

# The Standing of Nature: The Delineated Natural Ecosystem Proxy

Stacy Jane Schaefer\*

## I. Introduction

*Man's attitude toward nature is today critically important simply because we have now acquired a fateful power to alter and destroy nature. But man is a part of nature, and his war against nature is inevitably a war against himself. . . .*

*[W]e are challenged as mankind has never been challenged before to prove our maturity and our mastery, not of nature, but of ourselves.<sup>1</sup>*

Rachel Carson made this observation more than fifty years ago, and the intervening decades have borne out her conclusion. Our attitude toward nature, and the refusal of the legal system to acknowledge nature's legal standing, have resulted in legally authorized environmental destruction that has accumulated and accelerated to such an extent that it presents an existential threat to nature and therefore humanity.

---

*\* After earning her J.D. from the George Washington University Law School in 1994, the author served as a judicial clerk for the Honorable Joel F. Dubina, United States Court of Appeals for the Eleventh Circuit. She spent the first decade of her career representing corporations as a litigation attorney with the Washington, D.C.-based law firm of Arnold & Porter. Ms. Schaefer now serves as the Associate Director of Land Conservation at the Maryland Department of Natural Resources, where she works alongside scientists from government and nongovernmental organizations to identify and conserve ecologically significant lands. The views expressed in this Article are solely those of the author and do not reflect policies or positions of the Department of Natural Resources or the State of Maryland. The author would like to thank Margaret Clune Giblin, Christina Harrington, Linda Sheehan, Jonathan A. McKnight, and Wendy Ruth Walker for sharing their knowledge and for their encouragement and honesty while reviewing early drafts. The author also would like to thank the thorough and professional work of the Editors of JEEL. Finally, the author wishes to thank her husband and son, Alex and Morgan Schaefer, for their unwavering support and our countless conversations and debates about how nature might be recognized in the law.*

1. CBS Reports: *The Silent Spring of Rachel Carson* (CBS television broadcast Apr. 3, 1963).

Our laws support corporate rights to exist and thrive economically. That seems logical in capitalist societies, as large fortunes can ride on corporate well-being. Corporations, however, are not connected to the natural world in the way humans are. Humans breathe air, drink water and need food to survive. In the face of modern society's attempt to use science to detach itself from nature, science has repeatedly shown that we are inextricably connected to the environment just like any other living thing.<sup>2</sup>

United States jurisprudence does not yet reflect this connection; there is no legal analog to corporate rights that establishes nature's right to exist, thrive and defend itself from harm. A lawyer cannot directly represent nature to protect it. Although the Supreme Court's standing doctrine recognizes a corporation as a "juristic person,"<sup>3</sup> it does not recognize nature in the same way. In fact, injury to the environment is *not relevant* in determining whether a person seeking to protect the environment has standing in an environmental protection case.<sup>4</sup>

*"Why shouldn't nature have the same legal standing as the companies seeking to exploit it?"<sup>5</sup>*

- 
2. See generally NEIL A. CAMPBELL ET AL., BIOLOGY (11th ed. 2016).
  3. See Hope M. Babcock, *A Brook With Legal Rights: The Rights of Nature in Court*, 43 ECOLOGY L.Q. 1, 34 (2016), <http://scholarship.law.berkeley.edu/elq/vol43/iss1/1> ("Corporations have particularly found the courthouse doors open to them. This trend began in 1819 when the Marshall Court authorized the Trustees of Dartmouth College to bring suit . . . [and] continues to the present in the form of the Roberts Court's extension of the First Amendment to businesses in cases such as *Citizens United v. Federal Communications Commission* and *Burwell v. Hobby Lobby Stores*.").
  4. See *Friends of the Earth, Inc. v. Laidlaw Envtl. Servs. (TOC), Inc.*, 528 U.S. 167, 181 (2000) ("The relevant showing for purposes of Article III standing . . . is not injury to the environment but injury to the plaintiff."); see Babcock, *supra* note 3, at 18 ("It is important to give nature the independent legal right to go to court to protect itself from harm because the current system will not allow others to intervene on nature's behalf.").
  5. See Andre Dao, *What if Trees Could Sue?*, NEW PHILOSOPHER, Nov. 2016, at 66.

This question is not new.<sup>6</sup> The concept of nature having rights has its roots in indigenous cultures<sup>7</sup> and has gained traction in some legal systems.<sup>8</sup> There remains a perception however, that recognizing nature as a “juristic person” is bridge too far in the context of the U.S. legal system.<sup>9</sup>

This Article submits that such recognition is entirely manageable and offers a mechanism through which recognition of nature’s legal personhood can conform to established legal doctrines without offending notions of judicial economy or the political question doctrine.<sup>10</sup> Identification and delin-

ation of a natural ecosystem facing harm—a Delineated Natural Ecosystem (“DNE”)—offers a scientifically-based *distinct and definable* “juristic person” proxy for nature that is comparable to the juristic person construct of a corporation. Of course, a natural ecosystem exists in nature and not the courtroom. But the construct of a DNE—scientists and attorneys using verifiable scientific methodologies and modern technology to establish the DNE by virtue of the location and the effects of the underlying allegations of injury—is fit for the courtroom.

A corporation achieves “legal personhood” via legal forms and registration fees.<sup>11</sup> Nature, on a case-by-case basis, can achieve “legal personhood” via the identification of the DNE plaintiff using science-based methods and data. This same science can identify the injury or threatened injury and the proximate cause of such injury. As such, the DNE proxy is a construct that creates a juristic person with *functional structure* that is both scientifically verifiable and judicially manageable.<sup>12</sup> The DNE proxy will be created and exist, like a corporation, “in contemplation of the law.”<sup>13</sup>

Use of a DNE proxy for nature will align jurisprudence with modern science and provide a mechanism to bring balance to the adversarial judicial process. The DNE tool is tailored to the Supreme Court’s standing doctrine because it allows the party with a “direct stake in the outcome”<sup>14</sup> to stand before the court and defend itself from those who seek to harm it. From a broader perspective, this mechanism may enable realization of “productive and enjoyable harmony between man and his environment.”<sup>15</sup>

Although using the DNE mechanism to recognize nature’s “legal personhood” requires only a short analytical step, it

6. See, e.g., *Sierra Club v. Morton*, 405 U.S. 727, 741–45 (1972) (Douglas J., dissenting). See *infra* Part IV; *Pa. Gen. Energy Co. v. Grant Twp.*, 658 Fed. Appx. 37, 38 n.2 (3d Cir. July 27, 2016) (questioning but not ruling on whether an ecosystem is a proper party); *The Colo. River Ecosystem v. Colorado*, No. 17-02316 (D. Colo. filed Sept. 26, 2017). See also CORMAC CULLINAN, *WILD LAW* (2011); Babcock, *supra* note 3, at 2–3; Christopher D. Stone, *Should Trees Have Standing?—Toward Legal Rights for Natural Objects*, 45 S. CAL. L. REV. 450 (1972); AUSTRALIAN EARTH LAWS ALLIANCE AND AUSTRIAN CENTRE FOR THE RIGHTS OF NATURE, <https://www.earthlaws.org.au> [<https://perma.cc/2NZ6-UBPV>]; GLOBAL ALLIANCE FOR THE RIGHTS OF NATURE, <http://therightsofnature.org> [<https://perma.cc/2JK7-UEWQ>]; Linda Sheehan, “Earth Jujitsu”—Escaping the Climate Chokehold by Adapting to Nature’s Rights, Presentation at TEDxMarin (2013), <http://www.tedxmarin.org/2013-speakers/linda-sheehan> [<https://perma.cc/WB7R-VLZY>]; see generally EARTH LAW CTR., <https://www.earthlawcenter.org/mission> [<https://perma.cc/VW2H-RMD7>] (“[W]orks to transform the law to recognize and protect nature’s inherent rights to exist, thrive and evolve”).
7. See, e.g., Enrique Salmón, *Kincentric Ecology: Indigenous Perceptions of the Human-Nature Relationship*, 10(5) ECOLOGICAL APPLICATIONS 1327, 1327–29 (2000) <https://www.fws.gov/nativeamerican/pdf/tek-salmon-2000.pdf> [<https://perma.cc/CE6J-8RWP>]; see also *Australian Indigenous Cultural Heritage*, AUSTRALIAN GOVERNMENT, <http://www.australia.gov.au/about-australia/australian-story/austn-indigenous-cultural-heritage> [<https://perma.cc/S6VK-F4B3>].
8. In 2017, four rivers were granted legal personhood status: the Whanganui River in New Zealand, the Ganges and Yamuna Rivers in India, and the Atrato River in Colombia. See Colin Dwyer, *A New Zealand River Now Has the Legal Rights of a Human*, NPR: THE TWO-WAY (Mar. 16, 2017 6:09 PM), <http://www.npr.org/sections/two-way/2017/03/16/520414763/a-new-zealand-river-now-has-the-legal-rights-of-a-human> [<https://perma.cc/T6X4-YEDD>]; Jason Daley, *India’s Ganges and Yamuna Rivers Are Given the Rights of People*, SMITHSONIAN (Mar. 23, 2017), <http://www.smithsonianmag.com/smart-news/ganges-and-yamuna-rivers-given-rights-people-india> [<https://perma.cc/NL6Z-25NY>]; see also CONSTITUCIÓN POLÍTICA DEL ESTADO PLURINACIONAL DE BOLIVIA [CONSTITUTION], 2009, art. 33–34 (Bol.), [https://www.constituteproject.org/constitution/Bolivia\\_2009.pdf](https://www.constituteproject.org/constitution/Bolivia_2009.pdf) [<https://perma.cc/LGB4-6ZFN>]; CONSTITUCIÓN DEL ECUADOR [CONSTITUTION], Sept. 2008, arts. 71–73 (Ecuador), <https://therightsofnature.org/wp-content/uploads/pdfs/Rights-for-Nature-Articles-in-Ecuadors-Constitution.pdf> [<https://perma.cc/P8BR-JP98>]; Law of Mother Earth and Integral Development for Living Well (Law 300/2012) (Bol.), <http://www.lse.ac.uk/GranthamInstitute/law/the-mother-earth-law-and-integral-development-to-live-well-law-no-300/> [<https://perma.cc/GHT6-X4VM>]; Law of the Rights of Mother Earth (Law 071/2010) (Bol.), <http://www.worldfuturefund.org/Projects/Indicators/motherearthbolivia.html> [<https://perma.cc/YN3R-DHUA>]; SANTA MONICA, CAL., PUB. WELFARE ORDINANCES art. 4, ch. 4.75 (2013); PITTSBURGH, PA. CODE OF ORDINANCES tit. 6, art. 1, § 618 (2010) (the “Marcellus Shale Natural Gas Drilling Ordinance”).
9. See, e.g., *Pa. Gen. Energy Co. v. Grant Twp.*, 658 Fed. Appx. 37, 38 n.2 (3d Cir. 2016) (“we are not convinced that the Little Mahoning Watershed is a proper party under Fed. R. Civ. P. 17. . . . But because this particular issue was not pursued on appeal, and given the nonprecedential nature of this opinion, we make no specific holding on the question.”).
10. As discussed more fully later in this article, see *infra* Part IV, the DNE proxy mechanism is intentionally tailored to provide “judicially discoverable and manageable standards for resolving” an environmental protection controversy. *Baker v. Carr*, 269 U.S. 186, 217 (1962). Moreover, there is no “textually

demonstrable constitutional commitment” concerning the recognition of an entity as a “juristic person.” See *Zivotofsky v. Clinton*, 566 U.S. 189, 195 (2012). Indeed, as discussed later, see *infra* Part II, the judicial recognition of entities as “juristic persons” who have standing to bring a claim has a well-established history in Supreme Court precedent.

