires that current resource protection standards apply to new licenses, even for existing projects.³⁰¹

FERC relicensing is a large and complex topic³⁰² that has been addressed in much greater detail by other commentators over the years.³⁰³ For purposes of this Article focusing on Corps and Bureau projects, however, three points should be made about periodic review by FERC. First, hundreds of projects have gone (or are going) through the process over the past two decades; over 400

299. See Blumm & Nadol, *supra* note 14, at 87–88. Much of the article describes key judicial decisions that effectively gave greater protection to natural resource protection in FERC licensing decisions.

300. *Escondido Mut. Water Co. v. LaJolla Band of Mission Indians*, 466 U.S. 765, 776–77 (1984) (FERC must include license conditions developed by the Secretaries of Interior or Agriculture under section 4(e) of the Federal Power Act); *Am. Rivers v. FERC*, 201 F.3d 1186, 1210 (9th Cir. 2000) (FERC must impose conditions on fish passage developed by the Secretaries of Interior or Commerce under section 18 of the Act); see also *City of Tacoma v. FERC*, 460 F.3d 53, 64–65 (D.C. Cir. 2006) (holding that FERC could not impose unreasonably short deadlines on agencies issuing such conditions and refuse to accept those that were submitted late). Section 10 of the Federal Power Act allows other agencies to recommend certain conditions, but FERC is not bound to accept them. See Adell Louise Amos, *Hydropower Reform and the Impact of the Energy Policy Act of 2005 on the Klamath Basin: Renewed Optimism or Same Old Song?*, 22 J. ENVTL. L. & LITIG. 1, 6–7 (2007) (explaining the authority of federal and state fish and wildlife agencies to recommend license conditions under section 10(j) of the Act, and the authority of FERC to decline such conditions if it finds they are contrary to the Act).

301. *City of Tacoma*, 460 F.3d at 71–74. “In light of these sweeping changes in FERC’s statutory mandate, FERC not only has the authority but also the obligation to evaluate existing projects completely anew upon expiration of their license terms.” *Id.* at 73–74.

302. A recent article concludes that modern-day FERC hydropower licensing, with all of its substantive and procedural requirements, has become “one of the most complex processes in all of environmental law.” Dave Owen & Colin Apse, *Trading Dams*, 48 U.C. DAVIS L. REV. 1043, 1065 (2015).

303. See *id.*; Amos, *supra* note 300; Blumm & Nadol, *supra* note 14; Sarah C. Richardson, *The Changing Political Landscape of Hydropower Project Relicensing*, 25 WM. & MARY ENVTL. L. & POL’Y REV. 499 (2000); A. Dan Tarlock, *Hydro Law and the Future of Hydroelectric Power Generation in the United States*, 65 VAND. L. REV. 1723 (2012).

projects were up for relicensing between 1993 and 2010.³⁰⁴ Second, relicensing proceedings offer limited opportunities for public participation. Relicensing involves a lengthy and highly complex trial-type proceeding that is geared toward the license holder, and although other entities may be allowed to intervene if they can show a direct interest in the outcome, the nature of the process requires a major commitment of time and resources.³⁰⁵ Third, FERC relicensing has been controversial, both because of the potential cost of new license conditions and the time and expense of the review process. Congress took steps to address key industry concerns in 2005,³⁰⁶ and the issue was again the subject of pro-industry legislation in the 114th Congress.³⁰⁷

The relicensing process has resulted in a few celebrated dam removals,³⁰⁸ but in most cases the results only go so far in undoing the damage done by hydropower development. Still, relicensing represents an opportunity to restore some semblance of balance; in the words of Adell Amos, “values associated with our rivers, distinct from the river’s ability to generate hydropower, can enter the evaluative process. Now, this is not to say that the pressure to produce hydropower is easy to overcome. Rather, I suggest that this framework at least admits other considerations.”³⁰⁹ And in some cases, the process has resulted in license revisions that have reduced the environmental impacts of project operations, sometimes dramatically so.³¹⁰

304. Amos, *supra* note 300, at 7 (citing government documents).

305. *Id.* at 4–9 (describing the relicensing process generally); *id.* at 10–16 (describing changes to the process made by the 2005 Energy Policy Act). The “interest which may be directly affected by the outcome” standard for intervention appears in FERC’s rules at 18 C.F.R. § 385.214 (2017).

306. See Amos, *supra* note 300, at 9–26 (explaining changes made by the 2005 Energy Policy Act, and the underlying concerns that prompted them).

307. S. 1236, 114th Cong. (2015). The bill seeks to boost hydropower production by, among other things, restricting the authority of other federal agencies to impose protective license conditions under section 4(e) and section 18 of the Federal Power Act (addressed in sections 5 and 9 of the bill, respectively).

308. See Owen & Apse, *supra* note 302, at 1073–80 (dams on the Kennebec and Penobscot Rivers in the Northeast); Adell L. Amos, *Dam Removal and Hydropower Production in the United States—Ushering In a New Era*, 29 J. ENVTL. L. & LITIG. 1, 17–20 (dams on the Elwha, Sandy, and White Salmon Rivers in the Northwest).

309. Amos, *supra* note 308, at 16.

310. Owen & Apse, *supra* note 302, at 1064. For a detailed example of how the relicensing process led to improved environmental flow conditions in one river basin, see LOCKE ET AL., *supra* note 17, at 91–123 (summarizing the process and results of the relicensing of a hydropower project on the Housatonic River, Connecticut).

