



5-1-2024

# The Dam Lesson: How Learning from Hydropower Governance Can Protect Biological Diversity as We Adapt to the Demands of Climate Change

Adam Fetian

Follow this and additional works at: <https://scholarworks.law.ubalt.edu/ublr>



Part of the [Law Commons](#)

---

### Recommended Citation

Fetian, Adam (2024) "The Dam Lesson: How Learning from Hydropower Governance Can Protect Biological Diversity as We Adapt to the Demands of Climate Change," *University of Baltimore Law Review*. Vol. 53: Iss. 2, Article 6.

Available at: <https://scholarworks.law.ubalt.edu/ublr/vol53/iss2/6>

This Article is brought to you for free and open access by ScholarWorks@University of Baltimore School of Law. It has been accepted for inclusion in University of Baltimore Law Review by an authorized editor of ScholarWorks@University of Baltimore School of Law. For more information, please contact [slong@ubalt.edu](mailto:slong@ubalt.edu).

---

---

THE DAM LESSON: HOW LEARNING FROM HYDROPOWER  
GOVERNANCE CAN PROTECT BIOLOGICAL DIVERSITY AS  
WE ADAPT TO THE DEMANDS OF CLIMATE CHANGE

*Adam Fetian\**

I. INTRODUCTION .....	632
II. ECOSYSTEMS AND HYDROPOWER BACKGROUND.....	634
III. FRAGMENTED PROCESS LEAVES BIODIVERSITY IN THE BACKGROUND .....	636
A. Federal Agencies at the Intersection of Hydropower and Biodiversity .....	636
1. FERC & Federal Conservation Statutes .....	638
a. The Wild and Scenic Rivers Act .....	639
b. The Endangered Species Act .....	640
c. The Fish and Wildlife Coordination Act.....	642
2. Federal Agencies Concerned with the Protection of Biological Diversity .....	643
a. The United States Fish and Wildlife Service .....	643
b. The Environmental Protection Agency .....	644
B. State Interest in the Control of the Hydroelectric Power and Biodiversity .....	645
1. Federal-State Relations in Energy Regulation .....	645
2. State Power and Duties in the Regulation of Wildlife ..	647
C. Structural Governance Issues at the Energy– Biodiversity Nexus.....	649
1. Controversies Between Dams and Wildlife .....	650
2. Energy and Wildlife Controversy in Other Contexts ....	655
3. The Through-Line Between These Controversies.....	656
IV. REDESIGNING FERC’S ENERGY–BIODIVERSITY REGULATION.....	657
A. Design Principles for Hydroelectric Energy– Biodiversity Regulation .....	657
B. Redesigning FERC’s Hydroelectric Licensing Process....	660
V. CONCLUSION.....	664

## I. INTRODUCTION

On November 17, 2022, the Federal Energy Regulatory Commission (FERC) “approved a plan . . . to demolish four dams on a California river and open up hundreds of miles of salmon habitat that would be the largest dam removal . . . project in the world when it goes forward.”<sup>1</sup> The Klamath River dams were originally constructed between 1918 and 1962 and provided hydroelectric power to the surrounding area; today, however, these dams provide only two percent of the power generated by the utility.<sup>2</sup> Removal of the Klamath River dams will once again allow Native tribes to rely upon the river’s salmon to support their cultural way of life, and in California, where drought has put immense pressure on the environment, the return of natural flows from the Klamath will aid in the restoration of flood plains and wetlands that help mitigate drought.<sup>3</sup> In discussing the historic decommission project, former FERC Chairman Richard Glick noted that “[s]ome people might ask in this time of great need for zero emissions, ‘[w]hy are we removing the dams?’”<sup>4</sup> However, he responded, “[A] lot of these projects were licensed . . . when there wasn’t as much focus on environmental issues” and “[s]ome of these projects have a significant impact on the environment and a significant impact on [the] fish.”<sup>5</sup>

As former Chairman Glick points out, many hydroelectric dams alter the environment from which they produce power<sup>6</sup> and affect the

---

\* B.A. *Cum Laude*, 2019 University of Baltimore. Adam is a 2024 Juris Doctor candidate at the University of Baltimore School of Law, Vice President of the UBalt Environmental Law Society, and served on Volumes 52 & 53 of the *University of Baltimore Law Review*. The author would like to give special thanks to his comment advisor and mentor Sonya Ziaja for her tireless efforts in advising this comment and for supporting his passion for pursuing a career in environmental and energy law. The author would also like to thank clinical professor Peter Norman for discussions and feedback on this comment, as well as fellow students James Duffy and Hannah Krehley for their support as fellow officers of the Environmental Law Society. Their insights and discussions were greatly appreciated during the development of this work and throughout law school generally.

1. *The Largest Dam Demolition in History is Approved for a Western River*, NPR (Nov. 17, 2022, 2:54 PM), <https://www.npr.org/2022/11/17/1137442481/dam-demolition-klamath-river-california-federal-regulators-salmon> [<https://perma.cc/N67G-V3K2>].
2. *Id.*
3. *See id.*
4. *Id.*
5. *Id.*
6. *See* SANDRA POSTEL & BRIAN RICHTER, RIVERS FOR LIFE: MANAGING WATER FOR PEOPLE AND NATURE 13 (2003).

biodiversity in those ecosystems<sup>7</sup>—even though they do not produce greenhouse gas emissions comparable to other energy sources contributing to climate change.<sup>8</sup> Because hydroelectric dams exemplify the environmental impacts of a low-emission renewable energy source, they provide an opportunity to examine how our efforts to adapt to human-induced climate change affect ecosystems, people, and infrastructure.<sup>9</sup> By examining the regulatory scheme of hydroelectric power licensing and its intersection with biodiversity protection, this comment finds that current coordination mechanisms between federal agencies,<sup>10</sup> as well as state and federal interests<sup>11</sup> in hydropower generation, contribute to a fragmented process of ecosystem protection that is inadequate to balance biodiversity protection with energy production needs. This fragmented process can be resolved by adopting a holistic, flexible, and nested intergovernmental permitting scheme based on principles of adaptive governance that balance the need for renewable energy production with biodiversity protection.<sup>12</sup>

Part II of this comment provides background on ecosystem services and the loss of biological diversity, and examines the relationship between hydropower production and the effect it has on ecosystems.<sup>13</sup> Part III examines the scattered statutory and regulatory background that currently covers the intersection of hydroelectric energy production and biodiversity protection and notes some controversies that have developed in this area.<sup>14</sup> Part IV discusses how to remedy the issue of scattered authority by using principles generally developed for climate adaption law to develop a more holistic and flexible permitting scheme for hydropower-biodiversity regulation.<sup>15</sup> Ultimately, this comment concludes by suggesting the implementation of an intergovernmental permitting scheme that

---

7. *See id.* at 13–14.

8. *See* U.S. ENV'T PROT. AGENCY, EPA 430-R-22-003, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990–2020, at 3–1 (2022) (summarizing that energy related activities accounted for 81.2% of all U.S. greenhouse gas emissions and that emissions from fossil fuels contributed the majority).

9. *See* Intergovernmental Panel on Climate Change [IPCC], *Sixth Assessment Report of the Intergovernmental Panel on Climate Change: Summary for Policymakers*, at 9 (2022) [hereinafter IPCC AR6].

10. *See infra* Section III.A.

11. *See infra* Section III.B.

12. *See infra* Section IV.B.

13. *See infra* Part II.

14. *See infra* Part III.

15. *See infra* Part IV.

brings relevant stakeholders together to make the final decision on whether a licensing proposal adequately balances the needs of energy production with the need to protect biological diversity.<sup>16</sup>

## II. ECOSYSTEMS AND HYDROPOWER BACKGROUND

Our natural ecosystems, in their unaltered forms, provide benefits to human populations that are commonly referred to as ecosystem services.<sup>17</sup> Ecosystem services have a wide array of benefits ranging from natural water purification by wetlands to health benefits derived from reductions in air pollution.<sup>18</sup> Regardless of the service provided, these benefits are typically valued by determining the equivalent technological replacement cost for the service provided, balanced against the restoration costs associated with the maintenance of the ecosystem providing them.<sup>19</sup> “Non-use values” such as spiritual or aesthetic considerations can also augment an ecosystem’s value, but can be significantly more difficult to determine.<sup>20</sup> Combined, these values provide benefits to mankind through natural processes that make ecosystem conservation an asset worth conserving.

A significant part of ecosystem services relies upon the biological diversity present within those ecosystems.<sup>21</sup> However, “[c]urrent practices for natural resource exploitation are inefficient and unsustainable,” and “long[]-term economic growth is hindered by unsustainable methods and their negative impacts on natural capital.”<sup>22</sup> The unsustainable use of ecosystems has led some to conclude that, in addition to the ongoing climate change crisis, we are also experiencing a biodiversity crisis.<sup>23</sup> Additionally, “[t]he

16. See *infra* Section IV.B.

17. ROBIN KUNDIS CRAIG, ENVIRONMENTAL LAW IN CONTEXT 103 (5th ed. 2022); see also Gretchen C. Daily & Pamela A. Matson, *Ecosystem Services: From Theory to Implementation*, 105 PROC. NAT’L ACAD. SCI. U.S. 9455, 9455 (2008) (noting new approaches that align economic well-being, conservation, and environmental well-being and providing summaries of several research papers on the subject).

18. CRAIG, *supra* note 17, at 103–04.

19. See *id.* at 103.

20. *Id.*

21. See Courtney E. Gorman et al., *Reconciling Climate Action With the Need for Biodiversity Protection, Restoration and Rehabilitation*, 857 SCI. TOTAL ENV’T, No. 159316, 2022, at 2 (noting that biodiversity within an ecosystem is part of the natural capital that makes up the ecosystem services that a particular ecosystem provides); see also Carl Folke et al., *Regime Shifts, Resilience, and Biodiversity in Ecosystem Management*, 35 ANN. REV. ECOLOGY, EVOLUTION, & SYSTEMATICS 557, 569–73 (2004).