11. *Trs. of Dartmouth Coll. v. Woodward*, 17 U.S. 518, 636 (1819) (“Being the mere creature of law, [the corporation] possesses only those properties which the charter of its creation confers upon it, either expressly, or as incidental to its very existence.”); see, e.g., DEL. CODE, tit. 8, § 101 (2017), <http://delcode.delaware.gov/title8/c001/sc01/index.shtml> [<https://perma.cc/65GE-MBAZ>] (“Any person . . . may incorporate or organize a corporation under this chapter by filing with the Division of Corporations in the Department of State a certificate of incorporation. . . . A corporation may be incorporated or organized under this chapter to conduct or promote any lawful business or purposes.”); see also Babcock, *supra* note 3, at 35–36 (reviewing theories of corporate personhood).
12. This Article’s proposal therefore offers a rebuttal to arguments made against the recognition of ecosystem claimants generally. See e.g., *Pa. Gen. Energy Co. v. Grant Twp.*, 658 Fed. Appx. 37, 38 n.2 (3d Cir. July 27, 2016) (raising doubts about whether an ecosystem is a proper party); see also *Def. Colorado Mot. to Dismiss*, *The Colo. River Ecosystem v. Colorado*, No. 17-02316 (D. Colo. filed Oct. 17, 2017) (arguing that naming the Colorado River as plaintiff was improper and judicially unmanageable).
13. See *Woodward*, 17 U.S. at 636 (“A corporation is an artificial being, invisible, intangible, and existing only in contemplation of law.”).
14. See *Sierra Club*, 405 U.S. at 740 (plaintiff must have a “direct stake” in the outcome); see also *Lujan v. Defs. of Wildlife (“Lujan II”)*, 504 U.S. 555, 560–61 (1992).
15. See National Environmental Policy Act of 1969, 42 U.S.C. § 4321 (2012).

also requires a willingness to acknowledge our fundamental connection to and responsibility for our natural world. Put another way, it will require us—as Rachel Carson recognized over 50 years ago—to “prove our maturity and our mastery, not of nature, but of ourselves.”<sup>16</sup>

## II. The Standing Doctrine

“Standing” is a constitutional doctrine that determines whether an aggrieved person is allowed to bring a claim (*i.e.* “stand”) before the court. The Constitution does not identify what requirements must be met to ensure standing; rather, the Supreme Court has developed the elements of standing over time through its case law. According to the Court, standing has three elements: first, the plaintiff must have suffered an “injury in fact.” Injury in fact must consist of an invasion of a legally-protected interest which is (a) concrete and particularized, and (b) “actual or imminent, not ‘conjectural’ or ‘hypothetical.’”<sup>17</sup> The element of “injury in fact” is a “hard floor of Article III jurisdiction that cannot be removed by statute.”<sup>18</sup> Second, there must be a causal connection between the injury and the conduct complained of—the injury has to be fairly traceable to the challenged action of the defendant, and not the result of the independent action of some third party not before the court.<sup>19</sup> Third, it must be “likely,” as opposed to merely “speculative,” that the injury will be “redressed by a favorable decision.”<sup>20</sup> The party invoking federal jurisdiction bears the burden of establishing these elements.

Much like a human plaintiff, an organization has the independent right to seek judicial review to assert its own interests. In determining whether the organization has standing, the court conducts the same Article III inquiry as in the case of a human: “has the plaintiff [organization] ‘alleged such a personal stake in the outcome of the controversy as to warrant [its] invocation of federal-court jurisdiction?’”<sup>21</sup> Inherent in the direct organizational standing doctrine is the judicial recognition of inanimate entities—states, churches, non-profit organizations, or for-profit corporations—as separate legal beings.<sup>22</sup>

The “artificial” or “juristic person” is a well-established concept in American law. Simply stated, a juristic person is a non-human entity regarded by law to have the status of personhood.<sup>23</sup> As articulated by Chief Justice John Marshall in 1819, “[a] corporation is an artificial being, invisible, intangible, and existing only in contemplation

of law.”<sup>24</sup> Legislatively, the United States Code’s Dictionary Act echoes this jurisprudence, stating that “the words ‘person’ and ‘whoever’ include corporations, companies, associations, firms, partnerships, societies, and joint stock companies, as well as individuals.”<sup>25</sup>

This Article advocates application of the Article III standing principles set forth in *Sierra Club v. Morton* and *Lujan v. Defenders of Wildlife* (“*Lujan II*”) to recognize the plaintiff that demonstrates redressable “concrete and particularized injury”<sup>26</sup> in environmental protection cases.

## III. The Missing Plaintiff

Currently, nature is wholly dependent on local and federal government agencies (such as the EPA) to promulgate appropriate environmental protection regulations and enforce these regulations and existing environmental laws.<sup>27</sup> If the agency fails to do so, human plaintiffs or inanimate organizations can attempt to seek the judiciary’s review using common law theories,<sup>28</sup> writs,<sup>29</sup> or pursuant to specific legislative authorization.

At the federal level, environmental legislation has authorized ordinary citizens to enforce environmental protection laws through citizen suits. The Endangered Species Act (“ESA”), the Clean Air Act (“CAA”), and the Clean Water Act (“CWA”) all contain citizens’ suit provisions. The ESA provides:

[A]ny person may commence a civil suit on his own behalf to enjoin any person, including the United States and any other governmental instrumentality or agency . . . who is alleged to be in violation of any provision of this chapter or regulation issued under the authority thereof; or to compel the Secretary to apply . . . the prohibitions set forth in or authorized pursuant to . . . this title with respect to the tak-

16. Jonathan Norton Leonard, *Rachel Carson Dies of Cancer “Silent Spring” Author Was 56*, N.Y. TIMES (Apr. 15, 1964), <http://www.nytimes.com/books/97/10/05/reviews/carson-obit.html> [<https://perma.cc/9G9A-DLYK>].

17. See *Lujan II*, 504 U.S. at 560.

18. *Summers v. Earth Island Inst.*, 555 U.S. 488, 497 (2009).

19. *Lujan II*, 504 U.S. at 560–61.

20. *Id.* at 561.

21. *Havens Realty Corp. v. Coleman*, 455 U.S. 363, 378–79 (1982) (quoting *Baker v. Carr*, 369 U.S. 186, 204 (1962)).

22. See *id.* at 379 n.19 (finding that the plaintiff corporation had standing and stating that “organizations are entitled to sue on their own behalf for injuries they have sustained”).

23. *Juridical Person*, BLACK’S LAW DICTIONARY (10th ed. 2014).

24. See *Trs. of Dartmouth Coll. v. Woodward*, 17 U.S. 518, 636 (1819).

25. See 1 U.S.C. § 1 (2012); see also Emily J. Barnett, *Hobby Lobby and the Dictionary Act*, 124 YALE L.J. 11 (2014). Not only has the Supreme Court recognized the corporation as a “legal person” but also one that has independent standing to assert U.S. Constitutional rights. See Brandon Garret, *The Constitutional Standing of Corporations*, 163 U. PA. L. REV. 95 (2014) (providing examples where the Supreme Court has recognized a corporation’s rights under the First, Fourth, Fifth, Sixth, Eighth, and Fourteenth Amendments).

26. See *Lujan II*, 504 U.S. 555, 560 (1992) (plaintiff must show “concrete and particularized injury”); *Sierra Club v. Morton*, 405 U.S. 727, 740 (1972) (plaintiff must have a “direct stake” in the outcome); see also *Warth v. Seldin*, 422 U.S. 490, 501 (1975) (plaintiff must show “distinct and palpable” injury).

27. See *Babcock*, *supra* note 3, at 18 (“[T]he executive branch is perpetually hampered by limited resources, and occasionally a lack of will, when it comes to protecting nature from harm. Congressional paralysis (or worse) in matters affecting the environment has made that branch of government the least effective of all.”); see also *Sierra Club*, 405 U.S. at 745 (Douglas, J., dissenting) (“Congress is too remote to give meaningful direction, and its machinery is too ponderous to use very often.”). Moreover, land that is owned and ostensibly “protected” by the government does not necessarily equate to preservation of natural ecosystems. See, e.g., Exec. Order No. 13792 (2017) (directing review of National Monument designations).

28. Common-law claims used for pollution cases include nuisance, trespass or negligence. See ELI, CREATIVE COMMON LAW STRATEGIES FOR PROTECTING THE ENVIRONMENT (Clifford Rechtschaffen & Denise Antolini eds., 2007).

29. See, e.g., *Pesticide Action Network N. Am. v. EPA*, 798 F.3d 809 (9th Cir. 2015) (issuing a writ of mandamus directing EPA to issue a proposed or final rule to revoke chlorpyrifos tolerances, or a full and final response to the administrative petition to cancel chlorpyrifos).

ing of any resident endangered species or threatened species . . . ; or against the Secretary where there is alleged a failure of the Secretary to perform any act or duty under . . . this title which is not discretionary with the Secretary. The district courts shall have jurisdiction, without regard to the amount in controversy or the citizenship of the parties, to enforce any such provision or regulation, or to order the Secretary to perform such act or duty, as the case may be.<sup>30</sup>

The CAA contains one section that permits citizen suits against CAA violators and a second section that allows for citizen suits challenging EPA actions made pursuant to the Act.<sup>31</sup> The CWA provides that “[any person] having an interest which is or may be adversely affected” may bring suit.<sup>32</sup>

When the alleged harm to nature does not fall under a statute with citizen suit authorization, a human plaintiff or an organization that is “adversely affected” or “aggrieved” may turn to the Administrative Procedure Act (“APA”) to challenge federal government agency actions.<sup>33</sup> The APA independently authorizes review only when “there is no other adequate remedy in a court,” and provides that a court may set aside government agency action that is “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.”<sup>34</sup>

At first blush, the legislative authorization of ordinary citizens to bring claims to enforce environmental protection laws would appear to be a powerful tool for the humans and organizations seeking to protect nature. These plaintiffs, however, often have difficulty convincing the courts they have a “direct stake” in the litigation that confers standing. This has rendered citizen suit provisions and any potential standing under the APA impotent to prevent or stop the very injury that the applicable law was designed to prevent. This is the case unless that injury (1) also harms the organizational or human plaintiff and (2) cannot be redressed without also redressing the organizational or human plaintiff.<sup>35</sup> To compound the problem, the injuries the Court has recognized to establish standing often are short-term and comparatively inconsequential “economic,” “recreational,” or “aesthetic” injuries.

In the seminal case *Sierra Club v. Morton*, the fate of the Sequoia National Forest and National Park took a back seat

to the economic, recreational or aesthetic injury of the Sierra Club (a corporation) and its human members for access to the court system.<sup>36</sup> In *Friends of the Earth, Inc. v. Laidlaw Environmental Services (TOC), Inc.*,<sup>37</sup> the Court held that there need not be any harm to water quality to support citizen suit standing under the Clean Water Act. According to the Court, “[t]he relevant showing for purposes of Article III standing . . . is not injury to the environment but injury to the plaintiff.”<sup>38</sup> What was relevant was the human plaintiffs’ “reasonable concerns” about the effects of mercury discharges into a river, which in turn affected those plaintiffs’ recreational, aesthetic, and economic interests.<sup>39</sup>

Even when humans or organizations plead recreational, aesthetic, economic or professional injury, the Supreme Court does not readily recognize either human or organizational interests in environmental protection as meeting the “injury in fact” prong of the standing test.<sup>40</sup> *Sierra Club v. Morton*, for example, arose from a challenge to a decision by the U.S. Government to license the construction of a Disney ski resort on National Forest and National Park land of exceptional ecological value.<sup>41</sup> The Sierra Club claimed that the license agreement was illegal and asserted standing based upon its long-standing interest in, and concern for, the protection of the environment.<sup>42</sup> The Court held that this generalized interest and concern for nature failed the Court’s standing test because neither the Club nor its members pled a particular cognizable injury such as loss of recreational opportunities or aesthetic enjoyment associated with the license to deforest and develop part of Sequoia National Forest and Park.<sup>43</sup>

In *Lujan v. National Wildlife Federation* (“*Lujan I*”), the claimants challenged the U.S. government’s efforts to review and classify hundreds of parcels of public lands in a manner that might have resulted in their use for mining.<sup>44</sup> Following the precedent set in *Sierra Club*, the claimants asserted injury to their “recreational and aesthetic” enjoyment of lands in the vicinity of public lands that had been opened to mining and oil and gas leasing claims.<sup>45</sup> The Court denied standing, since the claimants alleged only that they used unspecified lands “in the vicinity” of “immense tracts of territory, only on some portions of which mining activity had occurred or probably will occur” by virtue of the manner by which the government had classified the public lands.<sup>46</sup> The Court held that an interest in lands that

30. Endangered Species Act, 16 U.S.C. § 1540(g) (2012).

31. See Clean Air Act, 42 U.S.C. §§ 7604, 7607 (2012) (permitting citizen suits against CAA violators and challenging EPA actions, respectively).

32. See, e.g., Toxic Substances Control Act, 15 U.S.C. §§ 2618, 2619 (2012); Surface Mining Control and Reclamation Act, 30 U.S.C. § 1270(a) (2012); Clean Water Act, 33 U.S.C. § 1365(g) (2012) (exemplifying that other major federal environmental statutes authorize citizen suits); Ocean Thermal Energy Conversion Act, 42 U.S.C. § 9124 (2012); Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9659 (2012).

33. 5 U.S.C. § 702 (2012); see, e.g., *Lujan v. Nat’l Wildlife Fed’n*, 497 U.S. 871, 882-83 (1990).

34. 5 U.S.C. § 704 (2012).

35. See generally Francisco Benzoni, *Environmental Standing: Who Determines the Value of Other Life?*, 349 DUKE ENVTL. L. & POL’Y F. 347 (2008), (arguing that in common law actions, the injury is focused on the person’s use and enjoyment of “his” land (nuisance); a person’s interest in exclusive “possession” of his land (trespass); or injury to a person proximately caused by another’s negligent act).