C. Potential Significance for Review of Corps and Bureau Project Operations

Federal lands law has long required management plans be regularly revised, and the Federal Power Act has provided for relicensing of hydropower projects for nearly a century.³¹¹ Congress has established no similar process for federal water projects, however, raising a question of whether requirements that make sense for the Forest Service or FERC somehow do not for the Corps or the Bureau. While there are certainly differences, especially between federal land management and federal dam operations, there is no obvious policy reason for the dam operating agencies not to conduct periodic reviews.

One potential argument against periodic reviews for federal water projects relates to their authorizing statutes, which specify the purpose(s) served by each project. Without further congressional action to change the purposes of a project, why revisit an operating regime that was designed to serve that project's established purposes? The answer is based on the rationale for FERC relicensing, which does not change the purpose of existing hydropower projects, but can and does impose new conditions on the way projects operate for that purpose. Those new conditions may greatly impair the value of a project for hydropower, but courts have upheld such conditions based on key provisions of the Federal Power Act intended to protect natural resources. Unlike FERC, the Bureau and the Corps are not required to give "equal consideration" to the needs of fish, wildlife, recreation, and the environment in determining project operations.³¹² To the contrary, the Corps and Bureau are prohibited from making "major" operational changes to their projects without congressional approval,³¹³ but they may still make operational changes so long as they do not conflict with authorized project purposes.³¹⁴ At Glen

311. The original Federal Power Act of 1920, Act of June 10, 1920, ch. 285, 41 Stat. 1063, provided for hydropower project licenses to be issued for no more than fifty years, *id.* § 6, 41 Stat. at 1067, allowed the federal government to take over a project at the expiration of its license, *id.* § 14, 41 Stat. at 1071, and provided for relicensing of those projects not taken over by the government when their licenses expired, *id.* § 15, 41 Stat. at 1072.

312. 16 U.S.C. § 797(e) (2012).

313. 43 U.S.C. § 390b (2012); *see supra* notes 81–83 and accompanying text.

314. For example, the Corps' new rule on this subject states, "Within existing authority, operations may be adjusted to better address new or existing authorized purposes." Water Control Management Rule, *supra* note 162, ¶ 2-3(b). The rule also provides, "Project

Canyon Dam, for example, the Bureau made meaningful changes to operating practices in the 1990s despite legal mandates regarding water supply and hydropower generation;³¹⁵ the agency understood that the changes would reduce hydropower revenues to some extent, but would benefit downstream resources.³¹⁶

One might question the relevance of federal lands planning in this context, given that land management and dam operations require different types of plans. Federal lands plans serve much like zoning documents, mapping sectors of the planning area where certain activities will be allowed, restricted in specified ways, or prohibited;³¹⁷ water project operating plans rely more on graphs, focusing primarily on reservoir levels and the timing and volume of releases for various purposes. Land management plans must deal with diverse landscapes across a broad planning area; dam operations plans must address varying water year types that may occur over the life of the plan. While the particulars differ, however, the two types of plan should ultimately serve very similar purposes. Both provide a long-term policy framework that directs the agency in making important decisions about on-the-ground activities or short-term operations. And most fundamentally, each type of plan should represent the agency's best effort to address the needs of varying—and potentially conflicting—uses, consistent with the purposes for which the resource must be managed.

Another potential objection to revisiting federal water project operations is that it would not be fair to make changes that could harm established beneficiaries of these projects; in other words, because some people rely on established operations, the agencies should maintain the status quo.³¹⁸ While the fairness of changing

operations in support of enhanced ecosystem sustainability are encouraged when compatible with other project purposes." *Id.* ¶ 2-2(e).

315. See U.S. DEP'T OF THE INTERIOR, OPERATION OF GLEN CANYON DAM FINAL ENVIRONMENTAL IMPACT STATEMENT, at 1-2, 8-10 (1995) (explaining the legal requirements and restrictions on Glen Canyon Dam operations).

316. U.S. DEP'T OF THE INTERIOR, RECORD OF DECISION—OPERATION OF GLEN CANYON DAM FINAL ENVIRONMENTAL IMPACT STATEMENT, at 11 (1996).

317. See RASBAND ET AL., *supra* note 219, at 289 (quoting a 1997 conference paper by Scott W. Hardt).

318. Existing beneficiaries get limited legal protection in an analogous context: livestock grazing on federal lands. See *Pub. Lands Council v. Babbitt*, 529 U.S. 728, 740-44 (2000) (rejecting grazing industry arguments against Interior Department rules on livestock grazing). The Court observed that even the ranchers' favored system of determining livestock numbers on particular grazing allotments "did not offer them anything like

dam operations may be debatable in the abstract, the debate would be far more meaningful in the context of specific changes at a specific project, made for specific reasons and affecting specific beneficiaries. As to water projects generally, however, two points appear from existing law. First, federal water projects must continue to serve their authorized purposes unless and until Congress acts to change those purposes or approve major changes, ensuring that a new operating plan can only go so far in altering the benefits of a project. Second, federal law does allow for major changes to the operating conditions of one type of dam: hydropower projects regulated by FERC. These projects not only have clear beneficiaries, they have non-federal licensees who could lose significant money as a result of new conditions, imposed through relicensing to protect the public interest. It is remarkable that Congress has maintained this requirement for private hydropower projects for nearly a century, but has never established any such program for dams built and operated by the U.S. government.