22. Gorman et al., *supra* note 21, at 2.

23. See *id.* at 1; see also IPCC AR6, *supra* note 9, at 13.

biodiversity and climate crises are entwined in a complex system of feedbacks, with [the] biodiversity part of the Earth system regulating climate, and climate in turn determining biodiversity patterns and trajectories.”<sup>24</sup> This relationship between ecosystem services, biological diversity, and natural resource use can be found in ecosystem impacts created by dams built in the United States throughout the twentieth century.<sup>25</sup>

Dam construction significantly alters the environment such that valuable ecosystem services and biological diversity are entirely lost or greatly diminished in order to serve anthropocentric needs.<sup>26</sup> Dams are constructed to provide human populations with access to freshwater, electricity, and flood protection.<sup>27</sup> In the United States, most modern dam construction began in the early twentieth century, with the majority occurring from the 1950s through the 1970s.<sup>28</sup> Since then, the number of dams in the United States has grown to approximately 91,000 as of 2021.<sup>29</sup> Dams impound water that once ran as a free-flowing river or stream, which in turn alters the natural flow that the river ecosystem depends upon and changes that environment.<sup>30</sup> The altered flows negatively impact the biodiversity and ecosystem services that were present prior to the dam’s construction.<sup>31</sup> These impacts often pose a serious risk to

24. Gorman et al., *supra* note 21, at 2.

25. See POSTEL & RICHTER, *supra* note 6, at 3.

26. See *id.*; see also Joshua H. Viers, *Hydropower Relicensing and Climate Change*, 47 J. AM. WATER RES. ASS’N 655, 656 (2011) (“Hydropower systems adversely impact riverine ecosystems in numerous ways . . . including the disruption of fish migratory routes; alteration to the flow regime, which can disrupt reproduction of aquatic and riparian organisms alike; alteration of geomorphic processes that can either deprive sediment from downstream ecosystems or create conditions of scour and incision; and alter the quality of downstream waters, most typically temperature.” (citation omitted)).

27. See POSTEL & RICHTER, *supra* note 6, at 1; see also Carl J. Bauer, *The Long View of the Water/Energy Nexus: Hydropower’s First Century in the U.S.A.*, 60 NAT. RES. J. 173, 175 (2020).

28. See CYBERSECURITY & INFRASTRUCTURE SEC. AGENCY, DAMS SECTOR PROFILE 2 (2021); see also Bauer, *supra* note 27, at 175–78.

29. See CYBERSECURITY & INFRASTRUCTURE SEC. AGENCY, *supra* note 28, at 6.

30. See POSTEL & RICHTER, *supra* note 6, at 21 (explaining that dams disrupt natural ecosystem-sustaining processes by preventing natural floods and altering baseline levels of flow that would otherwise occur).

31. See *id.* at 24–25. The authors note that altered flows create adverse ecosystem impacts in four main ways. First, they prevent the natural flow from shaping the physical geography which affects the distribution of plants and animals. Second, species native to that river system have evolved to rely upon the natural flow of the river. Third, some species require certain conditions such as water depth at certain times of year to

environmental health and must be balanced against our anthropocentric need for benefits derived from the dam.<sup>32</sup> Thus, the question of how to deal with the environmental trade-off of anthropocentric needs and ecosystem needs is a matter of policy.<sup>33</sup>

### III. FRAGMENTED PROCESS LEAVES BIODIVERSITY IN THE BACKGROUND

The intersection of hydroelectric power generation and biodiversity protections is covered by a broad range of federal agencies, authorizing statutes, and state governments.<sup>34</sup> This section looks at several federal agencies that are responsible for either hydroelectric power production, environmental protection, or conservation.<sup>35</sup> Under each agency examined, this comment examines the relevant authorizing statute, as well as other relevant statutory provisions, that empowers or limits that agency's action.<sup>36</sup> This section then looks at the relationship between federal and state duties in hydroelectric power and biodiversity protection.<sup>37</sup> Finally, it notes controversies that have arisen at the nexus of biodiversity protection and hydroelectric energy production.<sup>38</sup>

#### A. *Federal Agencies at the Intersection of Hydropower and Biodiversity*

Before examining individual agencies, the statutes that give them their authority, and the ways in which that authority scatters biodiversity protection in relation to dam projects, it is important to discuss the National Environmental Policy Act (NEPA). NEPA is a federal statute that requires "all agencies of the Federal Government" to include a statement on the environmental impacts of a proposed action for every "proposal[] for legislation [or] other major [f]ederal action[] significantly affecting the quality of the human

---

sustain their biological systems such as breeding, migration, and feeding. Finally, the altered flows favor non-native species that then compete with the native species for resources. *Id.* at 20–21. Additionally, the altered flows also affect ecosystem services such as water purification by preventing flood waters from reaching wetlands that provide those services. *Id.* at 25.

32. *See id.* at 4.

33. *See infra* Part III.

34. *See infra* Section III.C.

35. *See infra* Section III.A.

36. *See infra* Section III.A.

37. *See infra* Section III.B.

38. *See infra* Section III.C.

environment.”<sup>39</sup> This statement is known as an environmental impact statement (EIS); to determine whether an agency must prepare an EIS, the Council on Environmental Quality (CEQ) has promulgated several threshold considerations that the agency must answer.<sup>40</sup> If the initial thresholds do not preclude NEPA review, then the agency proposing the action determines the appropriate level of NEPA analysis<sup>41</sup> by performing an environmental assessment (EA) to provide evidence of the need for an EIS and discuss alternatives if necessary.<sup>42</sup> Once these procedures are complete, the acting agency will either perform the EIS or promulgate a finding of no significant impact (FONSI), both of which are subject to judicial review under the Administrative Procedure Act (APA) and subject to public comment.<sup>43</sup>

While NEPA provides a baseline level of environmental consideration, it is important to note its limitations. Courts have determined that NEPA is a procedural statute that “‘does not mandate particular results,’ but ‘simply provides the necessary process’ to ensure that federal agencies take a ‘hard look’ at the environmental consequences of their actions.”<sup>44</sup> NEPA also contains a timing element that requires an agency to begin the NEPA process “as close as practicable to the time the agency is developing or receives a proposal” so that the information can be a part of the decision-making process and not “used to rationalize or justify decisions already made.”<sup>45</sup> Additionally, “NEPA does not have a citizen suit provision,” so anyone who wishes to challenge the adequacy of an agency’s NEPA process must do so under the APA.<sup>46</sup> It is with this environmental regulatory background in mind that this comment will review the agencies responsible for dams and biodiversity protection.

---

39. 42 U.S.C. § 4332(2)(C).

40. 40 C.F.R. § 1501.1 (2023). The regulation requires an agency to make several determinations such as whether the action is exempt from the NEPA process, conflicts with the requirements of another statute, whether NEPA compliance would be inconsistent with the Congressional intent of another statute, whether the action is a “major [f]ederal action,” the discretionary or non-discretionary nature of the proposed action, and whether another statute’s requirements fulfill the purpose of NEPA compliance. *Id.* § 1501.1(a).

41. *Id.* § 1501.2(b)(2).

42. *Id.* § 1501.5(c).

43. See CRAIG, *supra* note 17, at 391; see also 40 C.F.R. §§ 1503.1–.4 (2020).

44. Muckleshoot Indian Tribe v. U.S. Forest Serv., 177 F.3d 800, 814 (9th Cir. 1999) (quoting Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 350 (1989)).

45. 40 C.F.R. § 1502.5 (2020).

46. See CRAIG, *supra* note 17, at 388.



# 1. FERC & Federal Conservation Statutes

The Federal Energy Regulatory Commission, or FERC, is an independent agency under the Department of Energy that is primarily responsible for the interstate transmission of electricity as well as licensing hydropower projects.<sup>47</sup> Specifically, the Department of Energy Organization Act defines FERC's jurisdiction concerning dams as:

[T]he investigation, issuance, transfer, renewal, revocation, and enforcement of licenses and permits for the construction, operation, and maintenance of dams, water conduits, reservoirs, powerhouses, transmission lines, or other works for the development and improvement of navigation and for the development and utilization of power across, along, from, or in navigable waters under part I of the Federal Power Act.<sup>48</sup>

Because this jurisdictional grant of authority is a transfer from the Federal Power Act, the language of that act applies to FERC.<sup>49</sup> The Federal Power Act provides that:

[i]n deciding whether to issue any license . . . for any project, . . . [FERC] shall give equal consideration to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of, fish and wildlife (including related spawning grounds and habitat), . . . and the preservation of other aspects of environmental quality.<sup>50</sup>

While this language incorporates consideration of wildlife into the licensing process, several other statutes also affect FERC's determination process.

---

47. *What FERC Does*, FERC (Feb. 1, 2024), <https://www.ferc.gov/what-ferc-does> [<https://perma.cc/768J-6XCV>]. FERC was established under the Department of Energy Organization Act and assumed the powers that were originally granted to the Federal Power Commission under the Federal Power Act. *See* 42 U.S.C. §§ 7171–72.

48. 42 U.S.C. § 7172(a)(1)(A).

49. *Id.* § 7172(a)(1). This section transfers to FERC the duties of the Federal Power Commission, which is statutorily authorized to carry out the Federal Power Act under 16 U.S.C. § 797.

50. 16 U.S.C. § 797(e).

a. *The Wild and Scenic Rivers Act*

FERC's ability to license a dam for hydroelectric power generation is also subject to the limitations in the Wild and Scenic Rivers Act (WSRA).<sup>51</sup> Section 1278 of the WSRA prohibits FERC from licensing any project that would directly affect any river designated under Section 1274 of WSRA<sup>52</sup>—which lists the rivers Congress has designated as part of the National Wild and Scenic River System.<sup>53</sup> However, this restriction does not apply to any part of a river that is above or below the designated section, provided that any action taken in those sections does not “unreasonably diminish the scenic, recreational, and fish and wildlife values present in the area on the date of designation.”<sup>54</sup> The WSRA also requires that no agency recommend authorization of or request appropriations for a project without first notifying the Secretary of the Interior, the Secretary of Agriculture, or both.<sup>55</sup> Thus, this Act's effect on FERC is to prohibit the licensing of dams within specifically designated sections of rivers

---

51. *See id.* § 1278(a).