36. *Sierra Club v. Morton*, 405 U.S. 727, 727 (1972).

37. 528 U.S. 167, 173-74 (2000).

38. *Id.* at 181.

39. *Id.* at 183-84.

40. *Id.*

41. *Sierra Club*, 405 U.S. at 729-30.

42. *Id.* at 730.

43. *Id.* at 735. The Mineral King is an area of great natural beauty nestled in the Sierra Nevada Mountains, adjacent to Sequoia National Park. It has been part of the Sequoia National Forest since 1926. The Sequoia National Forest, named for the world’s largest trees, has the greatest concentration of giant sequoia groves in the world. *Id.* at 728.

44. *Lujan v. Nat’l Wildlife Fed’n*, 497 U.S. 871, 871 (1990).

45. *Id.* at 872.

46. *Id.*

“simply lay in the vicinity of areas subject to development” was inadequate to confer standing.<sup>47</sup>

In *Lujan II*, Justice Scalia, writing for the majority, made clear that the citizen suit provision of the Endangered Species Act could not give a citizen standing to protect an endangered species absent a concrete human (or corporate) injury.<sup>48</sup> In that case, the Department of the Interior promulgated a regulation that exempted actions taken by the U.S. Government overseas or on the high seas from the Endangered Species Act. The Defenders of Wildlife’s claim to injury (to assert standing) was that two of its human members (“the plaintiffs”) had traveled to foreign countries and observed endangered animals (Nile crocodiles, Asian elephants and leopards) in their native habitat, and these animals were now threatened with extinction by the action of the U.S. Government in financing foreign dam building projects, including the Aswan Dam in Egypt.<sup>49</sup> The human plaintiffs asserted that they intended to go back to the endangered animals’ habitat and would be harmed if the animals were to become extinct. They asserted an ecosystem nexus argument (a human who uses part of the ecosystems has standing), an animal nexus argument (humans who have an interest in studying or seeing the endangered animals have standing) and a vocational nexus argument (humans who have a professional interest in endangered animals have standing) to support their claims.<sup>50</sup>

In rejecting these arguments, the Court held that the plaintiffs failed to demonstrate how extinction of the endangered animals would produce any imminent injury to the humans since they did not have any definite, concrete plans to return to the countries and native habitats of the animals.<sup>51</sup> The Court stated: “To say that the [Endangered Species] Act protects ecosystems is not to say that the Act creates (if it were possible) rights of action in [humans] who have not been injured in fact, that is, [humans] who use portions of an ecosystem not perceptibly affected by the unlawful action in question.”<sup>52</sup> According to the Court, the plaintiffs’ claims were too broad and insufficiently particularized to show concrete and imminent injury:

. . . there is absolutely no basis for making the Article III inquiry turn on the source of the asserted right. Whether the courts were to act on their own, or at the invitation of Congress, in ignoring the concrete injury requirement described in our cases, they would be discarding a principle fundamental to the separate and distinct constitutional role of the Third Branch—one of the essential elements that identifies those “Cases” and “Controversies” that are the business of the courts rather than of the political branches.<sup>53</sup>

47. *Id.* at 887-89.

48. *Lujan v. Defs. of Wildlife*, 504 U.S. 555, 555 (1992) [hereinafter *Lujan II*].

49. *Id.* at 562-63.

50. *Id.* at 562-64.

51. *Id.* at 566.

52. *Id.*

53. *Id.* at 576. In rejecting the Endangered Species Act citizen suit provision, Justice Scalia appears to set forth a circular line of reasoning and ultimately renders the Court above Congress (which he claims he is avoiding). Justice Scalia asserts that the courts cannot impinge upon Congress’ providence: the problem of course is that Congress has instructed the courts to provide standing via the citizen suit provisions in the environmental protection laws. In *Lujan II* and other cases,

The rhetorical statement that harm to ecosystems that are the habitat of endangered species does “not perceptibly affect” humans lacks both moral and factual grounding. In fact, if we put aside the troubling moral implications of a legal regime that permits humans to extinguish other species at our choosing,<sup>54</sup> Justice Scalia’s statement rings false from a purely utilitarian perspective. Humans are dependent on the Earth’s natural functioning ecosystems and the biodiversity they sustain. Humans rely on rivers for clean water and edible food. Animals play important roles in maintaining these functional ecosystems. Crocodiles “clean up” those rivers as they eat carcasses of other species and balance rivers’ aquatic populations.<sup>55</sup> Elephants play a crucial role in the forest ecosystems: commonly referred to as a ‘keystone’ species, elephants help open up forest clearings and distribute the seeds of trees and shrubs<sup>56</sup> upon which humans rely for food, shelter, clean air, and clean water.

As a predator, the Asian leopard fulfills an important ecological role in controlling the populations and health of the species on which it preys. Thus, predators affect the ability of biodiversity to persist as part of a healthy natural ecosystem.<sup>57</sup>

#### IV. Proposal: The Delineated Natural Ecosystem Plaintiff

In 1972, Justice Douglas wrote the following as part of his dissent in *Sierra Club v. Morton*:

The critical question of “standing” would be simplified and also put neatly in focus if we fashioned a federal rule that allowed environmental issues to be litigated before federal agencies or federal courts in the name of the inanimate object about to be despoiled, defaced, or invaded by roads and bulldozers, and where injury is the subject of public outrage. Contemporary public concern for protecting nature’s ecological equilibrium should lead to the conferral of standing upon environmental objects to sue for their own

the Court proclaimed that its own creation of Article III standing requirements prohibits the Court from granting standing to those who Congress dictates be given standing, and the Court declares that it is so prohibited because of the *Court-created* requirements for standing. This case ultimately reveals the Court’s general discomfort with the citizen suit provision. As Justice Blackman was compelled to note in *Lujan II*, “I have difficulty imagining this Court applying its rigid principles of geographic formalism anywhere outside the context of environmental claims. As I understand it, environmental plaintiffs are under no special constitutional standing disabilities. Like other plaintiffs, they need show only that the action they challenge has injured them, without necessarily showing they happened to be physically near the location of the alleged wrong.” *Id.* at 595.

54. To be clear, this Article does not advocate putting aside the moral implications of destruction of nature.

55. “Crocodilians are implicated in positive effects in their environments as ‘keystone species’ that maintain ecosystem structure and function by their activities. These include selective predation on fish species, recycling nutrients, and maintenance of wet refugia in droughts.” See IUCN/SSC CROCODILE SPECIALIST GROUP, CROCODILES: STATUS SURVEY AND CONSERVATION ACTION PLAN 1 (James Perin Ross, ed., 2d. ed. 1998), <https://portals.iucn.org/library/sites/library/files/documents/1998-012.pdf> [https://perma.cc/6TYA-3DY8].

56. See *Keystone Species*, NAT’L GEOGRAPHIC (2017), <https://www.nationalgeographic.org/encyclopedia/keystone-species> [https://perma.cc/77XZ-BWSX].

57. See *Snow Leopard*, WORLD WILDLIFE FUND CHINA, [http://en.wwfchina.org/en/what\\_we\\_do/species/fs/snow\\_leopard](http://en.wwfchina.org/en/what_we_do/species/fs/snow_leopard) [https://perma.cc/PA3P-945J].

preservation. . . . Inanimate objects are sometimes parties in litigation. A ship has a legal personality, a fiction found useful for maritime purposes. The corporation sole—a creature of ecclesiastical law—is an acceptable adversary, and large fortunes ride on its cases. The ordinary corporation is a “person” for purposes of the adjudicatory processes, whether it represents proprietary, spiritual, aesthetic, or charitable causes. So it should be as respects valleys, alpine meadows, rivers, lakes, estuaries, beaches, ridges, groves of trees, swampland, or even air that feels the destructive pressures of modern technology and modern life.<sup>58</sup>

This is a moving passage that, at the time, could not offer a workable mechanism to identify a proxy for nature’s legal personhood. As Professor Jonathan Cannon observes in his book, *Environment in the Balance*, there could be many issues associated with recognizing nature’s ability to have standing in its own right: “Which things in nature would be represented? Why the River [as in Justice Douglas’ dissent in *Sierra Club*] and not the watershed or the ecosystem of which the river is a part? And is the River the exclusive voice of the ‘ecological unit of life’ that is a part of it, or does each unit have potential standing in its own right?”<sup>59</sup> And as Professor Hope Babcock points out, “nature lacks any functional structure remotely similar to a corporation.”<sup>60</sup>

This Article’s proposal of the DNE proxy offers a mechanism to produce a nameable and distinct legal entity with “functional structure” comparable to a corporation. Nature’s DNE proxy in each case is established by virtue of the location and the effects of the underlying injury; use of science-based classification systems and “operational” ecosystem definitions enable us to name, delineate and describe a DNE proxy and the injury it faces or has sustained. Geographic Information System (“GIS”) technology can then demonstrate, on a single map, a polygon of a DNE proxy with different layers of information collected from a variety of sources, including remote sensing imagery, cartographic data, as well as data collected from previous research and surveys, on site assessments, drones, and photographs.<sup>61</sup>

A natural ecosystem is an organization that includes living organisms in a geographic area as well as the physical environment—all functioning together as a unit.<sup>62</sup> Use of the DNE proxy therefore provides a site-specific “umbrella” to

cover the physical environment, interconnected biodiversity, natural habitats and natural processes such as water filtration, air purification and soil retention. As such, the DNE proxy inherently represents nature’s interest in existing, persisting, and maintaining and regenerating its vital cycles in a threatened or injured geographic area. It is an entity in nature that—through science-based human delineation—becomes nature’s legal person proxy that fits within the Court’s standing doctrine framework.

### A. Delineating the Natural Ecosystem Using Science’s Classification Systems

Natural ecosystem classification is not new. Humans have delineated and classified the land in one way or another for millennia to identify where food, clean water, medicinal plants, and other raw materials could be found.<sup>63</sup> Today, classification of nature is the subject of peer-

“Just as a human family has a diverse set of members living under one roof, but can be identified by one name, so too ecosystems have a diverse set of species interacting with each other and their habitat, to which a name can be given.”

[www.natureserve.org/conservation-tools/standards-methods/ecosystem-classification](http://www.natureserve.org/conservation-tools/standards-methods/ecosystem-classification)

reviewed scientific literature and relies on verifiable objective information.<sup>64</sup> Numerous ecological classifications “exist at international, national, state and local scales.”<sup>65</sup> These classifications fulfill a variety of purposes in environmental protection and conservation work. For example, scientists from academic institutions, federal and state agencies, and multiple organizations and international partners have worked together for decades to develop and maintain the International Vegetation Classification (“IVC”).<sup>66</sup> The IVC is used by most federal agencies in the United States as well as state level natural heritage programs.<sup>67</sup> Natural heritage classifications that have been uniquely developed for their own states are either linked or can be “cross-walked” to the IVC or the U.S. National Vegetation Classification (“NVC”).<sup>68</sup> The “community type” level in a natural heritage classification corresponds to the NVC “Association” level.<sup>69</sup> Since 2001, a

58. *Sierra Club v. Morton*, 405 U.S. 727, 742-44 (1972).

59. JONATHAN Z. CANNON, *ENVIRONMENT IN THE BALANCE* 87 (2015).

60. Babcock, *supra* note 3, at 37.

61. “A geographic information system (GIS) is a computer system for capturing, storing, checking, and displaying data related to positions on Earth’s surface. By relating seemingly unrelated data, GIS can help individuals and organizations better understand spatial patterns and relationships. . . . GIS can include “information about the landscape, such as the location of streams, different kinds of vegetation, and different kinds of soil. . . . two major types of GIS file formats are raster and vector. Vector formats are polygons that use points (called nodes) and lines. Vector formats are useful for storing GIS data with firm borders.” [www.nationalgeographic.org/encyclopedia/geographic-information-system-gis](http://www.nationalgeographic.org/encyclopedia/geographic-information-system-gis) (last visited on Nov. 23, 2017).

62. This Article uses the term “natural ecosystem” as synonymous of “ecological community” or “natural community.” Each natural ecosystem “has a distinct set of environmental conditions that support certain species adapted to those conditions.” See DANIEL D. SPERDUTO & WILLIAM F. NICHOLS, *NATURAL COMMUNITIES OF NEW HAMPSHIRE* 9 (Ben Kimball & Pete Bowman eds., 2d ed. 2011).

63. *Id.*

64. Reference to and hypothetical application of ecological classification systems and other research cited in this Article is not intended to reflect the views of the authors or publishers of that work with respect to the legal rights of nature and/or the DNE proxy concept as set forth herein.