The argument for such reviews is stronger than ever because of one factor: climate change. The various impacts of climate change will continue to make water management increasingly complicated and challenging, especially in the West.³¹⁹ Climate change is a particularly compelling factor in the project operations context, because it effectively shifts the basic hydrologic assumptions on which existing operations are grounded. As stated in a U.S. Geological Survey report:

One adaptation to climate change is to make better use of existing water resources by building more flexibility into operating plans. Existing operating plans are based on the historical climate. For example, flood-control rules are based on evaluations of historical flood risk, which have a climate context There may be benefits from revising reservoir storage rules and authorized purposes as climate changes. Changes in climate or other aspects of basin hydrology, as well as changes in social values, may result in new uses

absolute security” regarding the number of animals they would be allowed to graze. *Id.* at 742.

319. See BREKKE ET AL., *supra* note 22, at 5–7. This report, prepared with the participation of the Bureau and the Corps as well as the U.S. Geological Survey, notes that the agencies began working on it because of “the rate at which observed climate variability impacts have affected water resources projects, particularly in the West, and the potential for significant future changes.” *Id.* at 5.

for reservoir storage that have a greater economic or social value than the current uses. Flood storage space could be evaluated based on updated hydrologic records and future projections. Some projects may be operated more efficiently as part of an integrated system rather than as independent projects.³²⁰

As this passage suggests, climate is certainly one of the water-related changes that argues for revisiting reservoir operations, but it is not the only one. As noted in that same report, “[e]ffective management of our existing water resources infrastructure depends on adaptation to current realities—realities of the physical infrastructure, the competing demands for water, public values, and climate. None of these are static.”³²¹

What are the Bureau and the Corps—along with the courts and Congress—doing to ensure that project operating plans reflect these “realities,” and what more could be done to ensure that such plans stay current? The next Part addresses these questions, beginning with the agencies themselves.

VI. WHAT IS BEING DONE, AND CAN BE DONE, TO PROMOTE OPERATING PLAN REVIEWS

This Article has emphasized the lack of movement by the Corps and the Bureau on reviewing their project operating plans, and the absence of a statutory framework requiring them to undertake such reviews. While the agencies and others have taken small positive steps in recent years, there is much more they could do to advance the cause of optimizing operations of federal water projects. This Part briefly identifies what key players—especially the agencies and Congress—have already done, as well as the work that remains to be done.

A. Actions by the Corps

The Corps took a significant step forward in 2015 when it made commitments regarding implementation of environmental flows at its existing projects.³²² The Corps was responding to a letter from

³²⁰. *Id.* at 29.

³²¹. *Id.* at 8.

³²². Letter from Thomas P. Bostick, Lieutenant Gen., Commanding, U.S. Army Corps of Eng'rs, to Dr. Rollin E. Hotchkiss, Chair, Chief of Eng'rs Evt'l Advisory Bd. (Nov. 30, 2015).

its Environmental Advisory Board³²³ recommending that the Corps “initiate environmental flows from as many of its dams as possible,”³²⁴ and urging the Corps to take specified actions toward this end.³²⁵ The tone of the Corps’ response is remarkably positive,³²⁶ and the substance is reasonably detailed in identifying steps the Corps may take in carrying out the recommendations, although it clearly suggests that success in delivering environmental flows will require cooperation and commitment from many different Corps offices.

The Corps is taking further steps that could eventually translate into improved operations from the standpoint of drought response and water supply. It is developing a strategy for revising its drought contingency plans,³²⁷ which were last systematically produced in the 1980s and 1990s.³²⁸ The Corps is proceeding with drought contingency plan updates at five high-priority pilot projects, and is also developing a longer list of priority projects for this purpose.³²⁹ On a related issue, “the Corps is studying the use of forecasting tools to determine whether water control manuals can be adjusted

323. Letter from William L. Graf, Chair, Chief of Eng’rs Env’tl Advisory Bd., to Lieutenant Gen., Commanding, U.S. Army Corps of Eng’rs (Apr. 24, 2014).

324. “Environmental flows (E-flows) are releases from dams and their reservoirs to create downstream river flows that create the conditions needed to sustain fresh water ecosystems.” *Id.*

325. One of these recommended actions was for Corps district commanders to identify opportunities to implement environmental flows at particular projects, “as part of each 5-year review of their Water Operations Manuals.” *Id.*

326. The opening two paragraphs are rather remarkable, coming from the Corps’ commanding officer:

[T]he Corps is increasingly being asked to assess how the Nation’s rivers and waters might be managed differently to provide more environmental benefits, while concurrently providing for navigation, flood risk management, hydropower, recreation, and water supply. Further, the Corps is under pressure to complete work with shorter schedules and less funding, and when our largest and most expensive environmental efforts are driven by litigation and endangered species.

It is precisely at these times that we need to aggressively and proactively pursue ideas like implementation of environmental flows, which have high environmental potential for relatively low costs.

Letter from Thomas P. Bostick to Dr. Rollin E. Hotchkiss, *supra* note 322.

327. As noted above, the water control manual for a project is to include a drought contingency plan. *See supra* notes 175–178 and accompanying text.