52. *Id.*

53. *See id.* §§ 1273–75. Under this Act, the Secretary of the Interior, the Secretary of Agriculture, or both submit recommendations to Congress to amend Section 1274 by adding a new scenic river to the list. *Id.* § 1275.

54. *Id.* § 1278(a). This raises the question: What is an unreasonable diminishment of a river? A question that to some requires consideration of the flows, temperature, and chemistry of the entire river system and their impact on the species that reside there. *See* POSTEL & RICHTER, *supra* note 6, at 44 (noting that changes in flow, temperature, and chemistry can affect the food chain of a river system in such a way that the entire health of the river declines and adversely affects the entire ecosystem).

55. *See* 16 U.S.C § 1278(a). Specifically, the language of this section states:

No department or agency of the United States shall recommend authorization of any water resources project that would have a direct and adverse effect on the values for which such river was established, as determined by the Secretary charged with its administration, or request appropriations to begin construction of any such project, whether heretofore or hereafter authorized, without advising the Secretary of the Interior or the Secretary of Agriculture, as the case may be, in writing of its intention so to do at least sixty days in advance, and without specifically reporting to the Congress in writing at the time it makes its recommendation or request in what respect construction of such project would be in conflict with the purposes of this chapter and would affect the component and the values to be protected by it under this chapter.

*Id.*

and to require that FERC notify the relevant department if it intends to license a dam that would affect those specifically designated river sections.<sup>56</sup>

*b. The Endangered Species Act*

The Endangered Species Act (ESA) is possibly the strongest statute that exists for the purposes of protecting biological diversity in the face of government action.<sup>57</sup> Under the ESA, Section 1536(a) provides two key protections that apply to not only FERC, but all federal agencies.<sup>58</sup> These two requirements are known as the conservation and jeopardy requirements, and both require that an acting federal agency consult with the Secretary of the agency responsible for the endangered species concerned.<sup>59</sup> The conservation requirement in Section 1536(a)(1) requires that all federal agencies “in consultation with and with the assistance of the Secretary, utilize their authorities in furtherance of the purposes of this chapter by carrying out programs for the conservation of endangered species and threatened species listed.”<sup>60</sup> This Section has created significant tension between water use from dams and conservation of species.<sup>61</sup>

56. It is important to note here that Section 1278 only requires FERC to notify in writing of the intent to license a dam that would affect a designated wild or scenic river. The Section does not state whether the notified secretaries have the power to act on that notification in any meaningful way. *See id.*

57. *See Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 181–83 (1978) (holding that the congressional intent in passing the Endangered Species Act was to place the preservation of species as a higher priority than other federal projects). It is also important to note that this landmark litigation grew out of the discovery of a freshwater fish species, the snail darter, whose habitat would have been destroyed by the construction of the Tellico Dam. *See id.* at 153.

58. *See* 16 U.S.C. § 1536(a) (using inclusive language such as “[a]ll other Federal agencies” and “[e]ach Federal agency” when discussing the scope of the section).

59. *See id.*; *see also id.* § 1532(15) (defining “Secretary” as either the Secretary of the Interior, Secretary of Commerce, or, if the endangered species is a plant, the Secretary of Agriculture). In most cases a consultation concerning hydroelectric dams will concern the Secretary of the Interior and will involve the National Fish and Wildlife Service. *See CRAIG, supra* note 17, at 522, 600.

60. 16 U.S.C. § 1536(a)(1).

61. *See Carson-Truckee Water Conservancy Dist. v. Clark*, 741 F.2d 257, 259–60 (9th Cir. 1984). In this case, the tension arose after the dam was complete, but the issue concerned whether the Secretary of the Interior had the power under Section 1536(a)(1) to refuse to sell water held by the dam in an effort to conserve the populations of two endangered fish species that existed in the lake that fed the dam. *Id.* The court held that, under Section 1536(a)(1), the Secretary’s obligations under the ESA are of a higher priority than those of the act that authorized the construction and sale of water from the dam, and that the Secretary could utilize his authority in furtherance of the ESA without abusing his discretion. *See id.* at 260. This tension

The jeopardy requirement in Section 1536(a)(2) requires that all federal agencies consult with the appropriate Secretary and “insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat.”<sup>62</sup> Section 1536(a)(2) ultimately imposes several procedural requirements: the production of a biological assessment to determine the potential effects on listed or proposed species,<sup>63</sup> an optional informal consultation to allow the United States Fish and Wildlife Service (USFWS) to suggest modifications to the proposed action,<sup>64</sup> a formal consultation if deemed necessary by the USFWS to determine any adverse impacts on listed species the proposed action will have,<sup>65</sup> and the issuance of a biological opinion which the acting agency must consider to proceed with the proposed action.<sup>66</sup>

Keeping in line with the other statutes concerned with the intersection of FERC and conservation protections, the ESA’s effect on the licensing of a dam is to prevent the intrusion of federal projects on endangered species by requiring that FERC follow complex regulatory interactions with other agencies to meet the demands of the statute. Additionally, while the ESA provides strong statutory protection for endangered species, it falls short of protecting biological diversity because its focus is on individual species, not ecosystems.<sup>67</sup> The ESA also falls short because it is reactive instead of proactive, protecting endangered or threatened species only after they are listed, as opposed to preventing species from becoming endangered in the first place.<sup>68</sup> The ESA also contains an interesting exception procedure to Section 1536(a) that brings together the Secretaries of several major agencies and one presidentially appointed individual from each affected state to sit on a committee that can allow for a federal action to proceed even though it may

---

between water use, dams, and conservation of species is still an ongoing issue that is particularly difficult to balance and continues to be a source of contention in the American west where water scarcity continues to worsen. *See* CRAIG, *supra* note 17, at 603–05.

62. 16 U.S.C. § 1536(a)(2).

63. *See* 50 C.F.R. § 402.12 (2022).

64. *See id.* § 402.13.

65. *See id.* § 402.14.

66. *See id.* § 402.15.

67. *See* POSTEL & RICHTER, *supra* note 6, at 98–99.

68. *Id.* at 99.

otherwise not comply with the conservation and jeopardy requirements.<sup>69</sup>

*c. The Fish and Wildlife Coordination Act*

The last statute directly concerned with the intersection of dam licensing and biological diversity protection is the Fish and Wildlife Coordination Act (FWCA).<sup>70</sup> This legislation directs the Secretary of the Interior to ensure that “wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development programs through the effectual and harmonious planning, development, maintenance, and coordination of wildlife conservation and rehabilitation.”<sup>71</sup> Sections 662 and 663 of the FWCA specifically focus on the effect that impounded water has on wildlife.<sup>72</sup> Those sections require that when any department or agency of the United States, or any private or public agency acting under the authority, license, or permit of the United States, proposes or authorizes the impoundment of any body of water, it must first consult with USFWS, the Department of the Interior (DOI), and the head of the relevant state agency responsible for wildlife.<sup>73</sup> The DOI and the relevant state agency must then prepare a report concerning, amongst other things, the estimation of wildlife benefits and losses,<sup>74</sup> which must be adopted and presented to whichever governmental body has the authority “to authorize the construction of water-resource development projects or . . . approve a report on the modification or supplementation of plans for previously authorized projects, to which this Act applies.”<sup>75</sup> Additionally, under Section 663, whenever a United States department or agency impounds or alters a body of water, a provision of that water must be used “for the conservation, maintenance, and management of wildlife resources thereof, and its habitat thereon, including the development and improvement of such wildlife resources.”<sup>76</sup> FWCA thus promotes

69. See 16 U.S.C. § 1536(e). The Endangered Species Committee’s unique composition is in some ways akin to the holistic view discussed below. See *infra* Part IV.

70. 16 U.S.C. §§ 661–63. Sections 662 and 663 directly concern the impoundment of water and its effects on wildlife. See *id.* §§ 662–63. Dams by design impound water whether the intended use is for generation of hydroelectric power, flood control, or water storage and thus this statute is applicable to all such uses including the subset under FERC jurisdiction.

71. *Id.* § 661.

72. See *id.* § 662(a).

73. *Id.*

74. See *id.* § 662(e).

75. See *id.* § 662(b).

76. See *id.* § 663(a).

intergovernmental coordination that FERC must consider when it makes the determination of whether to grant or deny a hydroelectric dam license.<sup>77</sup>

## 2. Federal Agencies Concerned with the Protection of Biological Diversity

Although the statutes discussed above require FERC to engage in a certain level of analysis concerning biological diversity protection,<sup>78</sup> the agencies that include biological diversity as part of their core mission must also be examined. This section will briefly discuss the U.S. Fish and Wildlife Service (USFWS or FWS)<sup>79</sup> and the Environmental Protection Agency (EPA)<sup>80</sup> to provide a sense of their duties as they relate to the protection of biological diversity.

### a. *The United States Fish and Wildlife Service*

The USFWS is the only current federal agency that has the conservation of biological diversity as its primary mission.<sup>81</sup> The Fish and Wildlife Act of 1956 authorizes the USFWS to perform several functions in the pursuit of conservation.<sup>82</sup> The main function of the USFWS is to enact all wildlife conservation statutes through the management of protected habitats, such as wildlife refuges and the operation of wildlife resource programs.<sup>83</sup> Additionally, the USFWS conducts ecological studies, performs fish and wildlife studies, assists with environmental impact assessments, and reviews environmental impact statements.<sup>84</sup>

---

77. *See id.* §§ 661–63.

78. *See supra* Section III.A.1.

79. *See infra* Section III.A.2.a.

80. *See infra* Section III.A.2.b.

81. *See About Us*, U.S. FISH & WILDLIFE SERV., <https://www.fws.gov/about> [<https://perma.cc/NW6T-CU3Y>]. The Fish and Wildlife Service was formed in 1940 under the Reorganization Act of 1939 which consolidated two similar agencies, the Bureau of Fisheries and the Bureau of Biological Survey housed under the Departments of Commerce and Agriculture, into a single agency within the Department of the Interior. 5 U.S.C. App. 1. It also transferred the duties of the previous agencies as they were described in their authorizing acts. *See id.*

82. *See* 16 U.S.C. §§ 742a–742c.