65. See ANDY CUTKO, *NATURESERVE, BIODIVERSITY INVENTORY OF NATURAL LANDS: A HOW-TO MANUAL FOR FORESTERS AND BIOLOGISTS* 9 (2009).

66. *Id.*

67. *Id.*

68. See *id.*; see also GARY P. FLEMING & KAREN D. PATTERSON, VA. DEP’T OF CONSERVATION & RECREATION, *NATURAL COMMUNITIES OF VIRGINIA: ECOLOGICAL GROUPS AND COMMUNITY TYPES* at i (2017) (describing the NVC as a “jurisdictional subset” of the IVC). In addition, a relatively recent “Ecological Systems classification” has been developed. See CUTKO, *supra* note 65, at app. 2. This classification system “describes landscapes in terms of their component NVC alliances and associations. The nesting of NVC associations within systems allows users to go back and forth between the two classification approaches.” *Id.*

69. See FLEMING & PATTERSON, *supra* note 68, at iii. Each NVC Association is assigned a unique identifier code from NVC’s databases, which are maintained

public-private network of independent organizations known as the “NatureServe Network” has operated across the Western hemisphere, collecting, curating, and analyzing data about animals, plants and ecological communities using a “rigorous set of field and data management and protocols.”<sup>70</sup>

Classification of nature “attempts to organize the ecological complexity of nature; that is, the complex relationships of living things with their non-living environment, into discrete classes. In turn, these classes provide ecosystem targets for inventory, mapping, research, monitoring, restoration, and conservation.”<sup>71</sup>

The Virginia<sup>72</sup> and Maryland<sup>73</sup> Natural Heritage programs provide working examples of state level Natural Community classification approaches.<sup>74</sup> Each is organized into the same four levels from broadest to most specific:

- System (Broadest Level)
- Ecological Class
- Ecological Community Group
- Ecological Community Type

Five distinct ecological Systems have been identified in both Maryland and Virginia from broadest to most specific<sup>75</sup>:

- Terrestrial
- Palustrine
- Estuarine
- Marine
- Riverine

Each System is distinguished from another by large-scale geomorphic, hydrologic, biologic and chemical features. The Terrestrial System, for example, consists of upland habitats “that have well-drained soils ranging from dry to mesic in moisture regime.”<sup>76</sup> The Terrestrial System “supports vegetation that is predominately upland and never hydrophytic even if occasional flooding or soil saturation occur.”<sup>77</sup> In contrast, the Palustrine System “encompasses all non-tidal, perennial wetlands,” “characterized by emergent vegetation.”<sup>78</sup> It is comprised of hydrophytic vegetation and includes wetlands that are permanently saturated by groundwater seepage, permanently flooded wetlands, and seasonally or intermittently flooded wetlands.<sup>79</sup>

Within each System are Classes, which “serve to group natural communities based on similar ecological characteristics such as soil moisture (e.g., Mesic Forests versus Dry Forests) or hydrology (e.g., Alluvial Wetlands versus Non-Alluvial Wetlands).”<sup>80</sup> While Virginia and Maryland have many similarities, their physiographic and topographic differences begin to become more obvious at this classification level. The divergence of identified Classes demonstrates the flexibility inherent in the general concept of classification systems: as long as each classification system is itself internally consistent, the variety of different classification systems can reflect the variety of nature in different physical settings.

For example, within the Terrestrial System, Maryland has identified:

- The Mesic Forest Class
- The Dry-Mesic Forests and Woodlands Class
- The Dry Forests and Woodlands Class
- The Glades, Barrens and Rock Outcrops Class
- The Maritime Forests, Woodlands, and Dunes Class<sup>81</sup>

In Virginia, which has higher mountain elevations than Maryland, the following Classes have been identified in the Terrestrial System:

by an organization called “NatureServe Network.” See *Ecological Classifications*, NATURESERVE, <http://explorer.natureserve.org/classeco.htm> [<https://perma.cc/3K6U-7ZHM>].

70. See *Standards & Methods*, NATURESERVE <http://www.natureserve.org/conservation-tools/standards-methods> [<https://perma.cc/2D23-DEJC>]. The stated mission of NatureServe is “to provide the scientific basis for effective conservation action.” *Mission & Vision*, NATURESERVE, <http://www.natureserve.org/about-us/mission-and-vision> [<https://perma.cc/E5WU-7FM4>]. The “NatureServe Explorer” is a searchable online database that provides extensive information on terrestrial and marine ecological communities. See NATURESERVE, *supra* note 69.

71. See *The Natural Communities of Virginia Classification of Ecological Groups and Community Types*, VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION (April 2017), <http://www.dcr.virginia.gov/natural-heritage/natural-communities/ncintro> [<https://perma.cc/P54V-EGT6>].

72. See generally FLEMING & PATTERSON, *supra* note 68, at i.

73. See JASON W. HARRISON, MARYLAND DEP’T OF NATURAL RES., *THE NATURAL COMMUNITIES OF MARYLAND: 2016 NATURAL COMMUNITY CLASSIFICATION FRAMEWORK* (2016), [http://dnr.maryland.gov/wildlife/Documents/Natural\\_Communities%20Maryland\\_2016\\_Framework.pdf](http://dnr.maryland.gov/wildlife/Documents/Natural_Communities%20Maryland_2016_Framework.pdf) [<https://perma.cc/C2XA-ZYX4>].

74. As with most scientific work, classification frameworks are ongoing processes that are continuously being refined. *Id.* at 7; see also Patrick Comer, Don Faber-Langendoen, et al., *Ecological Systems of the United States: A Working Classification of U.S. Terrestrial Systems*, NATURESERVE 3 (2003) (“[e]cological classifications . . . should be viewed as an ongoing process of stating assumptions, data gathering, data analysis and synthesis, testing new knowledge through field application, and classification refinement. A classification system provides a framework for this ongoing process and the resulting classification should continually change as new knowledge is gained.”). In a litigation context, identification of the DNE proxy would use the most current and verifiable information available.

75. See FLEMING & PATTERSON, *supra* note 68, at i; HARRISON, *supra* note 73, at 8.

76. HARRISON, *supra* note 73, at 8; see also FLEMING & PATTERSON, *supra* note 68, at i.

77. HARRISON, *supra* note 73, at 8.

78. *Id.*; see also FLEMING & PATTERSON, *supra* note 68, at i.

79. HARRISON, *supra* note 73, at 8; see also FLEMING & PATTERSON, *supra* note 68, at i.

80. HARRISON, *supra* note 73, at 9 (“These classes are not necessarily mutually exclusive, but serve to group physiographically and topographically related community groups, which often co-occur on the landscape.”); see also FLEMING & PATTERSON, *supra* note 68, at i. Nonetheless, each of these Classes (whether defined in Virginia or Maryland) can be described. The Mesic Forest Class identified in Maryland within the Terrestrial System, for example, consists of “diverse forests with moist, well-drained soils regimes often supporting lush vegetation. A variety of groups comprise this class which range from northern hardwoods at higher elevations in the mountains to basic mesic forests of the coastal plain.” HARRISON, *supra* note 73, at 10. The High-Elevation Forests, Grasslands, and Rock Outcrops Class identified in Virginia within the Terrestrial System, alternatively, consist of “[e]cological community groups with distributions generally centered above 1,070 m (3,500 ft) elevation (above 3200 ft on the Northern Blue Ridge) and represent[] structurally and compositionally diverse vegetation rich in northern species.” See FLEMING & PATTERSON, *supra* note 68, at ii.

81. HARRISON, *supra* note 73, at 10.

- High-Elevation Forests, Grasslands, and Rock Outcrops
- Low-Elevation Mesic Forests
- Low-Elevation Dry and Dry-Mesic Forests
- Low-Elevation Woodlands, Barrens, and Rock Outcrops
- Maritime Zone Communities
- Sandy Woodlands of the Inner Coastal Plain and Outer Piedmont<sup>82</sup>

Within each Class are Ecological Community Groups, which are “aggregations of finer-level community types that are based on various combinations of topographic, edaphic, physiognomic, and gross floristic similarities.”<sup>83</sup> Two examples of Ecological Community Groups found in Maryland are “northern hardwood forest,” and “maritime swamp.”<sup>84</sup> Natural communities defined at this level (considered a “relatively coarse scale”) are usually more appropriate for “applications such as ecological modeling and vegetation mapping.”<sup>85</sup>

Finally, embedded within each of the Ecological Community Groups are the finer-level Ecological Community Types. Each Ecological Community Type is representative of plant communities because plants “are more easily studied, measured, and are often sensitive to physical and biological factors influencing many types of organisms.”<sup>86</sup> “Plant species are faithful indicators of site conditions, and plant species collectively (i.e. vegetation) reflect the biological and ecological patterns across landscapes.”<sup>87</sup> Thus, plants are commonly used as surrogates to characterize and define ecological communities.<sup>88</sup> Moreover, “since plant communities often correspond closely to distinct assemblages of other types of organisms, natural communities can be used as ‘coarse filters’ that ‘capture’ many of the species and processes in the community even if they have not been specifically identified.”<sup>89</sup> Ecological Community Type is the level “at which community inventory and conservation action are aimed and, as such, it is the level at which community occurrences are tracked and for which conservation status ranks are assigned.”<sup>90</sup>

Ecological Community Type is likely—although not necessarily—the appropriate scale for identifying nature’s DNE proxies since this level of classification lends itself to easy interpretation and can be applied on a site-by-site basis. Additionally, Ecological Communities can be cross-referenced with other applicable classification frameworks. If the DNE proxy is located in the Northeast United States, for example, the “Northeast Terrestrial Wildlife Habitat Classification System” can provide additional information (focused on wildlife habitat)<sup>91</sup> to describe the DNE proxy. The Appendix to this Article provides hypothetical case studies to demonstrate how one or more classification approaches can be used to implement the DNE proxy mechanism.

## B. Parameters for Describing the DNE and the Injury

Science recognizes that there are challenges in identifying and describing ecosystems. For example, “no classification system can perfectly reflect community diversity in the landscape; the data available for classification vary in quantity and quality depending on the community being defined.”<sup>92</sup> As a complement to the classification approach, the delineation and description of a DNE proxy might therefore benefit from the application of some of the concepts and methods underlying a “generic risk assessment protocol” proposed for an IUCN Red List of Ecosystems.<sup>93</sup>

Specifically, once a threatened natural ecosystem is identified and named through one or more classification approaches, a pragmatic “operational definition”

82. FLEMING & PATTERSON, *supra* note 68, at ii.

83. FLEMING & PATTERSON, *supra* note 68, at iii; *see also* HARRISON, *supra* note 73, at 9.

84. HARRISON, *supra* note 73, at 9.

85. FLEMING & PATTERSON, *supra* note 68 at iii.

86. HARRISON, *supra* note 73, at 11.

87. *See The Natural Communities of Virginia Classification of Ecological Groups and Community Types*, VA. DEPT OF CONSERVATION AND RECREATION (Oct. 30, 2017), <http://www.dcr.virginia.gov/natural-heritage/natural-communities/ncintro> [https://perma.cc/P54V-EGT6].

88. *Id.*

89. SPERDUTO & NICHOLS, *supra* note 62, at 9.

90. FLEMING & PATTERSON, *supra* note 68, at iii. In Virginia’s Natural Communities Classification, “[e]ach community type is crosswalked to the equivalent (or nearest equivalent) unit (i.e. the ‘association’) in the United States National Vegetation Classification (USNVC). . . . Associations have a code that begins with the string ‘CEGL’ (Community Element GLobal) [sic] followed by a unique 6-digit number. Community Types that are not defined in the USNVC are listed as ‘no equivalent’ in this field. Each USNVC code in the list is hyperlinked to the corresponding association description on *NatureServe Explorer* website (NatureServe 2017).” FLEMING & PATTERSON, *supra* note 68, at v; *see also* HARRISON, *supra* note 73, at 13-30 (providing hyperlinks for Maryland’s Natural Community Types).

91. *See* S. C. GAWLER, NATURESERVE, NORTHEASTERN TERRESTRIAL WILDLIFE HABITAT CLASSIFICATION 102 (2008), [https://rcngrants.org/sites/default/files/final\\_reports/NE%20Terrestrial%20Wildlife%20Habitat%20Classification%20Final%20Report%20AND%20User%20Guide.pdf](https://rcngrants.org/sites/default/files/final_reports/NE%20Terrestrial%20Wildlife%20Habitat%20Classification%20Final%20Report%20AND%20User%20Guide.pdf) [https://perma.cc/J4FK-B67F]. NETHCS “is a flexible framework for characterizing wildlife habitat that works on two levels—habitat systems and structural modifiers.” *Id.* at 15 (emphasis omitted). The habitat system corresponds to NatureServe’s Ecological Systems. *Id.*; *see also* PATRICK COMER, NATURESERVE, ECOLOGICAL SYSTEM OF THE UNITED STATES: A WORKING CLASSIFICATION OF U.S. TERRESTRIAL SYSTEMS (2003), <http://www.natureserve.org/library/usEcologicalsystems.pdf> [https://perma.cc/J3ND-LAWC]. A terrestrial ecological system “is defined as a group of plant community types that tend to co-occur within landscapes with similar ecological processes, substrates, and/or environmental gradients. A given terrestrial ecological system will typically manifest itself at intermediate geographic scales of 10s to 1,000s of hectares and persist for 50 or more years.” *Id.* at 10. This classification framework is “modular” (instead of hierarchical) but is linked to both the vegetation hierarchy of the NVC discussed above and the “landscape ecosystem hierarchy of ECOMAP” by the USDA Forest Service. *Id.* at 17.