328. U.S. GOV’T ACCOUNTABILITY OFFICE, *supra* note 256, at 18.

329. *Id.* at 19.

to improve water-supply and flood-control operations at two projects in California—Folsom Dam and Lake Mendocino.”³³⁰

The Corps already has been directed by Congress to produce “a plan for reviewing the operations of individual projects, including a detailed schedule for future reviews of project operations.”³³¹ The 2014 Water Resources Reform and Development Act (“WRRDA”) mandated this report in a section titled “Reservoir Operations and Water Supply,” which required the Corps to take further steps to consider potential operational changes, particularly at projects in arid regions where “flexibility” might help mitigate the water supply impacts of drought.³³² The report on reviews of project operations was due in June 2016,³³³ although it is not clear when (or even if) it might be forthcoming.³³⁴ If the Corps does indeed produce a realistic schedule for reviewing the operations of its projects, it would arguably put the onus on Congress to provide sufficient funding to complete them as scheduled.³³⁵

The Corps could take another positive step by ramping up implementation of its newly revised rules on water control plans. As discussed above,³³⁶ these rules already provide for periodic review of water control plans, updating them in response to changing conditions and policies, and involving the public in the process. These reviews to date have been left to the discretion of Corps district officials, however, whose requests for the necessary

330. *Id.* The question, according to the Corps, is whether the forecasts can be improved to be sufficiently accurate at the project level for purposes of making decisions about water supply and flood control operations. *Id.* at 19–20.

331. This plan is only one part of a larger report that must also include, among other things, information about prior operations reviews at existing projects. Water Resources Reform and Development Act of 2014, Pub. L. No. 113-121, § 1046(a)(2)(B)(ii), 128 Stat. 1193, 1252.

332. *Id.* § 1046(a)(2)(A), 128 Stat. at 1251.

333. The WRRDA was signed into law on June 10, 2014, and it requires the Corps to produce the report no later than two years from the date of enactment. *Id.* § 1046(a)(2)(B)(i), 128 Stat. at 1252.

334. A GAO report on the Corps’ policies and practices regarding water control manual updates, issued in July 2016, stated simply that “the Corps did not [produce] the report as required by the statutory deadline because of funding constraints.” U.S. GOV’T ACCOUNTABILITY OFFICE, *supra* note 256, at 3.

335. Given the annual disputes over the Corps’ budget and appropriations, it is questionable whether Congress would prioritize funding for operations reviews over other activities, especially new projects. *See generally* Annie Snider, *After Major Congressional Action, Little Change at Army Corps*, GREENWIRE (Feb. 20, 2015), <http://www.eenews.net/stories/1060013767> [<https://perma.cc/7QR4-NLSQ>].

336. *See supra* notes 179–183 and accompanying text.

funding have not always been approved.³³⁷ Corps headquarters could strengthen implementation by supporting such reviews and providing the money needed to conduct them, challenging as that may be in the current fiscal climate.

B. Actions by the Bureau

The Bureau made a positive move of its own in 2014, launching a Reservoir Operations Pilot Initiative. Through this program, the Bureau will assess climate change impacts on reservoir operations, and ways that operational flexibility can assist with climate adaptation.³³⁸ Through pilot studies involving one river system in each of the agency's five regions,³³⁹ the Bureau will seek to identify beneficial flexibility in reservoir operations by making better use of information about weather, hydrology, and climate change. These pilot studies will help the Bureau "develop Reclamation guidance on how to identify and implement improvements to reservoir operations by considering improved scientific information."³⁴⁰ This description suggests that the initiative deals only with technical aspects of operations decision-making, but the Bureau intends to address a broader range of issues in the guidance, including potential changes in project operations—both minor changes using the existing flexibility in current operating plans, and greater changes that may trigger the need for environmental reviews.³⁴¹

This initiative is a step toward producing climate change "adaptation strategies," which the Bureau has been reluctant to do despite the SECURE Water Act's direction to develop them.³⁴² The statute specifically mentions the development of new operating

337. *See supra* notes 201–203 and accompanying text.

338. U.S. BUREAU OF RECLAMATION, SECURE WATER ACT SECTION 9503(C)—RECLAMATION CLIMATE CHANGE AND WATER 2016, at 1-31 (2016).

339. These pilot studies (and their respective regions) are the upper Colorado River Basin (Upper Colorado), the Crooked River Basin (Pacific Northwest), the Klamath River Basin (Mid-Pacific), the Salt River Basin (Lower Colorado), and the upper Washita River Basin (Great Plains). The Bureau says it will carry out these studies in 2016 and 2017. *Reservoir Operations Pilot Initiative*, RECLAMATION (2016) <http://www.usbr.gov/watersmart/wcra/reservoirpilot.html> [<https://perma.cc/S7SS-GKQY>] (last updated Jan. 13, 2017).

340. *Id.*

341. Telephone Interview with Katharine Dahm, Water Res. & Planning Div., U.S. Bureau of Reclamation (Aug. 12, 2016). Ms. Dahm, who is leading the Reservoir Operations Pilot Initiative, said that the Bureau has begun working on the guidance and should issue it in 2018.

342. *See supra* notes 195–200 and accompanying text.

plan as one strategy,³⁴³ and it seems one of the more feasible and effective ones for an agency that operates numerous reservoirs. Indeed, increasing water management flexibility is the first goal of the Bureau's *Climate Change Adaptation Strategy*,³⁴⁴ and one of the key means to this end is to "[i]dentify opportunities to adapt reservoir operations to improve flexibility."³⁴⁵ The Reservoir Operations Pilot Initiative is thus a key element of the Bureau's climate adaptation efforts,³⁴⁶ but for now it is a pilot program that will be used to inform new guidance, and seems primarily focused on the use of certain kinds of tools and information in operations decision-making. This new initiative may ultimately translate into the adoption of project-specific adaptation strategies in the form of revised operating plans, but much will depend on the timing and content—and especially the implementation—of the resulting guidance.