83. *See* WEST’S FED. ADMIN. PRAC., FEDERAL ENVIRONMENTAL LAW § 5228 (2022). These statutes include the ESA, the FWCA, the Anadromous Fish Conservation Act, as well as a long list of other specific conservation statutes. *See id.* § 5274.

84. *See id.* § 5228.

b. *The Environmental Protection Agency*

The Environmental Protection Agency (EPA) has broad jurisdiction to enforce statutes and promulgate regulations concerning pollution to our nation's land, air, and waters.<sup>85</sup> The most applicable statutory authority on the intersection of dams and biological diversity can be found under the Federal Water Pollution Control Act (CWA).<sup>86</sup> The focus of the CWA's jurisdiction is on pollution discharged into waters of the United States (WOTUS).<sup>87</sup> However, it is important to note that the protections afforded under the CWA have a significant impact on the health of freshwater ecosystems and are therefore related to the goals of protecting biological diversity.<sup>88</sup>

The CWA has two main permitting decision schemes that are relevant to the effect dams have on biological diversity.<sup>89</sup> The first is the National Pollutant Discharge Elimination System (NPDES), which allows for a person to discharge pollutants into a WOTUS if they have a permit to do so.<sup>90</sup> This permitting program also allows the EPA Administrator to impose conditions on the approval of a permit that the applicant must comply with; these conditions may include reporting and data collection, as well as other conditions that the Administrator deems appropriate.<sup>91</sup> While this permitting program is initially authorized under EPA's authority, individual states may apply for NPDES permitting authority to be delegated to the state environmental agencies.<sup>92</sup> This kind of shared authority is

---

85. See *Laws and Executive Orders*, ENV'T PROT. AGENCY (Jul. 27, 2022), <https://www.epa.gov/laws-regulations/laws-and-executive-orders> [<https://perma.cc/BP6B-G5W7>].

86. See CRAIG, *supra* note 17, at 1013 (noting several wildlife conservation issues raised in *Nat'l Wildlife Fed'n v. Gorsuch*, 693 F.2d 156 (D.C. Cir. 1982) that were created by dams that contribute to changes in water quality).

87. See 33 U.S.C. § 1311(a).

88. See *Nat'l Wildlife Fed'n v. Gorsuch*, 693 F.2d 156, 174–77 (D.C. Cir. 1982) (arguing that dam discharges constitute additions of a pollutant under the CWA that adversely affect fish populations); see, e.g., *Nat'l Wildlife Fed'n v. Consumers Power Co.*, 862 F.2d 580, 581–82 (6th Cir. 1988) (arguing that hydroelectric dams in Lake Michigan discharged pollutants into the water by trapping and destroying fishing in the power production mechanisms).

89. See 33 U.S.C. § 1342. This Section contains the National Pollutant Discharge Elimination System (NPDES). See also *id.* § 1344. This Section is the dredge and fill permit program and concerns the removal and discharge of material from a WOTUS.

90. See *id.* § 1342(a)(1).

91. *Id.* § 1342(a)(2).

92. *Id.* § 1342(b). This delegation is permitted if the EPA determines that the state meets several statutory requirements. *Id.*

part of the CWA's scheme of cooperative federalism and fosters environmentally beneficial relationships between state and federal governments.<sup>93</sup>

The second program is the Dredge and Fill permitting program, which concerns the removal and discharge of “dredged or fill” material into a WOTUS.<sup>94</sup> The United States Army Corps of Engineers (USACE) administers this permitting program,<sup>95</sup> but the EPA retains the statutory power to set guidelines for issuing permits<sup>96</sup> and the power to veto individual permits,<sup>97</sup> thus retaining the authority to oversee this program's contributions to water pollution. Similar to the NPDES permit program, states can also apply to have this permitting authority delegated to their state agencies, but few states have done so.<sup>98</sup>

*B. State Interest in the Control of the Hydroelectric Power and Biodiversity*

This section begins by briefly explaining the general scheme of federalism that currently governs federal–state relationships as they pertain to energy regulation.<sup>99</sup> Then it will discuss how hydroelectric power generation falls into that scheme.<sup>100</sup> Finally, it will describe the role and authority States hold in biodiversity protection.<sup>101</sup> Both of these concepts are necessary backdrops to consider the proposal this comment argues for in Part IV.<sup>102</sup>

*1. Federal–State Relations in Energy Regulation*

The relationship between federal and state energy regulation has traditionally been described as a system of dual sovereignty.<sup>103</sup> Under this scheme, the state and federal governments' jurisdictions are separated by a “‘bright line’ that defines spheres of exclusive

---

93. See CRAIG, *supra* note 17, at 1000–01.

94. See 33 U.S.C. 1344(a).

95. *Id.* § 1344(d).

96. *Id.* § 1344(b)(1).

97. *Id.* § 1344(c).

98. *Id.* § 1344(g)–(h).

99. See *infra* Section III.B.1.

100. See *infra* Section III.B.1.

101. See *infra* Section III.B.2.

102. See *infra* Part IV.

103. See Jim Rossi, *The Brave New Path of Energy Federalism*, 95 TEX. L. REV. 399, 400–01 (2016).



authority.”<sup>104</sup> Primarily, the separation of power is most prevalent in Section 824 of the Federal Power Act (FPA), which provides that the federal authority over energy “shall apply to the transmission of electric energy in interstate commerce and to the sale of electric energy at wholesale in interstate commerce.”<sup>105</sup> Section 824 further limits FERC’s jurisdiction to “facilities for such transmission or sale of electric energy, but shall not have jurisdiction . . . over facilities used for the generation of electric energy or over facilities used in local distribution or only for the transmission of electric energy in intrastate commerce.”<sup>106</sup> Thus, the general scope of electric energy regulation is constrained only to those facilities that transmit or sell electric energy in either interstate commerce or in a wholesale capacity.<sup>107</sup>

Hydroelectric power falls under this general division with a few notable exceptions concerning transmission of energy and the building of the hydroelectric infrastructure.<sup>108</sup> Section 824 of the FPA exempts from federal regulation the sale of hydroelectric energy across state lines, provided that the electricity was produced by hydroelectric generation and lawfully exported over state lines at the time the FPA was enacted.<sup>109</sup> Section 797 provides FERC with the sole authority to issue licenses for the “construct[ion], operat[ion], and maintain[ence of] dams, water conduits, reservoirs, power houses, transmission lines, or other project works” used for “development, transmission, and utilization of power” that are “across, along, from, or in” a body of water over which Congress can exercise its jurisdiction under the commerce power.<sup>110</sup> Thus, the

104. *Id.* at 400. In this article, author Jim Rossi argues that recent Supreme Court decisions have weakened the bright line theory in the context of energy market regulation such that new avenues of regulation, like cooperative federalism and dynamic federalism, could be established. *Id.* at 403.

105. *See* 16 U.S.C. § 824(b)(1).

106. *Id.* Section 824 also contains a policy statement that declares that transmission and sale of electric energy is a matter of public interest but the federal regulation of that interest “extend[s] only to those matters which are not subject to regulation by the States.” *Id.* § 824(a). However, this limit has largely been ruled to be “a ‘mere policy declaration’ that ‘cannot nullify a clear and specific grant of jurisdiction, even if the particular grant seems inconsistent with the broadly expressed purpose.’” *See* Rossi, *supra* note 103, at 413 (citing *inter alia* *New York v. FERC*, 535 U.S. 1, 22 (2002)).

107. *See* 16 U.S.C. § 824(b)(1), (d).

108. *See id.* §§ 824(b)(1), 797(e).

109. *See id.* § 824(b)(1). This exemption is subject to no less than 15 other statutory sections under the Federal Power Act that may, in some specific circumstances, allow the federal government to regulate the power that is generated by hydroelectric dams that otherwise meet this exception. *See id.* § 824(b)(2).

110. *See id.* § 797(e).

codified scope of state regulation of hydroelectric dams, and the energy they produce, is limited to either purely intrastate use, transmission, or sale, or interstate sale that was lawful at the time of the FPA's enactment.<sup>111</sup>

## 2. State Power and Duties in the Regulation of Wildlife

A state's power to regulate wildlife and protect biological diversity that resides within its jurisdiction is derived from two legal doctrines that date back as far as Roman law.<sup>112</sup> The first of these doctrines is the public trust doctrine, which embodies the idea that "some natural resources belong to all citizens in common 'and are called common property. Of this [] kind . . . are the air, the running water, the sea, the fish, and the wild beasts.'"<sup>113</sup> In the United States, the public trust doctrine operates so that

states hold certain natural resources in trust for the benefit of the people. A trustee owns and manages property for the benefit of designated beneficiaries, who have equitable ownership of the property. Trustees retain legal ownership and have fiduciary obligations to the beneficiaries. According to the public trust doctrine, states serve as trustees, and present and future generations are the beneficiaries.<sup>114</sup>

The public trust doctrine has a long history of application in early American common law, but the Supreme Court in 1892 expressly adopted it as a cognizable legal doctrine under the theory of a state's sovereign ownership of natural resources in *Illinois Central Railroad Company v. State of Illinois*.<sup>115</sup> There, the Supreme Court established two primary principles for state regulation of natural resources: "(1)

---

111. *See id.* §§ 824(b)(1), 797(e). Again, while this section describes the codified statutory divisions between state and federal jurisdiction over energy production, hydroelectric or otherwise, there is a line of Supreme Court decisions beginning with *New York v. FERC* in 2002 that dispute this "bright line" approach in favor of a jurisdictional approach that "depend[s] on pragmatic concerns surrounding the operation of energy markets reflected in the agency's factual and policy findings." *See Rossi, supra* note 103, at 430 (discussing the arguments and result of *New York v. FERC*, 535 U.S. 1 (2002)).

112. Michael C. Blumm & Aurora Paulsen, *The Public Trust in Wildlife*, 2013 UTAH L. REV. 1437, 1438–40 (2013).

113. *Id.* at 1444 (quoting *Arnold v. Mundy*, 6 N.J.L. 1 (1821)).