92. SPERDUTO & NICHOLS, *supra* note 62, at 10. In fact, a “classification confidence ranking system has been devised “to indicate the relative robustness of data supporting community concepts and descriptions.” *Id.*; *see, e.g., NatureServe Explorer: An Online Encyclopedia of Life*, NATURESERVE [hereinafter *NatureServe Explorer Ecological Association Comprehensive Report*], <http://explorer.natureserve.org> [https://perma.cc/59Y3-FVFQ] (last visited June 23, 2017).

93. *See* David A. Keith et al., *Scientific Foundations for an IUCN Red List of Ecosystems*, 8 PLOS ONE e62111, at 2-3 (2013), <https://doi.org/10.1371/journal.pone.0062111> [https://perma.cc/APU5-DPP6] (stating “[o]ur purpose here is to develop a robust and generic risk assessment method that can be applied to any internally consistent classification of ecosystems. A generic risk assessment protocol requires clearly defined assessment units, yet it also requires flexibility to assess risks across contrasting ecosystems that vary greatly in biological and environmental characteristics, as well as scales of organisation, and for which varying levels of knowledge are available.”).

that addresses the natural ecosystem's four fundamental aspects—"characteristic native biota, abiotic features, characteristic processes, and the physical space in which these operate"<sup>94</sup>—could be used to delineate and describe both the DNE proxy and the injury it faces. Importantly, the level of specificity used to describe each of these four aspects need not be exhaustive. The goal would be to provide enough verifiable information to demonstrate the DNE proxy's "uniqueness in composition and processes"<sup>95</sup> and its spatial boundaries while addressing how the challenged action has (or imminently will) injure each of the DNE's fundamental elements.

Consistent with this concept is the notion that nature's DNE proxies would be limited to *natural* ecosystems that exhibit minimal human modification or those that have recovered from past human disruption under mainly natural conditions and native species interactions.<sup>96</sup> Thus, ecosystems identified as "early-successional that have experienced recent disturbance or highly modified habitats such as fields and plantation forests that are artificially maintained in an arrested stage of succession"<sup>97</sup> would not qualify as nature's proxy under this Article's proposal. This exclusion, however, does not foreclose the possibility that such ecosystems may in the future "develop into natural systems given sufficient time and freedom from further anthropogenic disturbance."<sup>98</sup>

### C. Establishing Nature's DNE Proxy in the Courtroom

Instead of the legal acrobatics currently required when individuals or environmental groups seek judicial action to protect nature, the most current and verifiable scientific methods, frameworks and technology can be used to identify and then delineate the natural ecosystem that is adversely affected.<sup>99</sup> In essence, the DNE proxy mechanism is tailored to identify the plaintiff that meets all of the Court's Article III standing requirements for each case.<sup>100</sup>

#### Federal Rule of Evidence Rule 702. Testimony by Expert Witnesses

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:

- (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
- (b) the testimony is based on sufficient facts or data;
- (c) the testimony is the product of reliable principles and methods; and
- (d) the expert has reliably applied the principles and methods to the facts of the case.

For example, if faced with a factual scenario like that of *Sierra Club v. Morton*, science-based classification approaches could identify the DNE plaintiff(s) and application of an operational definition would delineate and describe each DNE plaintiff and the injury it faces within the framework of a natural ecosystem's four fundamental elements. Finally, GIS technology could provide a map demonstrating numerous data layers of information regarding the fundamental aspects of the DNE proxy, including its spatial boundaries.

*But who files the suit and how will this work in an actual case?*

Just as litigation attorneys regularly are hired to represent other juristic persons such as corporations, litigation attorneys would be hired to represent the DNE proxy. The attorneys need not be scientists themselves because, as in other litigation contexts, the lawyers can work with one or more qualified expert witnesses.<sup>101</sup> For instance, an attorney representing an injured person in a medical malpractice case works with one or more qualified medical expert witnesses to conduct the necessary physical examinations, submit reports to the court, and testify when necessary.<sup>102</sup> Similarly, the attorney retained to challenge the permits issued to convert a natural forest ecosystem to a ski resort and highway, as in *Sierra Club v. Morton*, would work with qualified expert witnesses, such as biologists and ecologists, to identify and delineate the DNE proxy/proxies and to describe the concrete and particularized injury facing the DNE(s) that would be proximately caused by the permitted recreational "development" of the DNE(s)' forests.<sup>103</sup>

94. *Id.* at app. S1.

95. *See id.* at 4.

96. *See, e.g., The Natural Communities of Virginia Classification of Ecological Groups and Community Types*, VA. DEPT OF CONSERVATION AND RECREATION (June 10, 2017), <http://www.dcr.virginia.gov/natural-heritage/natural-communities/ncintro> [<https://perma.cc/P54V-EGT6>].

97. *Id.*

98. *Id.*

99. It is possible (and perhaps likely) that more than one natural ecosystem faces or has sustained harm. If so, then nature would have more than one DNE proxy. Each DNE would be identified and delineated as described above. Having more than one DNE plaintiff should not be cause for concern as there is often more than one corporation or industry association in suits involving EPA actions and implementation of environmental laws. *See, e.g., Chevron U.S.A., Inc. v. Nat. Res. Def. Council, Inc.*, 467 U.S. 837, 841 n.4 (1984) (Chevron U.S.A. Inc., the American Iron and Steel Institute, the American Petroleum Institute, the Chemical Manufacturers Association, Inc., General Motors Corporation, and the Rubber Manufacturers Association all granted leave to intervene and argue in support of and EPA industry-friendly regulation); *see also Massachusetts v. EPA*, 549 U.S. 497 (2007) (States, local governments, and a group of environmental organizations petitioned for review of an order of EPA).

100. This Article advocates for nature's legal rights (via the DNE proxy mechanism) to seek judicial action in the hopes of avoiding or stopping injury it faces or has sustained.

101. Expert scientific testimony would be proffered under Federal Rule of Evidence 702, and the trial judge, pursuant to Rule 104(a), must make a preliminary assessment of whether the testimony's underlying reason or methodology is scientifically valid and properly can be applied to facts in the case. *See generally* Daubert v. Merrell Dow Pharms., Inc., 509 U.S. 579, 592-93 (1993).

102. *See B. Sonny Bal, The Expert Witness in Medical Malpractice Litigation*, 467(2) CLINICAL ORTHOPEDICS & RELATED RES. 383, 384 (2009), [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2628518/pdf/11999\\_2008\\_Article\\_634.pdf](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2628518/pdf/11999_2008_Article_634.pdf) ("Under [Federal Rule of Evidence] 702, expert witness testimony is almost always required in medical malpractice cases to assist juries in reaching an informed decision. Typically, a plaintiff hires a medical expert to show both a breach of the standard of care and causation, and a defendant hires an opposing expert to show the physician's conduct met the standard of care and/or the breach did not directly or proximately cause injury to the plaintiff.").

103. *See Babcock, supra* note 3, at 46 (suggesting that use of expert testimony is admissible only if the trial judge determines the underlying reason or

In *Daubert v. Merrell Dow Pharmaceuticals, Inc.*,<sup>104</sup> the Supreme Court established a non-exclusive checklist for trial courts to use in assessing the reliability of scientific expert testimony. The key factors include the following:

1. whether the expert's technique or theory can be or has been tested—that is, whether the expert's theory can be challenged in some objective sense, or whether it is instead simply a subjective, conclusory approach that cannot reasonably be assessed for reliability;
2. whether the technique or theory has been subject to peer review and publication; the known or potential rate of error of the technique or theory when applied; the existence and maintenance of standards and controls; and
3. whether the technique or theory has been generally accepted in the scientific community.<sup>105</sup>

The use of a DNE proxy to establish nature's legal personhood and right to exist and defend itself would be novel. The underlying information, methods, technology, standards and frameworks, however, are not; this work is the subject of objective, verifiable peer-reviewed publications, and studies and projects that adhere to rigorous standards and controls.<sup>106</sup> The "novelty" is limited to the context in which this work now could be applied.<sup>107</sup>

Thus, a DNE proxy, seeking to protect itself from direct and imminent injury, could oppose the agency that issued the permit, as well as the company or companies seeking to build the resort and highway. This action "preserves the vitality of the adversarial process by assuring both that the parties before the court have an actual, as opposed to professed, stake in the outcome, and that the legal questions presented . . . will be resolved, not in the rarified atmosphere of a debating society, but in a concrete factual context condu-

cive to a realistic appreciation of the consequences of judicial action."<sup>108</sup> In this instance, Nature's DNE proxy is fighting for its continued existence against the permitting government agency and the development company that seek to end the DNE's existence.

*But demonstrating harm to nature is easy—won't this flood the courts with challenges to every human or corporate act that impacts nature?*

As Professor Babcock points out, "perhaps the problem is less that nature cannot demonstrate actual or threatened injury, and more that it may be very easy for nature to make these showings . . . [which may] enable[e] a multitude of otherwise dubious claims to reach the courts."<sup>109</sup> One previously suggested way to avoid this problem is to limit claims on behalf of nature more generally to those involving "important and/or irreplaceable natural resources put in jeopardy by government inaction."<sup>110</sup> Others such as Professor Christopher Stone have suggested, as early as 1972, that a constitutional list of "preferred objects" be created.<sup>111</sup>

This Article suggests that each and every one of nature's natural functioning ecosystems threatened with or suffering harm (at the hands of government, corporations, or other persons) should be provided the opportunity to defend its right to exist through the DNE mechanism. This would not be unmanageable. The DNE proxy mechanism inherently filters out dubious claims because establishment of each DNE proxy and the harm it faces or has sustained requires application of verifiable scientific methods and data by way of expert witness evidence that passes muster under the *Daubert* standard. The DNE proxy also preempts and avoids claims by individual constituents of the natural ecosystem because the DNE proxy acts as an umbrella for its "characteristic native biota; abiotic environment, key processes and interactions; and spatial distribution."<sup>112</sup> The DNE proxy comprehensively represents nature's interests to exist and thrive in a given geographical area. Finally, DNE proxies are limited to *natural* ecosystems that exhibit minimal human modification or those that have recovered from past human disruption under mainly natural conditions and native species interactions.

In accord with all of the Court's precedent on Article III standing, nature's proxy in the form of the DNE plaintiff would be the party that demonstrates concrete, particularized<sup>113</sup> or distinct and palpable<sup>114</sup> injury—the one with a direct stake in the outcome<sup>115</sup>—that can be redressed by court action when nature is facing or has suffered harm. In acknowledging the right of nature to stand—within the existing rigorous Article III inquiry precedent and the well-established doctrine of "juristic personhood"—the courts will take a significant step toward realization of the purpose

---

methodology is scientifically valid and can properly be applied to the facts in the case to achieve the same result).

104. See *Daubert*, 509 U.S. at 593-95.

105. *Id.* at 592-95.

106. For example, the NVC, which underpins many other classification systems, was developed and implemented by The Nature Conservancy in the 1990s. Since 2001, NatureServe has continued to develop, maintain and implement it, "working with the network of Natural Heritage Programs and U.S. Federal Agencies, in conjunction with the Vegetation Panel of the Ecological Society of America and the Federal Geographic Data Committee." The NVC "is a jurisdictional subset of the larger International Vegetation Classification of Ecological Communities (IVC), which is maintained by NatureServe in an institutional database. The North American units of the IVC are posted online via NatureServe Explorer. The USNVC's two finest levels, the Alliance and Association, are maintained through the USNVC review board to ensure consistent definitions. Proposed revisions are reviewed both locally and nationally and changes are published in the Proceedings of the U.S. National Vegetation Classification." FLEMING & PATTERSON, *supra* note 68, at iii; see also *Standards & Methods*, NATURESERVE (Oct. 30, 2017 9:00 PM), <http://www.natureserve.org/conservation-tools/standards-methods> [https://perma.cc/2D23-DEJC] ("The key to creating interoperability among the more than 80 local programs that comprise the NatureServe Network is use of a rigorous set of field and data management standards and protocols. These standards and protocols are known collectively as natural heritage methodology, and serve as a common language for all participants in the Network.")