Another key question is whether the forthcoming guidance will focus primarily on technical aspects of operations decision-making, such as data and modeling, or whether it will seriously address broader questions about potential changes in operations.³⁴⁷ There is certainly great value to incorporating the best science and decision-support tools, as these inputs should allow the Bureau to make operating decisions that are more technically sound, and potentially more flexible and adaptable in handling changing weather and climate. But if the agency is not considering changes with environmental or recreational benefits, evaluating a range of alternatives, and providing public involvement, its reviews may well ignore the public's top concerns and priorities regarding a project's operations.

343. 42 U.S.C. § 10363(b)(4) (2012).

344. U.S. BUREAU OF RECLAMATION, *supra* note 199, at 14.

345. *Id.*

346. Given the Trump administration's position on climate change, the future of the Bureau's climate change adaptation efforts is in doubt. See Brittany Patterson, *Zinke to Review Agency's Climate Goals*, CLIMATEWIRE (Mar. 30, 2017), <https://www.eenews.net/climatewire/2017/03/30/stories/1060052337> [<https://perma.cc/CF8Y-PNRF>] (describing review of policy and planning documents within the Interior Department).

347. When the Bureau provided an update on the Reservoir Operations Pilot Initiative in late 2016, its explanation focused entirely on technical issues and gave no indication that the effort would address broader considerations regarding project operations. U.S. BUREAU OF RECLAMATION, CLIMATE CHANGE ADAPTATION STRATEGY: 2016 PROGRESS REPORT, at 4, 6, 10–11 (2016).

The Bureau should develop a policy framework for operating plan reviews that goes beyond the technical—one that provides for both involving the public and addressing the issues of public concern. Developing the policy would surely be controversial, and would require the Bureau to work closely with multiple interests—especially water users, hydropower interests, and the western states, all of whom seem likely to have serious concerns with the idea of reviewing project operating plans. The Bureau might consider some type of structured process for stakeholder engagement in developing the policy, along the lines of that used for negotiated rulemaking³⁴⁸ (although the resulting policy seems more likely to be guidance than rule).

Implementing any resulting policy would be an even more ambitious challenge for the Bureau, one that would certainly require significant agency resources over a period of several years. Success in implementation may depend on whether the policy lays out an approach that will allow most reviews to address the key issues and public concerns without a lengthy, contentious, and expensive NEPA process that ends in litigation. While there are no sure or easy answers to this challenge, there may be a useful model in British Columbia's mostly-successful process for reviewing the operations of hydropower projects owned by the major provincial utility, BC Hydro.³⁴⁹ The right kind of process might require intensive engagement by stakeholders and agency personnel for many months, but could pave the way for a lighter NEPA review

348. See Negotiated Rulemaking Act, 5 U.S.C. §§ 561–66 (2012) (describing how negotiated rulemaking committees are formed, how interests and individuals are selected, and how the committee works to develop a proposed rule).

349. This “water use planning” process reached consensus in developing recommendations for operations and other changes at all but one of twenty-three projects (or project systems) reviewed. To simplify greatly, the process involved intensive stakeholder engagement through teams representing various interests in the area affected by the project, and consideration of various operational changes through the use of modeling runs and other analytical tools. The process also provided for public involvement, and the resulting recommendations were subject to final review and a decision by the relevant department of the British Columbia provincial government. JAMES MATTISON ET AL., WWF CANADA, WATER FOR POWER, WATER FOR NATURE: THE STORY OF BC HYDRO'S WATER USE PLANNING PROGRAM (2014). A change in approach by BC Hydro succeeded in steering the disputes out of litigation and into a process that eventually reached consensus regarding the great majority of projects. “Previously the water management planning process had been confrontational and acrimonious; the new plan turned it into one of the most successful in Canada.” LOCKE ET AL., *supra* note 17, at 9 (explaining, in chapter 2, both the water use planning process generally and its successful application in the Campbell River system of Vancouver Island).

and an operating plan that the major players could support. The Bureau may also be able to build on the foundation provided by the “basin studies”³⁵⁰ it has helped develop through the WaterSMART program under the SECURE Water Act.³⁵¹

C. Actions by the Courts

The federal courts play a secondary but significant role in this issue, largely because of the way they have interpreted NEPA’s application to regular operations of federal water projects.³⁵² Here again, the Ninth Circuit Court of Appeals in 2014 took a potentially positive step by requiring the Bureau to prepare an Environmental Impact Statement before selecting and implementing an RPA for operating a project in compliance with the ESA.³⁵³ The court agreed with water users who argued that an EIS was needed before the Bureau could decide how it would meet its duty to avoid jeopardy to listed species in operating the Central Valley Project.³⁵⁴ The court noted the potentially significant environmental impacts

350. See Reed D. Benson, *Federal Water Law and the “Double Whammy”: How the Bureau of Reclamation Can Help the West Adapt to Drought and Climate Change*, 39 *ECOLOGY L.Q.* 1049, 1064–67 (2012) (summarizing the basin study program generally and identifying early basin studies). The basin study program has continued to expand in recent years, as more studies have been completed and the Bureau has continued to sponsor new ones. U.S. BUREAU OF RECLAMATION, *supra* note 338, at 1-43–1-46 (describing the progress of basin studies and including a table identifying all studies to date).

351. One of the most recent basin studies, for the very important and highly stressed Sacramento-San Joaquin River Basins of California, illustrates how a basin study may help lay the groundwork for changes in project operations. U.S. BUREAU OF RECLAMATION, SACRAMENTO AND SAN JOAQUIN RIVERS BASIN STUDY (2016). The study assesses the impacts of climate change on several water-related categories in the basin, ranging from water supply, hydropower, and flood control to water quality, recreation, and fish habitat. It then identifies several potential “adaptation portfolios” and assesses their performance in each category under three different climate scenarios. *Id.* at ES-1–ES-7. The report’s conclusion states that

earlier runoff due to warming conditions will impact reservoir operations in several important ways. Earlier runoff will fill reservoirs earlier, which may force earlier discharge due to the flood rule curves in effect for each reservoir. Implementing adaptive flood rule curves could provide for increased flexibility under future conditions.