114. *Id.* at 1442.

115. *See id.* at 1443–47.

states must regulate the use of some resources, such as beds of navigable waterways, in a sovereign capacity and (2) states' powers to manage natural resources may be exercised only to further the public interest."<sup>116</sup>

The second legal doctrine that provides state authority to regulate wildlife is the doctrine of sovereign ownership of wildlife.<sup>117</sup> This concept embodies the idea that the "[c]olonial governments inherited the Crown's governance powers, including the power to regulate wildlife harvests"; subsequently "the original states acquired the powers vested in the American colonies, and new states acquired powers equal to the original states."<sup>118</sup> As a result, when the states became concerned with conservation of species—originally to

116. *Id.* at 1449–50 (citing *Ill. Cent. R.R. Co. v. Illinois*, 146 U.S. 387, 456–58 (1892)). It is interesting to note that the majority of public trust doctrine cases in early American jurisprudence arise in the context of navigable waterways, but since being recognized by the Supreme Court, various cases have recognized the application of the public trust to other applications such as wildlife habitats connected to navigable waters, drinking water, inland wetlands, and other wildlife such as salmon. *Id.* at 1450–51.

117. *Id.* at 1451. The historical background of this doctrine can be summarized through the familiar common law property concept of the rule of capture. *Id.* at 1452. Under ancient Roman law, wild animals were owned by no one and therefore were considered to be part of the commons belonging to all citizens of a state. *Id.* When a person captured and controlled a wild animal, they could exercise a right to it as personal property (what we now recognize as the rule of capture). *Id.* Because the state controlled the sovereign power over the territory, they also had the "sovereign power to regulate the harvest of wildlife." *Id.*

118. *Id.* at 1455 (citing *Geer v. Connecticut*, 161 U.S. 519, 527–28 (1896), *overruled in part by Hughes v. Oklahoma*, 441 U.S. 322 (1979)). *Geer* explicitly recognizes the history of the right from Roman law to English common law, to the American Colonies, to the original states. *Geer*, 161 U.S. at 527–28. However, it ultimately ruled that a state statute that restricted transportation of hunted waterfowl over state lines was a valid exercise of state police power because it prevented those hunted birds from becoming articles of commerce subject to federal regulation under the Commerce Clause. *Id.* at 534–35. It was on the latter point that *Hughes* overrules *Geer*, holding that states do not have ownership of game animals in such a manner that would defeat a Commerce Clause challenge to the state restrictions. *Hughes*, 441 U.S. at 335–36. The *Hughes* court did explicitly note that:

The overruling of *Geer* does not leave the States powerless to protect and conserve wild animal life within their borders. . . . States may promote this legitimate purpose only in ways consistent with the basic principle that "our economic unit is the Nation," and that when a wild animal "becomes an article of commerce . . . its use cannot be limited to the citizens of one State to the exclusion of citizens of another."

*Id.* at 338–39 (citing *H.P. Hood & Sons, Inc. v. Du Mond*, 336 U.S. 525, 537 (1949) and *Geer*, 161 U.S. at 538 (Field, J. dissenting)).

maintain game animal populations—“many states passed legislation regulating harvest of wildlife” and some states asserted “ownership of wildlife in statutes and constitutions.”<sup>119</sup> The Supreme Court has upheld this doctrine, and the current rule holds that states can regulate wildlife in a manner that preserves “the legitimate state concerns for conservation and protection of wild animals underlying the 19th-century legal fiction of state ownership[,]” but only “in ways not inconsistent with the Commerce Clause.”<sup>120</sup> This view has overwhelmingly become the majority view adopted by states.<sup>121</sup> Thus, because the states have a sovereign interest in the regulation of wildlife, the state policies that affect decisions at the nexus of energy and wildlife are also relevant factors.

*C. Structural Governance Issues at the Energy–Biodiversity Nexus*

As discussed above, when FERC wishes for a dam project to go forward or be relicensed, FERC must at least take the following actions:

1. Perform a NEPA analysis to determine whether its action will significantly affect the quality of the human environment and consult with the FWS and CEQ;<sup>122</sup>
2. Consult with the Secretary of the Interior, the Secretary of Agriculture, and the FWS to determine if the licensing of a dam project will directly affect a river that is designated as protected under the WSRA;<sup>123</sup>
3. Consult with the DOI, Department of Agriculture, Department of Commerce, and the USFWS to determine if the proposed project will jeopardize an endangered species or its critical habitat and, if so, determine if the project can qualify for an incidental take permit or apply for an exemption through the Endangered Species Committee;<sup>124</sup>

---

119. See Blumm & Paulsen, *supra* note 112, at 1457.

120. *Id.* at 1476 (citing *Hughes*, 441 U.S. at 335–36).

121. *Id.* at 1462 (noting that 48 states have claimed ownership of wildlife under this theory). For a wonderful breakdown of the relevant authority in each state see the appendix to Blumm and Paulsen article. *Id.* app. at 1488–504.

122. See *supra* Section III.A.

123. See *supra* Section III.A.1.a.

124. See *supra* Section III.A.1.b.

4. Comply with the FWCA by asking the DOI, FWS, and the head of the relevant state agency to prepare a report on the project;<sup>125</sup>
5. In consulting with the state, consider whether the project is entirely within FERC's statutory power or whether the state has some authority over this hydroelectric project under the FPA's Section 824 and 797 requirements, as well as consider the state's inherent sovereign authority to regulate wildlife without running afoul of the commerce clause;<sup>126</sup> and
6. If all of those considerations allow the project to proceed, then FERC must consult with the EPA and the USACE for the actual construction of the project to make sure it complies with any NPDES permits, if dams are even applicable in the project's jurisdiction, and Section 404 Dredge and Fill permits,<sup>127</sup> which could require the EPA or USACE to engage in its own NEPA analysis for the agency action or draft a supplemental NEPA analysis.<sup>128</sup>

The remainder of this section briefly highlights controversies that have arisen at the nexus of dam projects and biodiversity protection.<sup>129</sup> It will then briefly stray from that narrow scope to include other controversies that occur between renewable energy projects and biodiversity more generally.<sup>130</sup> Finally, it will identify some common themes between these controversies that are addressed by the model proposed in section IV.<sup>131</sup>

### 1. Controversies Between Dams and Wildlife

Although not itself a hydroelectric dam,<sup>132</sup> the controversy that surrounded the Tellico Dam's construction is the prime—and likely

---

125. *See supra* Section III.A.1.c.

126. *See supra* Sections III.B.1–2.

127. *See supra* Section III.A.2.b.

128. *See supra* Section III.A. This comment did not explicitly discuss supplemental NEPA analysis or the exception to NEPA when other agencies have already performed the work. However, although these exceptions do exist, it is possible that another analysis will have to be performed. *See CRAIG, supra* note 17, at 497 (discussing that supplemental environmental impact statements may be required when there are substantial changes to the proposed action, significant new circumstances or information, or it would further the purpose of the act).

129. *See infra* Section III.C.1.

130. *See infra* Section III.C.2.

131. *See infra* Section III.C.3.

132. To clarify, the Tellico Dam project's primary purpose was to spur regional shoreline development, provide recreation and flood control, and generate electricity. *See Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 157 (1978). The "Tellico Dam itself will contain

the most famous—starting point for understanding the tension between biological diversity and dam development.<sup>133</sup> In *Tennessee Valley Authority v. Hill*, the dispute was whether the Tellico Dam’s construction was to be enjoined from completion due to the discovery of a species of freshwater fish, the snail darter, that was listed under the newly enacted ESA.<sup>134</sup> The Tennessee Valley Authority (TVA) took the position that because Congress repeatedly funded the Tellico Dam project and because the dam was “70% to 80% complete when the snail darter was officially listed as endangered[,]” that it should not be enjoined.<sup>135</sup> The District Court agreed with TVA’s position, noting that

At some point in time a federal project becomes so near completion and so incapable of modification that a court of equity should not apply a statute enacted long after inception of the project to produce an unreasonable result. . . . Where there has been an irreversible and irretrievable commitment of resources by Congress to a project over a span of almost a decade, the Court should proceed with a great deal of circumspection.<sup>136</sup>

The Court of Appeals for the Sixth Circuit and the Supreme Court ultimately rejected this position on the ground that “[c]urrent project status cannot be translated into a workable standard of judicial review” because the costs associated are irrelevant when considering the “social and scientific cost attributable to the disappearance of a unique form of life.”<sup>137</sup> The Sixth Circuit also noted that its responsibility under the ESA is “to preserve the status quo where endangered species are threatened, thereby guaranteeing the legislative or executive branches sufficient opportunity to grapple

---

no electric generators; however, an interreservoir canal connecting Tellico Reservoir with a nearby hydroelectric plant will augment the latter’s capacity.” *Id.* at 157 n.4.

133. *See id.* at 168–70 (discussing the Sixth Circuit Court of Appeals reversal of the district court, noting “[i]t is conceivable that the welfare of an endangered species may weigh more heavily upon the public conscience, as expressed by the final will of Congress, than the write off of those millions of dollars already expended for Tellico in excess of its present salvageable value” (citation omitted)).

134. *See id.* at 156, 158–59.

135. *See id.* at 165–66.

136. *Id.* at 166 (quoting *Hill v. Tenn. Valley Auth.*, 419 F. Supp. 753, 760 (E.D. Tenn. 1976), *rev’d*, 549 F.2d 1064 (6th Cir. 1977), *aff’d*, 437 U.S. 153 (1978)).