107. Moreover, this Article suggests that models for ecosystem integrity assessments and generic risk assessments of ecosystems might be comparable to the proposed DNE proxy mechanism.

108. *Lujan v. Defs. of Wildlife ("Lujan II")*, 504 U.S. 555, 581 (1992) (internal citations omitted).

109. Babcock, *supra* note 3, at 45.

110. *Id.* at 45-46.

111. Stone, *supra* note 6, at 486.

112. See Keith et al., *supra* note 93, at app. S1.

113. See *Lujan v. Defs. of Wildlife ("Lujan II")*, 504 U.S. 555, 560-61 (1992).

114. See *Warth v. Seldin*, 422 U.S. 490, 501 (1975).

115. See *Sierra Club v. Morton*, 405 U.S. 727, 740 (1972).

behind the National Environmental Policy Act.<sup>116</sup> It will enable the formation of a national policy designed to encourage “harmony between man and his environment” and to “promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man” while “enrich[ing] the understanding of the ecological systems and natural resources important to the Nation.”<sup>117</sup>

## V. A Cautionary Point: Human Needs Cannot Define the DNE

The fact that human health depends very much on the health of nature cannot justify the subjugation of nature. Again putting aside the moral considerations with respect to our relationship with nature, under even the strictest utilitarian view we must recognize that in order to protect human health and survival, humans must be willing to put nature—in its *natural functioning state*—first to evaluate human impact on nature. This requires us to accept that while humans are part of nature, humans do not define it.<sup>118</sup> In the process of recognizing a DNE as a “legal person,” we cannot define or measure the DNE entity in terms of human needs or actions. The simple reason is that even catastrophic harm to an ecosystem has been justified when cast in terms of short-term economic needs.

For example, approval of an unsustainable timber harvest in a National Forest can be—and has been—rationalized by the recognition that:

The Forest Service does not manage ecosystems just for the sake of managing them or for some notion on intrinsic ecosystem values . . . For the Forest Service, ecosystem management means to . . . produce *desired resource values, uses, products or services* in ways that also sustain the diversity and productivity of ecosystems.<sup>119</sup>

Notably, nature comes last in that analysis.<sup>120</sup> Likewise, under the Endangered Species Act, the U.S. Fish and Wildlife Service (“USFWS”) does not designate “critical habitat” for an Endangered Species *until it takes “into consideration the probable economic and other impacts of the designation.”*<sup>121</sup>

116. 42 U.S.C. § 4321 (2012).

117. *Id.*

118. See Oliver A. Houck, *Are Humans Part of Ecosystems?*, 28 ENVTL. L. 1, 6 (1998).

119. *Id.* at 8 (emphasis added) (quoting *Krichbaum v. Kelley*, 844 F. Supp. 1107, 1115 (W.D. Va. 1994), *aff’d*, 61 F. 3d 900 (4th Cir. 1995)).

120. As Justice Douglas observed in his *Sierra Club* dissent, “[T]he problem is to make certain that the inanimate objects, which are the very core of America’s beauty, have spokesmen before they are destroyed. It is, of course, true that most of them are under the control of a federal or state agency. The standards given those agencies are usually expressed in terms of the ‘public interest.’ Yet ‘public interest’ has so many differing shades of meaning as to be quite meaningless on the environment front . . . The federal agencies of which I speak . . . are notoriously under the control of powerful interests who manipulate them through advisory committees, or friendly working relations, or who have that natural affinity with the agency which in time develops between the regulator and the regulated.” *Sierra Club v. Morton*, 405 U.S. 727, 745-46 (1972) (Douglas, J., dissenting).

121. See *Critical Habitat Under the Endangered Species Act*, U.S. FISH & WILDLIFE SERV. S.E. REG’L OFFICE, <https://www.fws.gov/southeast/endangered-species-act/critical-habitat> [https://perma.cc/4AEH-YDQJ] (emphasis added).

In fact, according to USFWS, “an area may be excluded from critical habitat designation based on any of the following: *economic impact*, impact on national security,” or “any other relevant impact, if the Service determine[s] that the benefits of excluding it outweigh the benefits of including it, unless failure to designate the area a critical habitat may lead to extinction of the species.”<sup>122</sup>

The destructive practice of mining coal by clearing Appalachian forests, blasting off ancient mountain tops containing globally significant levels of biodiversity and filling in the mountain valley streams is economically justifiable even when human mortality and morbidity is linked to these practices.<sup>123</sup> Another current example is the death of the Great Barrier Reef. In human terms, advocates in favor of protection of the Reef might argue that if the Reef dies, \$6 billion in tourist revenue and the ability of future generations to enjoy the Reef would be lost.<sup>124</sup> However, as André Dao points out, “such arguments invite the rebuttals that have in fact been used: the value of the coal that is to be transported through the reef, the need to provide power to countries around the world and, above all, the importance of unending economic growth.”<sup>125</sup>

If we see nature as valuable only through the lens of its “usefulness” to humanity, the cost of nature’s destruction will almost always be justifiable.<sup>126</sup>

## APPENDIX

The following two hypothetical case studies are illustrative of how the DNE proxy mechanism could be employed in a manageable and verifiable manner. Neither of these hypothetical case studies, however, are intended to be an exhaustive breakdown of the available legal claims or the science and technology that could be deployed in support of a DNE proxy or proxies facing imminent harm.

### *Hypothetical Case Study No. 1: Sierra Club v. Morton Redux in the Central Appalachian Mountains of the Eastern United States.*

The National Forest Service has just approved permits for a ski resort to be built in Mineral Queen National Forest (“National Forest”).<sup>127</sup> As part of the plan for which the permits have been approved, a highway will cut through the National Forest and 2,000 contiguous acres of the forest will

122. *Id.* (emphasis added). When existing environmental laws and regulations fail to adequately protect nature, common law tort claims should be available to nature to protect itself from harm.

123. See generally CLAUDIA COPELAND, CONG. RESEARCH SERV., RS21421, MOUNTAINTOP MINING: BACKGROUND ON CURRENT CONTROVERSIES 1, 3-4 (2015), <https://fas.org/sgp/crs/misc/RS21421.pdf>; see also James Wickham et al., *The Overlooked Terrestrial Impacts of Mountaintop Mining*, 63 BIOSCIENCE MAG. 335, 345 (2015), <https://academic.oup.com/bioscience/article/63/5/335/229211/The-Overlooked-Terrestrial-Impacts-of-Mountaintop>.

124. See Dao, *supra* note 5, at 65, 66.

125. *Id.*

126. *Id.*

127. Mineral Queen National Forest is a fiction created to loosely track the facts in *Sierra Club v. Morton*.

be converted to open land for development of hotels, a conference center, and ski slopes with the attendant infrastructure.

Just as attorneys might act on behalf of non-human entities such as corporations, attorneys here would act on behalf of the impacted DNE proxy,<sup>128</sup> and file suit for a declaratory judgment and injunction to prevent the 2,000 acre deforestation for the extensive ski resort development.

In preparation for the case, a legal team would be assembled including attorneys and scientists (such as forest ecologists, and plant and wildlife biologists) that would identify the appropriate legal proxy for nature. The mountains to be deforested and developed are located in the Maryland portion of the National Forest and are part of the Appalachian Mountain Range. Using biotic and abiotic indicators, such as soil type and moisture, the local climate, distribution of native plant species, the physical characteristics of the land, and the characteristic processes of the ecosystem, the scientists would first need to confirm that the geographic area facing injury is a natural ecosystem exhibiting little human disturbance. This first step might also involve using Maryland's Natural Community Classification approach to identify the Ecological Community Type:

System: Terrestrial

Class: Mesic Forest characterized by moist, well-drained soils regimes supporting lush vegetation.

Ecological Community Group: Rich Cove Forest

Ecological Community Type: Central Appalachian Rich Cove Forest<sup>129</sup>

Scientists would not be limited to use of a state heritage Natural Community classification; additional resources might include NatureServe's Ecological Systems classification approach, Maryland's Key Wildlife Habitats,<sup>130</sup> and different levels of on-site assessment data from field sampling. Applying an operational definition of the natural ecosystem would describe the fundamental elements that distinguish and define the DNE proxy and the distinct harm it faces in this case. The DNE's unique native biota, its abiotic complex, and its key processes and interactions might be described as follows:

The DNE is "characterized by diverse, mesic forests of mountain slopes occupying sheltered landforms such as coves, ravines, and concave lower slopes. These landforms

provide shade, protection from high winds, and lend to very moist soil conditions."<sup>131</sup>

The DNE "contains deep, fertile soils weathered from a variety of substrates that have high levels of calcium, magnesium, and manganese. Soils are moderately alkaline and support very diverse and lush herbaceous layers."<sup>132</sup> The characteristic canopy is dominated by Sugar Maple, American Basswood, White Ash, and Tuliptree, while the herbaceous layer is diverse and typically includes aniseroot, wild ginger, white snakeroot and wild columbine.<sup>133</sup> The DNE proxy is habitat for a number of species of concern, including Allegheny woodrat, Bobcat, North American porcupine, Eastern red bat, American woodcock, Golden eagle, Mountain chorus frog, Wood turtle, and Sanderson's bumble bee.<sup>134</sup> Also noted is that the diversity of this DNE proxy is one of the richest in this area of the United States.<sup>135</sup>

The expert reports filed with this information would also include the spatial boundaries in which the DNE proxy operates. GIS mapping polygons could illustrate the DNE proxy boundaries, location (latitude and longitude coordinates) and the unique characteristics of the DNE proxy in data layers.

Removal of the forest and converting it to an extensive ski resort will destroy 2,000 contiguous acres of trees. As demonstrated below, the identification and description of the appropriate DNE as the "legal person" proxy for nature reveals, with a new level of clarity, that the challenged action will destroy not "just" trees, but a naturally functioning and intact Central Appalachian Rich Cove Forest ecosystem which in turn has cumulative and far-reaching effects.

Applying the law in a scientific context, reveals that the *Plaintiff Central Appalachian Rich Cove Forest DNE [latitude/longitude coordinates for GIS polygon/boundary lines]* meets each element of the standing test:

**First, the plaintiff must have suffered an "injury in fact."** Injury in fact must consist of an invasion of a legally-protected interest which is (a) concrete and particularized, and (b) "actual or imminent, not 'conjectural'" or "hypothetical."<sup>136</sup>

Invasion of a legally protected interest: Plaintiff seeks a declaratory judgment and injunction to restrain federal officials from allowing an extensive ski development to destroy

128. It is possible that the forest conversion and the development will injure more than one DNE proxy. If that is the case, each DNE proxy would join in the action. To keep the hypothetical simple, this case study assumes that only one DNE proxy faces injury.

129. See HARRISON, *supra* note 73, at 13. The Unique Identifier code assigned to this community type is: CEGL006237. See also *NatureServe Explorer Ecological Association Comprehensive Report*, *supra* note 92.

130. MD. DEP'T OF NAT. RES., MARYLAND STATE WILDLIFE ACTION PLAN: 2015-2025, at 4-2 (2015) [hereinafter *MD Key Wildlife Habitats*]. "Many [Maryland] key wildlife habitats have a direct ecological relationship with and are equivalent to certain levels in the Maryland Natural Community Classification . . . Recognizing the need for regional context, however, Maryland's key wildlife habitats are defined so as to be equivalent to and directly compatible with NatureServe's ecological systems which form the basic classification scale of the Northeastern Terrestrial Wildlife Habitat Classification System (NETHCS)."

131. *Id.* at 4-16; HARRISON, *supra* note 73, at 11; *Acer Saccharum—Fraxinus Americana—Tilia Americana—Liriodendron Tulipifera/Actaea Racemosa Forest*, NATURESERVE (2017), [http://explorer.natureserve.org/servlet/NatureServe?searchCommunityUid=ELEMENT\\_GLOBAL.2.687966](http://explorer.natureserve.org/servlet/NatureServe?searchCommunityUid=ELEMENT_GLOBAL.2.687966) (last visited June 14, 2017).