Id. at 115. As a potential next step, the report suggests, “Work cooperatively with the Army Corps of Engineers to evaluate allowing adaptive management of flood rule curves for reservoirs. . . . [R]eservoir management using adaptive flood rule curves could potentially provide for increased annual and multi-year carry-over storage.” *Id.* at 118.

352. See *supra* notes 155–161 and accompanying text.

353. See *supra* notes 127–140 and accompanying text (explaining ESA requirements regarding project operations).

354. *San Luis & Delta-Mendota Water Auth. v. Jewell*, 747 F.3d 581 (2014).

of the decision, and rejected environmentalists' argument that requiring the Bureau to comply with NEPA in this context would conflict with the goal of the ESA.³⁵⁵ While this application of NEPA is ironic at best, and harmful to listed species at worst,³⁵⁶ the Ninth Circuit's basic rationale—that NEPA should apply “to the fullest extent possible” to agency actions with potentially significant impacts, absent a statutory exemption³⁵⁷—could be used to argue for environmental reviews of regular Bureau and Corps operations.³⁵⁸

The Ninth Circuit needs to take the next logical step, and revisit its interpretation of NEPA that has allowed the agencies to operate their projects with no environmental review or consideration of alternatives. That interpretation has stood since the court announced it in the *Upper Snake* case more than twenty-five years ago,³⁵⁹ and recent decisions suggest that the court sees no problem with it.³⁶⁰ But the *Upper Snake* rule does have two significant problems. First, it is arguably contrary to NEPA's text, implementing rules, and other relevant case law. I made this argument some years ago,³⁶¹ and the Ninth Circuit's 2014 decision

355. *Id.* at 646–55. The court stated that it was “cognizant of our commitment to avoid ‘making NEPA making more of an “obstructionist tactic” to prevent environmental protection than it may have already become,’” *id.* at 655, but held that neither the statute nor the cases provided any reason not to require NEPA compliance by an agency deciding how it would meet its duty of avoiding jeopardy to listed species under section 7 of the ESA.

356. The irony, as I argued in an earlier article, is that the courts have refused to require NEPA compliance for the Bureau's routine project operations, regardless of their environmental harm, and instead would trigger NEPA only when the Bureau was making decisions about how to *reduce* harm to listed species. Benson, *supra* note 72, at 321–27.

357. *San Luis*, 747 F.3d at 647. The court quoted the statutory text for the phrase “to the fullest extent possible.” See 42 U.S.C. § 4332(2)(C) (2012).

358. Following Ninth Circuit precedent, a district court required federal agencies to prepare an EIS regarding their ESA compliance for the Federal Columbia River Power System, where a key focus is operation of Corps projects on the Columbia and Snake Rivers. *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 184 F. Supp. 3d 861 (D. Or. 2016).

359. *Upper Snake River Chapter of Trout Unlimited v. Hodel*, 921 F.2d 232, 236 (9th Cir. 1990).

360. In the case on the Bureau's ESA efforts, the court cited but distinguished *Upper Snake*, noting that by selecting and implementing a RPA the Bureau would be making a change and not simply maintaining the operational status quo. *San Luis*, 747 F.3d at 646. More recently, the Ninth Circuit held that no EIS was needed when the Corps reverted to an earlier operating practice at a reservoir in Idaho; even though the Corps was abandoning the winter operations it had used for over a decade, the court managed to find that the agency was maintaining the status quo. *Idaho Conservation League v. Bonneville Power Admin.*, 826 F.3d 1173 (9th Cir. 2016).

361. Benson, *supra* note 72, at 296–301.

calls it further into question. Second, it gives the agencies a strong perverse incentive to avoid considering any meaningful change, thus perpetuating environmental harms caused by established operations. It is hard to imagine a result more contrary to the spirit of NEPA.

If the courts do revisit the application of NEPA to federal water project operations, injunctive relief will be a key issue. In the *Upper Snake* case itself, plaintiffs sought to keep the Bureau from cutting reservoir releases during drought; the court recognized the likely harm to downstream fish from lower flows, but was reluctant to interfere with the Bureau's operating choices in a time of shortage.³⁶² Since that decision, however, the Supreme Court has made it clear that courts must not automatically enjoin an agency action taken in violation of NEPA, but must instead apply a four-factor test to determine if injunctive relief is appropriate.³⁶³ Courts are understandably reluctant to issue an order that might impede Corps or Bureau operations of a reservoir, especially under difficult circumstances. But a court can, and ordinarily probably should, allow continued operations under an existing plan while ordering the agency to conduct an environmental review of its operating plan for future years.³⁶⁴

D. Actions by Congress

For its part, Congress in 2016 gave the Corps new authority regarding changes in operating plans for the benefit of water supply.³⁶⁵ In states where a drought emergency exists, the Corps may now evaluate "water supply conservation measures that are consistent with the authorized purposes" of its projects, including storage and releases for water supply purposes.³⁶⁶ If requested by the governor of a state where a drought emergency exists, the

362. *Upper Snake*, 921 F.2d at 234–36 (concluding that flow rate changes constituted routine activity, not a major federal action requiring an EIS under NEPA).