137. *See id.* at 169 (quoting *Hill*, 549 F.2d at 1071).

with the alternatives.”<sup>138</sup> The Supreme Court ultimately reasoned that the plain meaning and legislative history of Section 7 of the ESA supported the conclusion that there should be no exception to the statutory mandate and that “Congress intended endangered species to be afforded the highest of priorities.”<sup>139</sup>

In *American Rivers v. FERC*, the United States Court of Appeals for the D.C. Circuit examined a FERC relicensing decision that required an examination of the intersecting statutory schemes of the FPA, NEPA, and the ESA to determine if the relicensing decision was arbitrary and capricious.<sup>140</sup> In *American Rivers*, several hydroelectric projects on the Coosa River, originally licensed in the 1920s, were due for relicensing by the end of July 2007.<sup>141</sup> The private company that owned the dams, Alabama Power, sought to combine the licenses for several of its hydroelectric projects under one license.<sup>142</sup>

FERC published a notice of the license application in the Federal Register stating that the application was ready for environmental analysis.<sup>143</sup> Several conservation stakeholders then intervened to challenge the application, but, eighteen months later, FERC published its NEPA analysis concluding that there was a Finding of No Significant Impact (FONSI).<sup>144</sup> Another two and a half years passed until the FWS issued a Biological Opinion (BiOp) which analyzed the impact of the relicensing on the nine listed endangered and threatened species and the twelve critical habitats in the project area.<sup>145</sup> The FWS BiOp concluded that the relicensing project “was not likely to ‘jeopardize’ any threatened or listed species, nor destroy or deleteriously affect any critical habitats” and thus FERC granted Alabama Power a new thirty-year license on June 20, 2013.<sup>146</sup>

---

138. *Id.* (quoting *Hill*, 548 F.2d at 1071).

139. *See id.* at 173–74. The Tellico Dam was eventually finished but it required Congress to pass legislation that specifically allowed for the Tellico project to go forward despite the ESA prohibition. Margot Hornblower, *Carter Signs Bill Forcing Tellico Dam Completion*, WASH. POST (Sept. 25, 1979, 8:00 PM), <https://www.washingtonpost.com/archive/politics/1979/09/26/carter-signs-bill-forcing-tellico-dam-completion/7e57e3c0-d186-4bcf-9930-842c07e21c81/> [<https://perma.cc/LUM3-PA7B>].

140. *See Am. Rivers v. Fed. Energy Regul. Comm’n*, 895 F.3d 32, 37–38 (D.C. Cir. 2018).

141. *Id.* at 39.

142. *Id.*

143. *Id.*

144. *Id.*

145. *Id.*

146. *Id.*

This license imposed certain conditions on Alabama Power's operation of the dams that, *inter alia*, required it to maintain certain levels of aeration (the amount of dissolved oxygen in the water) at all times.<sup>147</sup> The conservation groups and Alabama Power sought a rehearing of the licensing order from FERC, but FERC denied the rehearing to the conservation groups and granted the rehearing for Alabama Power, which resulted in reducing the aeration and water quality requirements to apply only when the dams were actually generating power.<sup>148</sup> The conservation groups then petitioned the Court of Appeals to review the licensing order on the ground that it violated the FPA, NEPA, and the ESA, while they concurrently filed a second rehearing request to FERC on the water quality standards.<sup>149</sup> FERC denied the second rehearing request, and the conservation groups again petitioned for review, with both petitions consolidated before the Court of Appeals.<sup>150</sup> After finding that the conservation groups had standing and their first petition was jurisdictionally barred because they had simultaneously sought agency reconsideration and judicial review, the court concluded that the conservation groups' second petition was timely and proper, and had sufficiently intended to seek review of the licensing decision in addition to the water quality issue.<sup>151</sup>

On the merits, the Court of Appeals found that the BiOp adopted by FERC was arbitrary and capricious and "infected the Licensing Order," thus causing FERC to violate NEPA, the ESA, and the sections of the FPA that are predicated upon the Commission's compliance with those environmental statutes.<sup>152</sup> The court found that the BiOp FWS prepared failed to "incorporate degraded baseline conditions into its jeopardy analysis" by concluding "the relicensing of the Coosa Project at this time cannot take into account the historic impacts of [cumulative] actions [beginning in the 1920s], but rather only the current and proposed future operations and their impacts."<sup>153</sup>

---

147. *Id.*

148. *Id.* at 40.

149. *Id.*

150. *Id.*

151. *See id.* at 40–45 (noting under "Fed. R. App. P. 15(a)(2)(C). . . . a 'mistaken or inexact specification of the order to be reviewed' is 'not fatal,' as long as the 'intent to seek review of a specific order [i] can be fairly inferred from the petition for review or from other contemporaneous filings, and [ii] the respondent is not misled by the mistake'" (citing *Entravision Holdings, LLC v. FCC*, 202 F.3d 311, 313 (D.C. Cir. 2000))).

152. *Am. Rivers*, 895 F.3d at 55.

153. *Id.* at 46.



The FWS decision disregarded the methodology that FWS itself sets forth in its regulations on determining an environmental baseline for a project's continuing impacts.<sup>154</sup> Additionally, the BiOp failed to explain how some of its findings of 100% incidental take of listed species were not likely to result in jeopardizing those species.<sup>155</sup> To make matters even worse, the BiOp's Incidental Take Statement "failed to include an adequate trigger for re-consultation" because the "statement [did] not provide enough guidance to explain how to determine whether 'the amount or extent of incidental take is exceeded,' particularly because incidental take is one hundred percent for multiple species."<sup>156</sup> FWS ultimately admitted that the inclusion of the re-consultation statement was "only included to meet Fish and Wildlife Service's regulatory obligations."<sup>157</sup> Thus, the BiOp was an unlawful violation of the ESA.<sup>158</sup>

On the NEPA challenge, the court found that FERC's FONSI contained "two fatal flaws."<sup>159</sup> First, FERC failed to consider "multiple indicators that the project could have a significant impact on the environment, including the types of substantial effects on fish passage and dissolved oxygen levels that would normally compel the preparation of an Environmental Impact Statement."<sup>160</sup> Then, FWS's failure to consider cumulative impacts "fatally infected" FERC's NEPA decision because it allowed the agency to ignore past actions that "were perpetuating the Coosa River's heavily damaged and fragile ecosystem" resulting in "[t]he Commission's cumulative impact analysis le[aving] out critical parts of the equation and . . . [falling] far short of the NEPA mark."<sup>161</sup>

While the two cases detailed above illustrate some of the complexities of the intersection of biodiversity protection and dam projects, they are only a small sample of the cases that deal with the tough issue of dam infrastructure and wildlife.<sup>162</sup> Nor is the larger

---

154. *Id.*

155. *Id.* at 47–48.

156. *Id.* at 48.

157. *Id.*

158. *Id.* at 48–49.

159. *Id.* at 49.

160. *Id.*

161. *Id.* at 55.

162. *See, e.g.,* Shafer & Freeman Lakes Env't Conservation Corp. v. Fed. Energy Regul. Comm'n, 992 F.3d 1071, 1078 (D.C. Cir. 2021) (holding that the FWS's scientific basis, lengthy interagency and public dialogue, and subsequent plan to release more water from an upstream dam to protect an endangered mussel species was not error); S.D. Warren Co. v. Me. Bd. of Env't Prot., 547 U.S. 370, 385–86 (2006) (holding that a dam raised the potential for discharges that triggered the need for state certification

issue of energy regulation and wildlife contained to just dam production.<sup>163</sup>

## 2. Energy and Wildlife Controversy in Other Contexts

While the focus of this comment is on the regulatory scheme that sits at the heart of dams and wildlife, the underlying tension is much broader and extends to many forms of energy production, including other green energy initiatives such as solar, geothermal, and wind.<sup>164</sup> In a compelling interdisciplinary discussion hosted by the Environmental Law Institute, a panel of attorneys and scientists discussed the energy and land use impacts on biodiversity.<sup>165</sup> Speaker Patrick Donnelly described the tension between solar power and biodiversity in the Mojave Desert as “no such thing as a free lunch.”<sup>166</sup> Donnelly went on to explain that although the desert offers opportunity for large-scale solar installations, it requires a significant amount of land use which may in turn create problems with local biodiversity.<sup>167</sup> He noted that in the Mojave “[t]here have been significant issues with the desert tortoise and utility-scale solar development involving inadequate consultation with the U.S. Fish and Wildlife Service (FWS), which precipitated numerous ESA lawsuits.”<sup>168</sup>

In another renewable energy context, Donnelly noted that “[g]eothermal energy sited next to hot springs has been found . . . to almost universally affect the springs it is sited next to.”<sup>169</sup> In Nevada, this created an issue where the Dixie Valley toad, a species that was amid the ESA process, was confronted by a proposed geothermal

---

under Section 401 of the CWA, which the state of Maine conditioned upon the dam operator maintaining river flows such that fish and other aquatic organisms were not blocked from passage); *Udall v. Fed. Power Comm’n*, 387 U.S. 428, 450 (1967) (stating that the public interest test under the Federal Water Power Act includes the public interest of preserving wild rivers and anadromous fish and remanding the award of a dam license to the Federal Power Commission to investigate the issues).

163. *See infra* Section III.C.2.

164. *See* James M. McElfish Jr. et al., *Renewable Energy and Biodiversity Conservation*, 52 ENV’T L. REP. 10079, 10079–80 (2022) (noting recent biodiversity and renewable energy goals set by the Biden Administration and noting some general challenges between biodiversity and coal, oil and gas, transportation, and renewables).

165. *Id.*

166. *Id.* at 10080.

167. *Id.*

168. *Id.*

169. *Id.* at 10081.

plant that had just begun the permitting process.<sup>170</sup> The scientists studying the Dixie Valley toad asserted that if the geothermal project went forward, it would place the toad at a significant risk of extinction.<sup>171</sup> This resulted in an initial lawsuit to compel the FWS to not delay listing the toad, and a subsequent settlement negotiation on the matter.<sup>172</sup> The settlement negotiations were unsuccessful and the Center for Biological Diversity brought a second lawsuit to enjoin the geothermal project.<sup>173</sup>

Another speaker, Margaret Spring, discussed the development of both federal and state offshore wind programs in California that may potentially conflict with protected marine biodiversity areas.<sup>174</sup> Spring explained that the challenge comes from a lack of research on the impact of offshore wind on the biodiversity in and around these areas, the aggressive pace at which the offshore wind projects are moving forward, and the fact that the federal biodiversity and offshore wind programs are led by different agencies.<sup>175</sup> Spring noted that “[a] comprehensive planning process is absolutely essential” to advance “both the renewable goal . . . and [to] protect nature and preserve biodiversity at a local and global scale.”<sup>176</sup>

### 3. The Through-Line Between These Controversies

*TVA v. Hill*, *American Rivers v. FERC*, and the other examples described above represent a fundamental tension between the need to produce energy to sustain our modern society and the value of the biological diversity affected by our anthropocentric needs.<sup>177</sup> This tension is further strained by a regulatory system of fractured processes that requires complex and time-consuming coordination between various federal and state agencies.<sup>178</sup> As described above, dam projects that were largely developed before the introduction of strong environmental regulation have led to many subsequent conflicts.<sup>179</sup> As human societies are presented with the challenges of climate change and strive to adapt to meet those challenges, the

---

170. *Id.*

171. *Id.*

172. *Id.*

173. *See id.* at 10081 n.11.