132. See *MD Key Wildlife Habitats*, *supra* note 130, at 4-16.

133. See *id.* at 4-17; see also *NatureServe Explorer Ecological Association Comprehensive Report*, *supra* note 92.

134. See *MD Key Wildlife Habitats*, *supra* note 130, at 4-18.

135. See *id.* at 16.

136. See, e.g., *Lujan v. Defs. of Wildlife ("Lujan II")*, 504 U.S. 555, 560-61 (1992) (citing *Allen v. Wright*, 468 U.S. 737, 756 (1984)); *Los Angeles v. Lyons*, 461 U.S. 95, 102 (1983); *Simon v. Eastern Kentucky Welfare Rights Org.*, 426 U.S. 26, 38, 41-43 (1976); *Warth v. Seldin*, 422 U.S. 490, 508 (1975); *Sierra Club v. Morton*, 405 U.S. 727, 740-41 n.16 (1972).

it. Plaintiff's attorneys rely on § 10 of the Administrative Procedure Act ("APA"), which accords judicial review to a "person suffering legal wrong because of agency action, or [who is] adversely affected or aggrieved by agency action within the meaning of a relevant statute."<sup>137</sup> Plaintiff—through its attorneys—alleges that the proposed development contravenes federal laws and regulations governing the preservation of National Forests<sup>138</sup> and the National Environmental Policy Act ("NEPA").<sup>139</sup>

In *Association of Data Processing Service Organizations, Inc. v. Camp* and *Barlow v. Collins*, the Court held that persons had standing to obtain judicial review of federal agency action under § 10 of the APA where they had alleged that the challenged action had caused them "injury in fact," and where the alleged injury was to an interest "arguably within the zone of interests to be protected or regulated" by the statutes that the agencies were claimed to have violated.<sup>140</sup> One of the fundamental characteristics of the Plaintiff is that it is a forest that is located within a national forest. The National Forest Management Act applies to forests in national forests. Plaintiff is facing destruction and therefore is within the "zone of interests" of the National Forest Management Act.<sup>141</sup>

#### Injury in fact that is concrete and particularized:

The expert testimony proffered demonstrates that the deforestation and development of 2,000 acres of Plaintiff into an extensive ski resort will result in a number of injuries, including:

137. Administrative Procedure Act, 5 U.S.C. §§ 702, 704 (2012). Actually, given the 2,000 acres of forests that face elimination and the habitat associated with this particular DNE, the DNE attorneys would have sought relief under the citizen suit provisions of the Endangered Species Act, 16 U.S.C. § 1540(g) (2012), the Clean Air Act, 42 U.S.C. §§ 7604, 7607 (2012) and the Clean Water Act, 33 U.S.C. § 1365(g) (2012) instead of the APA. This hypothetical is using the APA to conform to the *Sierra Club v. Morton* framework.
138. National Forest Management Act of 1976, 16 U.S.C. §§ 1600–14 (2012), requires the Secretary of Agriculture to assess forest lands, develop a management program based on multiple-use, sustained-yield principles, and implement a resource management plan for each unit of the National Forest System. It is the primary statute governing the administration of national forests.
139. 42 U.S.C. §§ 4321–47. NEPA requires Federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. To meet this requirement, Federal agencies must analyze the environmental effects of proposed actions, such as through an environmental impact statement or other method, as specified in applicable rules.
140. *Ass'n of Data Processing Serv. Org. Inc. v. Camp*, 397 U.S. 150 (1970); *Barlow v. Collins*, 397 U.S. 159 (1970).
141. In addition, Plaintiff DNE may have a "procedural injury" if the agency failed to complete an Environmental Impact Statement as required by NEPA. See *Massachusetts v. EPA*, 549 U.S. 497, 517–18 (2007) (stating "when a litigant is vested with a procedural right, that litigant has standing if there is some possibility that the requested relief will prompt the injury-causing party to reconsider the decision that allegedly harmed the litigant"); see also *Sugar Cane Growers Coop. of Fla. v. Veneman*, 289 F.3d 89, 94–95 (D.C. Cir. 2002) ("[A litigant] who alleges a deprivation of a procedural protection to which he is entitled never has to prove that if he had received the procedure the substantive result would have been altered. All that is necessary is to show that the procedural step was connected to the substantive result."). Moreover, if the existing environmental protection laws or agency laws and regulations pertaining to nature (such as the National Forest Management Act), do not offer adequate protection, a claim grounded in tort may provide the avenue through which nature (via its DNE proxy) may prosecute its interest in continued existence.

#### 1. Soil Depletion and Erosion

Intact forest soils are moist and contain nutrients. If Plaintiff's forest cover is removed, the functioning soils will be exposed to the sun's rays; soil moisture and nutrients will evaporate and the bacteria that help break down organic matter will be affected. Eventually, rain will wash down the soil surfaces and erosion takes place.<sup>142</sup>

#### 2. Loss of Canopy and Temperature Regulation

Deforestation will eliminate the forest canopy which acts as a day-time shield from the sun, but retains heat at night. Loss of the forest canopy causes more extreme temperature swings that adversely affect the characteristic native biota within the Plaintiff; Plaintiff loses its forest-created microclimate and its ability to provide its associated plant and animal habitat.<sup>143</sup>

#### 3. Mineral Queen River Watershed (home to native brook trout) Is Greatly Compromised

Currently, the (intact) Plaintiff's forest filters and regulates the flow of rain water. The leafy canopy intercepts precipitation, modulating rain's descent. Plaintiff's forest floor functions as a sponge, and can absorb over a foot of rain before slowly releasing it to streams and recharging ground water.<sup>144</sup>

If Plaintiff's forest canopy is removed and replaced with roads, parking lots, and hotels (impervious surfaces) the impact to the watershed, the river, and receiving streams will be immediate.<sup>145</sup> Increased impervious surface area causes water to run "off the land, traveling on the surface towards the streams. As this 'storm water runoff' travels to the streams it collects pollutants and increases speed."<sup>146</sup> This causes flooding, erosion of stream banks, sediment and pollutant loading, decline in water quality, and loss of habitat for the brook trout and other fish.<sup>147</sup>

#### 4. Loss of Biodiversity

If Plaintiff is destroyed, a rich area of biodiversity will be lost.<sup>148</sup> Deforestation and the extensive ski resort development will result in loss of habitat of innumerable species. On site assessment, remote sensing imagery data, and information from recent biologic surveys that would be analyzed by the Plaintiff's forest ecologist and biologist expert witnesses would confirm the following:

142. See William J. Elliot et al., *The Effects of Forest Management on Erosion and Soil Productivity*, U.S. FOREST SERV. (July 7, 1996), [https://forest.moscowfsl.wsu.edu/smp/docs/docs/Elliot\\_1-57444-100-0.html](https://forest.moscowfsl.wsu.edu/smp/docs/docs/Elliot_1-57444-100-0.html); see also *Deforestation*, NAT'L GEOGRAPHIC (2015), <http://www.nationalgeographic.com/environment/global-warming/deforestation/>.
143. *Deforestation*, *supra* note 142.
144. See Vincent Cotrone, *The Role of Trees and Forests in Healthy Watersheds*, PENN STATE EXTENSION (Aug. 25, 2017), <http://extension.psu.edu/plants/green-industry/landscaping/culture/the-role-of-trees-and-forests-in-healthy-watersheds>.
145. *See id.*
146. *See id.*
147. *See id.*
148. *See MD Key Wildlife Habitats*, *supra* note 130, at 4–16.

### *Characteristic Flora*

The tree stands are dominated by sugar maple, basswood, white ash, white oak, and northern red oak.<sup>149</sup> Other identified tree species include shagbark hickory, butternut, black locust, witch-hazel, eastern hop-hornbeam, striped maple, and sweet birch.<sup>150</sup>

The herbaceous layer includes: Jack-in-the-pulpit, white snakeroot, aniseroot, wood nettle, enchanter's nightshade, wild ginger, American ginseng, wild columbine, foamflower, wood-ferns, trilliums, and bellworts.<sup>151</sup>

### *Characteristic Fauna (including animal species identified as those of greatest conservation need)*

Mammals: Allegheny woodrat, American mink, Appalachian cottontail, Big brown bat, Bobcat, Eastern red bat, Eastern spotted skunk, Hoary bat, Least weasel, Long-tailed shrew, North American porcupine, Northern long-eared bat, Golden eagle, Silver-haired bat, Southern bog lemming, Tricolored bat, Southern water shrew, Smoky shrew, Southern pygmy shrew.<sup>152</sup>

Birds: Acadian flycatcher, American redstart, American woodcock, Black-and-white warbler, Blackburnian warbler, Black-throated blue warbler, Black-throated green warbler, Broad-winged hawk, Blue-winged warbler, Dark-eyed junco, Eastern whip-poor-will, Cerulean warbler, Golden-winged warbler, Hooded warbler, Kentucky warbler, Least flycatcher, Northern parula, Northern saw-whet owl, Ruffed grouse, Scarlet tanager, Sharp-shinned hawk and the Veery.<sup>153</sup>

Reptiles: Eastern box turtle, Timber rattlesnake, Wood turtle.<sup>154</sup>

Amphibians: Green salamander, Mountain chorus frog, Jefferson salamander, Upland chorus frog, Valley and Ridge salamander, Wehrle's salamander.<sup>155</sup>

Insects (including Butterflies and Moths): Sanderson's Bumble Bee, American chestnut nepticulid moth, Appalachian blue, Compton tortoiseshell, Hickory hairstreak, Gray comma, Early Hairstreak, Three-horned moth, Phleophagan chestnut nepticulid moth and West Virginia White.<sup>156</sup>

## 5. Greenhouse Gases and Global Warming Increased

Trees and soils help regulate atmospheric temperatures through a process called evapotranspiration. This helps to stabilize the climate.<sup>157</sup> Additionally, forests enrich the atmosphere by absorbing CO<sub>2</sub> and other greenhouse gases and producing oxygen.<sup>158</sup> Trees also help to remove air pollutants.<sup>159</sup> Fewer forests means larger amounts of greenhouse

gases entering the atmosphere—and increased speed and severity of global warming.<sup>160</sup>

The fact that an injunction to prevent destruction and permanent conversion of the Plaintiff to an extensive ski development will protect “only” 2,000 acres of forest, and therefore will have only a marginal effect on the entire world’s greenhouse gases is not relevant. In *Massachusetts v. EPA*,<sup>161</sup> the Supreme Court made clear that although climate risks are “widely shared”<sup>162</sup> and the potential consequences associated with man-made climate change are enormous compared to the effect of the challenged action, the claimant’s interest in avoiding concrete injury was not diminished.<sup>163</sup> Specifically, the court posited, “[the] argument rests on the erroneous assumption that a small incremental step, because it is incremental, can never be attacked in a federal judicial forum. Yet accepting that premise would doom most challenges to regulatory action.”<sup>164</sup>

Injury in fact is actual or imminent: The permits have been issued and a Special Use Authorization has been provided that will allow the clearing and extinguishment of 2,000 acres of the Plaintiff so as to develop the area into an extensive ski resort.

**Second, there must be a causal connection between the injury and the conduct complained of—the injury has to be “fairly. . . trace[able] to the challenged action of the defendant, and not . . . th[e] result [of] the independent action of some third party not before the court.”**<sup>165</sup>

The National Forest Service has issued the permits and provided the Special Use Authorization, which will allow the destruction of the Plaintiff without an Environmental Impact Statement, in violation of the laws governing the National Forests and NEPA.<sup>166</sup> The National Forest Service’s conduct will result in the execution of the deforestation and resort development plans and therefore, Plaintiff’s concrete injury in the form of its destruction.

**“Third, it must be ‘likely,’ as opposed to merely ‘speculative,’ that the injury will be ‘redressed by a favorable decision.’”**<sup>167</sup>

If the court grants the injunction and declaratory relief sought, Plaintiff will avoid destruction. The trees, plants, animals, soil, and water (including the Mineral Queen watershed), will remain intact and will continue to act as a natural functioning ecosystem with natural processes that preserve biodiversity, habitat, land integrity and water and air quality, in addition to acting as a “carbon sink” to reduce greenhouse gases and global warming.

149. *See id.* at 417.

150. *See id.*

151. *See id.*

152. *See id.* at 18.

153. *See id.*

154. *See id.*

155. *See id.*

156. *See id.*

157. *See The Greenhouse Effect*, NAT’L GEOGRAPHIC, <http://environment.nationalgeographic.com/environment/global-warming/gw-overview-interactive> (last visited September 17, 2017).

158. *Id.*

159. *Id.*

160. *Id.*

161. *Massachusetts v. EPA*, 549 U.S. 497 (2007).

162. *Id.* at 522 (quoting *Federal Election Comm’n v. Akins*, 524 U.S. 11, 24 (1998)).

163. *Id.* at 524.

164. *Id.*

165. *Lujan II*, 504 U.S. at 560-61 (quoting *Simon v. Eastern Ky. Welfare Rights Org.*, 426 U.S. 26, 41-42 (1976)).

166. 42 U.S.C. §§ 4321-47.

167. *Lujan II*, 504 U.S. at 560-61.

Does this mean that no ski resorts can ever be built again? No. The result of the Plaintiff DNE proxy prevailing in this case would mean that the courts, the permitting government agencies, the developer, and the public may be made more acutely aware of the very real and far reaching effects of natural ecosystem destruction. The developer of the ski resort can seek another location (one that does not impact a natural ecosystem) or otherwise revise its plans so as to eliminate the possibility of injuring or destroying the Plaintiff.