363. *Winter v. Nat. Res. Def. Council*, 555 U.S. 7, 23–24 (2008); *Monsanto Co. v. Geertson Seed Farms*, 561 U.S. 139, 156–58 (2010).

364. The district court in the *Upper Snake* litigation believed that an injunction regarding the Bureau's operations of the dam was not warranted, but also thought that an EIS on its operations "would be helpful" to the Bureau. *Upper Snake River Chapter of Trout Unlimited v. Hodel*, 706 F. Supp. 737, 740–42 (D. Idaho 1989).

365. Water Infrastructure Improvements Act for the Nation, Pub. L. No. 114-322, 130 Stat. 1628 (2016).

366. *Id.* § 116.

Corps may also “prioritize the updating of the water control manuals” for its facilities in that state, and revise those manuals to provide for water supply operations.³⁶⁷ More generally, the Corps may now consider proposals from “non-Federal interests[s] . . . to increase the quantity of available supplies of water” from Corps projects, including proposals to change operations or to allocate water from the project.³⁶⁸ It is too soon to tell how the Corps might utilize these new water-supply authorities, all of which specifically preserve existing project purposes.³⁶⁹

Congress earlier made a constructive move in the 2014 WRRDA,³⁷⁰ requiring the Corps to produce a report regarding its activities in revising water control manuals.³⁷¹ The report must not only address the Corps’ prior reviews of water control manuals and any ensuing actions to improve project operations,³⁷² but also provide a detailed and prioritized schedule for future reviews and follow-up actions.³⁷³ The WRRDA also called for a GAO study of the Corps’ efforts regarding water control manual revisions;³⁷⁴ the GAO report, issued in July 2016, noted that the Corps had not produced its required report by the statutory deadline.³⁷⁵ The study also identified some movement by the Corps regarding operations planning, including pilot efforts to update drought contingency plans at five high-priority projects, which would “help

367. *Id.* § 117(a).

368. More specifically, these proposals may involve “(1) modification of the project; (2) modification of how the project is managed; or (3) accessing water released from the project.” *Id.* § 118(a). In general, non-federal entities are required to bear the full costs of these proposals. *Id.* § 118(h)(1).

369. *Id.* §§ 116(c)(1), 117(c), 118(g)(2). Each section contains additional restrictions on how its authorities may be used.

370. Water Resources Reform and Development Act of 2014, Pub. L. No. 113-121, 128 Stat. 1193.

371. Section 1046 of the WRRDA referred to the newly required report as an update of a 1992 Corps report, “Authorized and Operating Purposes of Corps of Engineers Reservoirs.” *Id.* § 1046(a)(2)(B)(i), 128 Stat. at 1252.

372. More specifically, section 1046 requires the report to identify the date of the last revision of each project’s water control manual, any significant recommendations resulting from that review, and “the activities carried out pursuant to each such review to improve the efficiency of operations and maintenance and to improve project benefits consistent with authorized purposes.” *Id.* § 1046(a)(2)(B)(ii)(aa)–(bb), 128 Stat. at 1252.

373. *Id.* § 1046(a)(2)(B)(ii)(dd), 128 Stat. at 1252. The plan is to prioritize reviews and activities where the Corps determines there is support for them; it must also ensure, somehow, that the reviews and activities actually get done as planned.

374. *Id.* § 1046(a)(3), 128 Stat. at 1252.

375. U.S. GOV’T ACCOUNTABILITY OFFICE, *supra* note 256, at 3.

the agency develop a framework for a systematic update of drought contingency plans.”³⁷⁶ The report also highlighted shortcomings in the Corps’ policies and practices regarding manual updates, and explained some of the reasons—including funding constraints—why significant revisions were not regularly undertaken.³⁷⁷

In the realm of oversight, Congress can take additional steps to promote review and revision of project operating plans. First, it can continue tracking the Corps’ policies and practices, informed by the findings of the 2016 GAO report on this issue. Second, Congress can begin showing similar interest in the Bureau’s policies and practices regarding operating plan reviews.³⁷⁸ As an initial step, members of Congress could request a GAO study focusing on the Bureau, parallel to the one recently completed on the Corps.

Congress could take a further step by using the appropriations process to provide funding specifically for operating plan reviews. The 2016 GAO study, in examining the reasons why the Corps does not make a practice of reviewing and updating water control manuals, repeatedly identifies funding and resource constraints as a key factor.³⁷⁹ The study indicates that Corps officials see the potential value and importance of updating their manuals, but given the agency’s limited budget, reviews are simply not a high enough priority.³⁸⁰ The Corps may believe that they are not really a priority on Capitol Hill, either,³⁸¹ but Congress could show

376. *Id.* at 18–19.

377. *Id.* at 11–18.

378. Congress has focused primarily on the Corps in this regard, but has recently shown some limited interest on the Bureau side. A Senate bill, S. 2902 (sponsored by Senator Flake of Arizona and other Republicans), opens with a section on “Reservoir Operation Improvement,” but it deals exclusively with Corps projects. Bureau projects are specifically excluded from the bill’s provisions on operating plan reviews; a Bureau project can opt in, but only if all the non-federal beneficiaries of the project specifically request it in writing. S. 2902, 114th Cong. § 101 (2016).

379. To provide just one example from the report, “[D]istrict officials we interviewed told us they have identified certain manuals needing revision, but they have not received the O&M funds they requested to revise these manuals.” U.S. GOV’T ACCOUNTABILITY OFFICE, *supra* note 256, at 16.