174. *See id.* at 10082.

175. *See id.* at 10083–84.

176. *See id.* at 10082, 10084.

177. *See supra* Section III.C.2

178. *See supra* text accompanying notes 122–28.

179. *See supra* Part II, Section III.C.1.

demand on our legal systems will be immense.<sup>180</sup> Because determining how to best balance the need for energy production with the value of biological diversity is a difficult question that affects stakeholders at all levels of society and governance, FERC should redesign its hydroelectric licensing scheme to include a holistic view on balancing these competing values.

#### IV. REDESIGNING FERC'S ENERGY-BIODIVERSITY REGULATION

This section begins by presenting the principles of polycentricity as explained through the concepts of dynamic federalism and nested governance, the value of flexibility, monitoring and iterative process in governance schemes, and legitimacy.<sup>181</sup> Then it applies those concepts to a proposed redesign of the FERC regulatory scheme aimed at providing adaptive governance at the hydroelectric energy-biodiversity nexus.<sup>182</sup> Finally, it argues that this redesign addresses the tensions created under the current regulatory scheme by providing better stakeholder inclusion into complex issues that require involvement at all levels of governance.<sup>183</sup>

##### A. *Design Principles for Hydroelectric Energy-Biodiversity Regulation*

The design principles that will be applied in the FERC redesign advocate for a new theory of governance “which turns ‘away from the familiar model of command-style, fixed-rule regulation . . . and toward a new model of collaborative multi-party, multi-level, adaptive, problem-solving’ governance.”<sup>184</sup> The first concept is polycentricity—an overlap in authority to respond and the presence of a common group of actors with similar authority that are all managing an issue across all scales of governance.<sup>185</sup> Related to and to some extent included within this concept are the concepts of dynamic federalism and nested governance.<sup>186</sup> Dynamic federalism is

---

180. J.B. Ruhl, *General Design Principles for Resilience and Adaptive Capacity in Legal Systems—With Applications to Climate Change Adaptation*, 89 N.C. L. REV. 1373, 1374 (2011).

181. See *infra* text accompanying notes 185–205.

182. See *infra* text accompanying notes 207–25.

183. See *infra* Section IV.B.

184. See Ruhl, *supra* note 180, at 1397.

185. See Barbara A. Cosens et al., *The Role of Law in Adaptive Governance*, 22 ECOLOGY & SOC'Y, No. 1:30, 2017, at 5.

186. See *id.*; see also Ruhl, *supra* note 180, at 1398.

a theory of governance that consists of overlapping jurisdiction between federal, state, and local governments, all of which “function as alternative centers of power” and have presumptive authority to handle any matter within their discretion.<sup>187</sup> Under dynamic federalism “multiple levels of government interact in the regulatory process” as opposed to having a patchwork of independent state and federal regulations, all of which must be complied with.<sup>188</sup> This model offers several advantages such as a “flexible distribution of authority between” different levels of government, dialogue between stakeholders, redundancy and synergy in developing policy solutions, and accountability.<sup>189</sup> Although dynamic federalism can be less efficient than other federalism models, it provides a more resilient method to developing regulation.<sup>190</sup>

The concept of nesting involves lower levels of governance that have representation within higher levels of governance.<sup>191</sup> This form of governance structure allows for potentially greater adaptive response, system-wide management, and communication between the actors in the polycentric system.<sup>192</sup> Nesting is also likely to increase a system’s ability to respond to unexpected circumstances by allowing for flexible authority and, at the same time, may minimize unforeseen issues by incorporating “local participation . . . , use of local knowledge, and tailoring of response[s].”<sup>193</sup> Like dynamic federalism, nesting involves some level of redundancy between the different levels of governance, but this redundancy works as a preventative measure against “[c]atastrophic failures” that can result from a centralized, top-down, command-style governance.<sup>194</sup> Collectively, these forms of governance, when included as part of the institution of law, capture the idea that law is the result of a “process[] of conflict, deliberation, and resolution” that is shaped by both social and economic values; the arrangement of the institution can determine value by shaping initial starting positions and rules on who may participate in the system.<sup>195</sup>

---

187. See Ruhl, *supra* note 180, at 1398.

188. See *id.* at 1398–99.

189. See *id.* at 1400.

190. See *id.* at 1401.

191. Cosens et al., *supra* note 185, at 5.

192. *Id.*

193. *Id.*

194. See Thomas Dietz et al., *The Struggle to Govern the Commons*, 302 SCI. 1907, 1910 (2003).

195. See Sonya F. P. Ziaja, *Rules and Values in Virtual Optimization of California Hydropower*, 57 NAT. RES. J. 329, 331, 334–35 (2017) (discussing how institutional

The next set of principles that should be discussed are flexibility, monitoring, and iteration. Flexibility, for the purposes of this comment, is the idea that regulation must be able to adapt to changing conditions as they arise to either: (1) meet the larger policy goal the regulation was enacted to achieve, or (2) change the overall regulatory goal when circumstances so require.<sup>196</sup> Flexibility is critical to balancing the competing values presented in this comment, but also to developing governance that can adjust to climate change more broadly and respond to changing ecological conditions as a result of climate impacts.<sup>197</sup> The concept of flexible regulation cannot succeed in the face of changing circumstances without some measure of the changing circumstances. As Dietz and Craig assert, “[e]nvironmental governance depends on good, trustworthy information about stocks, flows, and processes within the resource systems being governed, as well as about the human-environment interactions affecting those systems.”<sup>198</sup> To achieve this high level of information, Craig says, “adaptation law should . . . increase requirements and funding for continual monitoring and basic scientific and economic research to promote understanding of climate change impacts at all scales and across sectors. This will help policymakers avoid overly simplistic ‘solutions’ to, and panaceas for, climate change adaptation.”<sup>199</sup> Finally, iteration for the purpose of adapting governance requires repeated “cycles of goal determination, model building, performance standard setting, outcome monitoring, and standard recalibration.”<sup>200</sup> Iteration serves the other necessary

---

economics analysis is intertwined with the evolution of legal rules); *see also* Cosens et al., *supra* note 185, at 5.

196. *See* Lisa Dilling et al., *The Dynamics of Vulnerability: Why Adapting to Climate Variability Will Not Always Prepare Us for Climate Change*, 6 WIREs CLIMATE CHANGE 413, 418–19 (2015) (providing one definition for flexibility in the adaptive capacity context); *see also* Robin Kundis Craig, “Stationarity is Dead” — *Long Live Transformation: Five Principles for Climate Change Adaptation Law*, 34 HARV. ENV’T L. REV. 9, 17–18 (2010) [hereinafter *Stationarity is Dead*] (providing the author’s definition for principled flexibility as a principle for climate change adaption law).

197. *See Stationarity is Dead*, *supra* note 196, at 65.

198. *Id.* at 40 (citing Dietz et al., *supra* note 194, at 1908).

199. *Id.* at 41.

200. Ruhl, *supra* note 180, at 1391. In his work, Ruhl establishes the “full loop of adaptive management” as:

- (1) definition of the problem, (2) determination of goals and objectives for management of ecosystems, (3) determination of the ecosystem baseline, (4) development of conceptual models,

principles when applied by a polycentric governance model by establishing flexibility and focusing the monitoring efforts on specific goals.<sup>201</sup>

Legitimacy is “the acceptance of authority because it is both perceived to be and is exercised appropriately.”<sup>202</sup> Legitimacy can be fostered through public participation, “deliberation, accountability, transparency, consistency, stability, and review and recourse for those aggrieved by a governmental action.”<sup>203</sup> Many of these goals are achieved through polycentric governance and nesting, each of which includes local participation.<sup>204</sup> The fostering of legitimacy can promote stability, especially when the actors in a polycentric system reach a consensus on management processes.<sup>205</sup> With these principles in place, we can now adapt them to FERC’s regulatory scheme.

*B. Redesigning FERC’s Hydroelectric Licensing Process.*

The first step in redesigning FERC’s licensing process is to rearrange the scattered process summarized in Part III.C into a polycentric system utilizing dynamic federalism to bring federal and state interests into a nested governance format.<sup>206</sup> This can be achieved by placing hydropower licensing authority in a council or committee of stakeholders. Instead of requiring FERC to comply with the FWCA by consulting with several other state and federal agencies after it receives a license application,<sup>207</sup> the applicant would simply apply to a single regulatory committee housed within FERC that is comprised of those state and federal agencies. This change alone would likely facilitate broader communication between stakeholders and facilitate the development of multi-tiered shared

---

(5) selection of future restoration actions, (6) implementation and management actions, (7) monitoring and ecosystem response, and (8) evaluation of restoration efforts and proposals for remedial actions.

*Id.* For our purposes, the more general cycle will do.

201. *See id.* at 1392–93.

202. Cosens et al., *supra* note 185, at 7–8.

203. *Id.* at 8.

204. *Id.* at 5.

205. *See* Dietz et al., *supra* note 194, at 1909 (noting an example of shareholders coming together to adopt a management system for the Mississippi River that causes significantly less conflict than alternatives).

206. *See supra* notes 122–28 and accompanying text for a summary of the scattered process FERC must follow when considering a licensing proposal; *see supra* notes 185–95 and accompanying text for discussion of polycentricity.