It would be a victory for both humans and nature.

### *Hypothetical Case Study No.2: Lujan II Redux in Upstate New York*

This hypothetical case study will assume facts that loosely parallel the pertinent facts of *Lujan II*.<sup>168</sup> Hypothetically, the U.S. Government has just approved funding to build a dam in New York State, and the Secretary of Interior has issued the necessary permits for the dam construction to begin.<sup>169</sup> The dam will eliminate wetlands known to be occupied by a colony of federally threatened bog turtles.<sup>170</sup>

Under this Article's proposal, nature's DNE proxy, which seeks declaratory relief and permanent injunction to the construction of the dam, is distinctly different than the *Lujan II* human plaintiffs who traveled to Egypt and Sri Lanka to study and observe endangered animals in their native habitat. Specifically, the Plaintiff is the "juristic person" directly facing the imminent injury: the scientifically based delineated habitat of the federally threatened bog turtles that will be eliminated by the dam. Note that the proxy for nature is a DNE (the bog turtles' habitat), and not the bog turtles themselves. The DNE proxy acts as an umbrella to protect all of the living and nonliving components that function through natural processes within it.<sup>171</sup> Without this functioning wetland ecosystem, the individual bog turtles would not survive. Hence, even under the Endangered Species Act, the "legal person" aspect of nature would be the DNE proxy—the DNE habitat of the endangered or threatened species; not the individual species alone.

In preparation for the case, a legal team would be assembled including attorneys and scientists (such as wetland ecologists, herpetologists, and plant and wildlife biologists) that would

identify the appropriate legal proxy for nature. Using biotic and abiotic indicators, such as soil type and moisture, the local climate, distribution of native plant species, the physical characteristics of the land, and the characteristic processes of the ecosystem, the scientists would first need to confirm that the wetland facing destruction is a natural ecosystem with an extant and viable bog turtle colony. Expert witness testimony from the scientists may use (but need not be limited by) the tools, surveys and research published by the U.S. Fish and Wildlife Service. Applying an operational definition of the natural ecosystem habitat would describe the fundamental elements that distinguish and define the DNE proxy and the distinct harm it faces in this case. Thus, the DNE's unique native biota (including the federally threatened bog turtle), its abiotic complex, and its key processes and interactions might be described as follows:

"Bog turtles inhabit shallow, spring-fed fens, sphagnum bogs, swamps, marshy meadows, and pastures which have soft, muddy bottoms; clear, cool, slowflowing water, often forming a network of rivulets; and open canopies." At only about four inches long, the bog turtle (*Clemmys (Glyptemys) muhlenbergii*) is one of North America's smallest turtles. The bog turtles rely on different portions of the (soon-to-be eliminated) wetland at different times of year to fulfill various needs: The variety of wet and dry places found in this wetland (or "fen") meets all the turtle's basic needs. Sunny open areas provide the warmth needed to regulate the turtle's body temperature and incubate its eggs, while soft muddy areas allow turtles to escape from predators and extreme temperatures.<sup>172</sup>

The wetland at issue is a mapped Element Occurrence for a viable bog turtle colony and is characteristic bog turtle habitat:

1. Suitable hydrology. Bog turtle wetlands are typically spring-fed with shallow surface water or saturated soils present year-round, although in summer the wet area(s) may be restricted to near spring head(s). Typically these wetlands are interspersed with dry and wet pockets . . .
2. Suitable soils. Usually a bottom substrate of permanently saturated organic or mineral soils. These are often soft, mucky-like soils . . .
3. Suitable vegetation. Dominant vegetation of low grasses and sedges. . . .<sup>173</sup>

Using New York State's natural heritage classification approach, and data collected from on-site assessments this specific bog turtle habitat can be identified as a "Marl Fen:"

System: Palustrine

Subsystem: Open Peatlands

Community: Marl Fen<sup>174</sup>

168. See *id.* at 562. To keep the hypothetical as straightforward as possible, the fact that the challenged activities were overseas (and not in the U.S.) is omitted. In addition, funding of a dam and the issuance of permits will be the government action instead of the promulgation of a rule (again, to keep the example straightforward).

169. See *id.* at 562-64 (showing in the actual *Lujan II* case, Plaintiffs' claim to injury was that two of the (human) plaintiffs had traveled to foreign countries and observed endangered animals in their native habitat, and these animals were now threatened with extinction by the action of the U.S. government in financing foreign dam building projects, including the Aswan Dam in Egypt. The Plaintiffs asserted that they intended to go back and would be harmed if the animals were to become extinct).

170. Endangered and Threatened Wildlife and Plants: Final Rule to List the Northern Population of the Bog Turtle as Threatened and the Southern Population as Threatened Due to Similarity of Appearance, 62 Fed. Reg. 59605, 59606 (Nov. 4, 1997) (to be codified at 50 C.F.R. pt. 17).

171. If the USFW has designated "critical habitat" of the listed species the DNE proxy could read "Critical Habitat of Federally Endangered or Threatened Species."

172. See *Bog Turtle (Clemmys Muhlenbergii)*, U.S. FISH & WILDLIFE SERV., <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=C048> (last visited June 17, 2017).

173. U.S. FISH & WILDLIFE SERV., *Guidelines for Bog Turtle Surveys 2* (2006), <https://www.fws.gov/northeast/nyfo/es/btsurvey.pdf>.

174. See G.J. EDINGER ET AL., *ECOLOGICAL COMMUNITIES OF NEW YORK STATE 56* (2d ed. 2014), [http://www.dec.ny.gov/docs/wildlife\\_pdf/ecocomm2014.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/ecocomm2014.pdf).

[This is a] wetland that occurs on a bed of marl. Marl is a whitish substance that is deposited from water that has a lot of calcium dissolved in it. The whitish substance is calcium carbonate, people used to harvest marl to lime agricultural fields. The marl substrate is always saturated, may be flooded, and has a very high pH, generally greater than 7.5. The main source of water is always groundwater. The plants are often sparse and stunted. Marl fens may occur as small patches within a rich graminoid fen.<sup>175</sup> “The dominant species in marl fens are graminoid. Characteristic herbaceous species include yellow sedge, spikerush, twig-rush, beakrush, water-horehound, grass-of-Parnassus, pitcher-plant, hard-stem bulrush, nutrush, Ohio goldenrod, arrow-grass, variegated horsetail, jointed rush, and Kalm’s lobelia.<sup>176</sup>

The expert reports filed with this information would also include the spatial boundaries in which the DNE proxy operates. GIS mapping polygons could illustrate the boundaries, location and unique characteristics of the DNE proxy in data layers. Applying the law in a scientific context reveals that the *Plaintiff Marl Fen, Habitat of Federally Threatened Bog Turtles, [latitude/longitude coordinates for the GIS polygon]* meets each element of the standing test:

**First, the plaintiff must have suffered an injury in fact.**

Injury in fact must consist of an “invasion of a legally protected interest which is (a) concrete and particularized, and (b) actual or imminent, not ‘conjectural’ or ‘hypothetical.’”<sup>177</sup>

Invasion of a legally protected interest:

Plaintiff files this action against the United States and Secretary of the Interior, seeking a declaratory judgment that the approved dam project will eliminate federally threatened bog turtles directly and by destruction of their habitat, in violation of the Endangered Species Act. The ESA seeks to protect species of animals against threats to their continuing existence caused by humans.<sup>178</sup> The ESA instructs the Secretary of the Interior to promulgate by regulation a list of those species that are either endangered or threatened under enumerated criteria, and to define the critical habitat of these species.<sup>179</sup> Section 7(a)(2) of the ESA then provides, in pertinent part:

Each Federal agency shall, in consultation with and with the assistance of the Secretary [of the Interior], 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 of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical.<sup>180</sup>

The bog turtle was listed as federally threatened in 1997.<sup>181</sup> Plaintiff—through its attorneys and as a “juristic person”—relies on the citizen suit provision of the ESA, which provides:

[A]ny person may commence a civil suit on his own behalf to enjoin any person, including the United States and any other governmental instrumentality or agency, . . . who is alleged to be in violation of any provision of this chapter or regulation issued under the authority thereof; to compel the Secretary to apply, . . . the prohibitions set forth in or authorized pursuant to . . . of this title with respect to the taking of any resident endangered species or threatened species; against the Secretary where there is alleged a failure of the Secretary to perform any act or duty . . . under this title which is not discretionary with the Secretary. The district courts shall have jurisdiction, without regard to the amount in controversy or the citizenship of the parties, to enforce any such provision or regulation, or to order the Secretary to perform such act or duty, as the case may be.<sup>182</sup>

(a) The Injury in Fact Is Concrete and Particularized

As noted above, Plaintiff is characteristic bog turtle habitat and is a mapped Element Occurrence for a viable bog turtle colony. Plaintiff’s fundamental elements include ideal habitat for the bog turtles: (1) appropriate hydrology, with saturated soils containing dry and wet patches; (2) appropriate soils, with saturated marl substrate; and (3) characteristic dominant vegetation of graminoid species.

The dam Plaintiff seeks to enjoin will change each and everyone one of Plaintiff’s fundamental elements. The Plaintiff will completely dry out if the dam is built. Plaintiff will disappear and the bog turtle colony, which relies on the naturally functioning Plaintiff, will not survive.<sup>183</sup>

(b) The Injury in Fact Is Imminent

The Defendant United States has approved funding for the dam and the Secretary of the Interior has issued the necessary permits to allow the Army Corp of Engineers to begin construction.

**“Second, there must be a causal connection between the injury and the conduct complained of—the injury has to be fairly . . . traceable to the challenged action of the defendant, and not . . . the result of the independent action of some third party not before the court.”<sup>184</sup>**

The Defendant United States has approved funding for the dam and the Secretary of the Interior has issued the necessary permits to allow the Army Corp of Engineers to begin construction. The dam will alter the natural water flow regime. In doing so, the natural hydrology and the saturated

175. *Bog Turtle*, N.Y. NAT. HERITAGE PROGRAM (July 17, 2008), <https://www.nrc.gov/docs/ML0833/ML083390017.pdf>.

176. EDINGER ET AL., *supra* note 174, at 56.

177. *Id.* at 560-61.

178. See Endangered Species Act, 16 U.S.C. § 1531 (2012); see generally *Tenn. Valley Auth. v. Hill*, 437 U.S. 153 (1978).

179. See Endangered Species Act, 16 U.S.C. § 1531 (2012).

180. See 16 U.S.C. § 1536(a)(2) (2012).

181. See *supra* note 174.

182. See 16 U.S.C. § 1540(g) (2012) (emphasis supplied).

183. For a more comprehensive discussion of the ecological effects of dams (beyond its impacts to the particular bog turtle habitat DNE here), see <https://www.internationalrivers.org/resources/beyond-dams-options-alternatives-3966>.

184. *Lujan II*, 504 U.S. at 560-61.

soils of the Plaintiff will cease to exist. The dam will eliminate the Plaintiff's four fundamental aspects—its abiotic features (soils, hydrology), its native biota (including the federally threatened bog turtles), its characteristic processes, and the spatial boundaries in which these operate. The wetland will dry out and cease to exist, along with all the organisms that depend on it.

“Third, it must be ‘likely,’ as opposed to merely ‘speculative,’ that the injury will be ‘redressed by a favorable decision.’”<sup>185</sup>

If the court were to permanently enjoin construction of the dam, the Plaintiff and its resident bog turtle colony would not be destroyed by the dam. The natural ecosystem would be permitted to exist, persist, and maintain its natural processes.

Would this mean that the water storage, flood protection and/or energy generation that the dam was planned to provide is now impossible? No. Modern alternatives to the costly dam construction and upkeep exist. For instance, water conservation practices, desalination plants and infiltration gallery technology may provide sustainable options for water storage. Sustainable alternatives for flood management include practices that reduce surface runoff and riparian and in-river technology, along with the common sense approach of separating human communities from areas that naturally flood. Finally, there are superior alternatives to hydropower that include energy conservation and efficiency measures as well as solar and wind power generation.<sup>186</sup> Given humans' dependence on natural wetland ecosystems,<sup>187</sup> along with the morality of choosing not to extinguish another species, this is a victory for both nature and humans.

---

185. *Id.* at 561.

---

186. *See generally* Beyond Dams: Options & Alternatives. A Report by American Rivers and International Rivers Network, Written by Elizabeth Brink of International Rivers Network and Serena McClain and Steve Rothert of American Rivers (May 2004), at <https://www.internationalrivers.org/sites/default/files/attached-files/beyonddams.pdf>.

187. Wetlands maintain and improve water quality, water supply, flood protection, erosion control, and storm surge protection. Wetlands also provide important wildlife habitat and sequester carbon. *See generally* *Why Are Wetlands Important?*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/wetlands/why-are-wetlands-important> (last visited June 21, 2017).