380. “[R]evisions to water control manuals are often a lower priority than other O&M activities, such as equipment repairs, sediment removal, or levee repairs. As a result, districts may not get funding to revise water control manuals.” *Id.* at 17.

381. The Corps’ failure to meet the statutory deadline for the report required by the 2014 WRRDA may suggest that the Corps does not believe that water control manual revisions generally are a high priority for Congress.

otherwise by directing funds for the purpose of carrying out at least a few reviews.

Ideally, Congress would take the next step, and establish a statutory framework for project operating plan reviews for the Bureau and/or the Corps. By doing so Congress could address key policy questions such as the timeframe for reviews; the need for public participation; any special requirements for NEPA reviews; the role of state governments and state water laws in the process; and the extent to which existing project purposes and beneficiaries could prevent or limit changes to established operations. Ideally, Congress could deliver the kind of legal framework for federal dam operators that it has for federal land managers,³⁸² providing the Corps and the Bureau with the type of direction for water projects that it gave other agencies for national forests and wildlife refuges. Such a new law seems unlikely for now, given recent difficulties in enacting major federal legislation, but at some point Congress should seriously consider replacing the patchwork of federal water project authorities with a unified modern statute for the Corps,³⁸³ and another for the Bureau.³⁸⁴

In sum, recent events suggest a growing recognition of the potential benefits to reviewing the operations of federal water projects. The Corps and the Bureau especially have taken some modest steps in the right direction, but the agencies and Congress need to do much more to ensure that these reviews actually proceed in the near future. The conclusion offers some final observations about why they should do so.

VII. CONCLUSION

Congress authorized federal water projects for particular purposes, and the Corps and the Bureau operate them to serve those purposes. While those purposes still have value today, most of these projects were built several decades ago, and much has changed since then. Climate is only one of several key factors that

382. See *supra* Section V.A.

383. See Tarlock, *supra* note 3, at 1320 (calling on Congress to “give the Corps organic legislation, which would put the agency’s new missions on a firmer legal footing than they enjoy today”).

384. I made this case in an earlier article, focusing primarily on the “unfinished environmental business” of the Bureau’s authority to carry out environmental restoration. Benson, *supra* note 13, at 178–84.

will continue to change, placing growing pressure on water resources and water managers, particularly in the West. If the Corps and the Bureau do not establish and implement programs to review their operating plans, they will face a growing risk that yesterday's projects will fail to meet tomorrow's needs.

Federal water projects may play an especially crucial role in helping the West adapt to its dramatic changes, because the region's water allocation and management regime is simply not built for flexibility. The early West prioritized "putting water to work" for industry, irrigation, and other economic uses, and today the region's water law still reflects that focus on development. Water rights last forever, with little or no legal scrutiny applied to established uses; in times of shortage, the oldest uses have a right to take their full share before later users have a right to any water at all; and the system still struggles to accommodate important "new" uses such as water for recreation and the environment.³⁸⁵ As the western states' water law reform efforts have lagged, federal initiatives have become increasingly important,³⁸⁶ and federal reservoir operations are one area that may offer a measure of needed flexibility in water management.

Maintaining current operating plans may be the path of least resistance in the short term, and it is easy to understand why the agencies are reluctant to undertake reviews given the potential cost, controversy, and litigation risk. The record shows, however, that for many years dam operations have been the focus of controversy and costly litigation, with most (though certainly not all) of that litigation arising under the ESA.³⁸⁷ Maintaining the operational status quo nearly guarantees that endangered species listings and litigation will remain the go-to tactics for those who seek to address environmental problems associated with federal water projects. A more open and inclusive process for addressing environmental concerns could make the ESA less crucial, allowing the agencies to break away from reactive water management driven by a single

385. See Reed D. Benson, *Public on Paper: The Failure of Law to Protect Public Water Uses in the Western United States*, INT'L J. RURAL L. & POL'Y, 2011 Special Edition, at 1 (examining various features of western water law, and the ways that it has effectively protected private rights and uses at the expense of public values and interests).

386. See David H. Getches, *The Metamorphosis of Western Water Policy: Have Federal Laws and Local Decisions Eclipsed the States' Role?*, 20 STAN. ENVTL. L.J. 3, 69–72 (2001).

387. See *supra* Section II.B.

species,³⁸⁸ and might even result in less controversy and litigation than the current approach.³⁸⁹

In a nation that has always subjected private hydropower projects to periodic review,³⁹⁰ it is especially difficult to justify allowing federal reservoirs to operate under old plans in perpetuity. After all, these are public projects. Congress authorized them, ostensibly to serve the national interest. They were primarily built with public money, and today they are operated by public agencies. In serving the public, those agencies should do more than apply the best science and analytical tools in determining reservoir operations; they should also engage the public, which deserves to have a say in how these projects operate. Only then can the Corps and the Bureau ensure that their projects will adapt to change and serve the public interest.

388. The Corps seemed to recognize this potential when it embraced the concept of implementing environmental flows at more of its projects. *See supra* notes 322–326 and accompanying text.

389. The desire to reduce controversy and litigation over its operations drove BC Hydro to adopt the “water use planning” process mentioned above. *See supra* note 349 and accompanying text. Having faced years of controversy and litigation over its hydropower operations and their resulting impacts, BC Hydro needed to change in the way the problem was being handled. They wanted to get out of court, sit down with the regulatory agencies and public representatives, and resolve the problems. BC Hydro decided to engage the public and find acceptable resolutions to water management conflict in response to society’s emerging values and beliefs. LOCKE ET AL., *supra* note 17, at 12.

390. *See supra* Section V.B (regarding relicensing of such projects by FERC).