207. *See supra* note 125 and accompanying text.

authority that is prepared to manage unique ecological systems.<sup>208</sup> Additionally, bringing state and federal stakeholders together to negotiate a system for nesting regulation will provide an opportunity for local oversight of local natural resources while concurrently allowing higher tiers of governance to set guidelines or limitations on objectives.<sup>209</sup> Shared authority arrangements would be the product of broad negotiations that may not occur in a system requiring FERC to consult with each federal and state interest independently. Shared authority therefore broadens stakeholder capacity to prevent potential environmental harms.<sup>210</sup>

For shared authority arrangements to be resilient and persevere, we must apply flexibility, monitoring, and iteration principles.<sup>211</sup> We could achieve flexibility by giving the stakeholder committee the ability to divide oversight as necessary for the particular licensure project.<sup>212</sup> For example, if a species of endangered fish requires certain aeration levels in the water to comply with the ESA's no jeopardy requirement, then the committee might allow local regulation and management with regular interval reporting to the FWS. Conversely, if local regulators are unable, unwilling, or unreliable, the committee could instead allow FWS to actively regulate the aeration and endangered species issues, while leaving most of the management to the local regulator. Flexibility in regulatory authority will allow for greater synergy across all levels of regulation.<sup>213</sup>

---

208. See Cosens et al., *supra* note 185, at 5 (discussing how nested governance creates greater potential for adaptive management); see Ziaja, *supra* note 195, at 340 (“[N]o [single] set of rules [governing] hydropower generat[ion] is exactly the same set of rules for any other hydropower generation station.”).

209. See Dietz et al., *supra* note 194, at 1908 (noting that larger scale governance “may authorize local control, help it, hinder it, or override it” and can be utilized as a governance tool with significant impacts); see also Cosens et al., *supra* note 185, at 5 (discussing how implementation of local knowledge in adaptive governance can facilitate and stabilize innovation and adaptation in water governance).

210. See Cosens et al., *supra* note 185, at 6 (“Participatory capacity reduces the likelihood of marginalization of portions of society and, in doing so, increases the likelihood that all aspects of a system will be considered in decision-making.”)

211. See *supra* text accompanying notes 196–201 for discussion of flexibility, monitoring, and iteration and *supra* notes 200–01 for discussion of iteration.

212. See *Stationarity is Dead*, *supra* note 196, at 65–67 (noting that climate adaption law requires agencies to respond to changing ecological conditions and shifting goals on a nearly continuous basis and calling for creative thinking in restructuring agencies to allow for more breathing room in climate adaptation).

213. Ruhl, *supra* note 180, at 1400 (discussing how dynamic federalism promotes synergy between agencies and information networks).



This example also alludes to the importance of monitoring.<sup>214</sup> For shared authority governance relationships to work, the subject of the regulation—here a fish species impacted by a hydroelectric dam—must be continuously monitored to ensure that the agreed-upon arrangement achieves the desired results.<sup>215</sup> Continuous monitoring requires significant transparency between the level of governance directly regulating the issue and the other levels.<sup>216</sup> However, if the entire process is an iterative cycle, transparency and cooperation are in the best interests of all actors.<sup>217</sup> If the distribution of regulatory authority is reevaluated at regular intervals, upon certain conditions, or both, then it would not benefit one level of authority to refuse to share its monitoring information. In response, other stakeholders could simply use their overlapping authority to manage the issue in a manner in line with the agreed goals.<sup>218</sup> Thinking of the hypothetical endangered fish, if the local level of governance maintains aeration levels from the dam in a manner that jeopardizes the species, the FWS—or presumptively any other authority—could step in to fix the issue. Conversely, if the FWS failed to effectively manage aeration, or had neglected its duty to do so, the state or local governance could

214. See *supra* text accompanying notes 198–99 for discussion of monitoring.

215. See Cosens et al., *supra* note 185, at 8 (discussing how monitoring improves learning and results, enhances legitimacy, and serves accountability goals); see *Stationarity is Dead*, *supra* note 196, at 40–41 (noting that “[e]nvironmental governance depends on good, trustworthy information about stocks, flows, and processes within the resource systems being governed, as well as about the human-environment interactions affecting those systems” and that “[l]ack of knowledge . . . particularly at the level of specific resources and ecosystems and local communities, limits citizens’ and governments’ abilities and willingness to make rational choices regarding adaptation strategies, thus undermining adaptive capacity”). But see Holly Doremus, *Adaptive Management as an Information Problem*, 89 N.C. L. REV. 1455, 1496–98 (2011) (concluding that adaptive management governance imposes significant costs to implement monitoring and learning processes and that an analysis of whether adaptive management will achieve the desired policy goals ought to be performed before implementation).

216. See Dilling et al., *supra* note 196, at 414 (calling for “more discerning and transparent examination of risks, uncertainty, and tradeoffs in adaptation decision making”).

217. See Ruhl, *supra* note 180, at 1402–03 (concluding that adaptive management, of which iteration is a feature, allows a system to recalibrate, but that this ability must be balanced against stability if the system is to be resilient). If in our proposed redesign the system being adapted is the mode of governance itself, then recalibration could include a delegation of power from one presumptively legitimate authority to another; monitoring would then include who has the information and whether they are sharing it. If an actor is not sharing its information, that would likely be raised when the cycle considers what needs to be recalibrated.

218. See *supra* text accompanying notes 185–95.

step in to fill the gap and assert that it is better positioned to manage the issue when the iterative cycle is revisited.<sup>219</sup>

The final concept to consider is legitimacy.<sup>220</sup> This aspect is less an action to be taken and more a product of maintaining a proper and transparent process. Nonetheless, some actions can be taken to promote legitimacy. First, like all of administrative law, there must be a level of meaningful public participation.<sup>221</sup> While the state and local interests are directly represented in the proposed polycentric governance scheme, it would promote legitimacy to provide seats at the metaphorical table for the interested public.<sup>222</sup> Although this might mean allowing interested groups to voice their opinions in an iterative cycle of governance, it could also mean allowing for notice and comment participation from the general public under the principles of the APA or its state equivalent.<sup>223</sup> It could also take the form of an industry participating locally in self-regulation.<sup>224</sup> Another way to foster legitimacy is through education on the subject and the means of regulation. If, as part of the monitoring process, the information—including the data and results—is regularly provided to the public along with the necessary means to understand that information, then the public will be more likely to accept them as legitimate, or, if it does not like the results, will be more likely to participate in the process.<sup>225</sup> Either option promotes integration of

219. See Cosens et al., *supra* note 185, at 8 (discussing how monitoring improves learning and results, enhances legitimacy, and serves accountability goals).

220. See *supra* text accompanying notes 202–05.

221. Jonathan Skinner-Thompson, *Procedural Environmental Justice*, 97 WASH. L. REV. 399, 403–04 (noting that meaningful public participation requires regulators to be aware of three principles of administrative law, including consideration of all significant comments during notice and comment period, that significant comments may cause an agency to change its course of action, and that legal challenges to agency decision-making is based on issues raised during the comment period).

222. Indeed, FERC itself has noted the need for greater public participation in its process. See FED. ENERGY REGUL. COMM’N, THE OFF. OF PUB. PARTICIPATION (2021), <https://www.ferc.gov/media/ferc-report-office-public-participation> [<https://perma.cc/PLY6-JQ5T>].

223. See Cosens et al., *supra* note 185, at 8; see also *supra* text accompanying notes 43–46.

224. A good example of this kind of self-governance for a common resource is the lobster industry off the coast of Maine. See Elinor Ostrom, *A General Framework for Analyzing Sustainability of Social-Ecological Systems*, 325 SCI. 419, 419–20 (2009).

225. See Cosens et al., *supra* note 185, at 8 (noting procedural justice, a subset of the process of promoting legitimacy according to Cosens, “includes attention to transparency, the right to seek review, and engagement at the appropriate level”).

local knowledge which will result in a more legitimate form of governance.

These principles, if applied to FERC's licensing scheme, ensure the authority to permit, build, operate, maintain, and oversee hydroelectric power production will be collectively placed in the hands of those who must be actively involved and those who will be directly impacted by the dam's compliance with environmental statutes aimed at protecting biological diversity. Instead of allowing for a front-end decision, reached through a complex and lengthy consultation process, the adaptive governance scheme would allow all relevant stakeholders to consider the licensing application and work together to reach an appropriate balance. Moreover, this kind of decision-making process would be iterative and would reconsider the license on a more regular basis as opposed to the current thirty- to fifty-year licenses that FERC establishes now. These adaptive principles create a better balance between a hydroelectric project's usefulness and its impact on the ecosystem in which it resides and will allow those values to be reconsidered as we experience the effects of climate change in the coming centuries.

## V. CONCLUSION

As this comment has discussed, hydroelectric dam licensing involves a lengthy and complex process of coordination between federal and state agencies to balance biodiversity protection with hydroelectric energy production.<sup>226</sup> This process often falls short of protecting ecosystems and results in litigation over the proper process.<sup>227</sup> Moreover, the larger tension between the values of biodiversity protection and energy production is not limited to only hydroelectric production and will likely increase as society struggles to adapt to climate change.<sup>228</sup> To resolve the tension between these competing values, the fractured statutory process of hydroelectric dam licensing should be redesigned to embody a holistic, flexible, and nested intergovernmental permitting scheme that brings federal, state, and local stakeholders together to develop a regulatory scheme based on shared knowledge.<sup>229</sup> This proposed method of governance facilitates greater synergy in developing policy solutions, promotes greater information sharing, and allows regulators the flexibility to

---

226. *See supra* Part III.

227. *See supra* Section III.C.1.

228. *See supra* Section III.C.2.

229. *See supra* Section IV.B.

adapt to changing conditions.<sup>230</sup> Overall, this form of polycentric governance better regulates biodiversity protection and hydroelectric energy production and creates a new process that offers a holistic view of regulating the inherent tension at the heart of the hydropower-biodiversity nexus.<sup>231</sup>

---

230. *See supra* Section IV.B.

231. *See supra* Section IV.B.

