

6-2008

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Recommended Citation

Alyson C. Flournoy, Heather Halter & Christina Storz, *Harnessing the Power of Information to Protect Our Public Natural Resource Legacy*, 86 Tex. L. Rev. 1575 (2008), available at <http://scholarship.law.ufl.edu/facultypub/56>

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Harnessing the Power of Information to Protect Our Public Natural Resource Legacy

Alyson C. Flournoy,^{*} Heather Halter^{**} & Christina Storz^{***}

I. Introduction

Over the past century, Congress has enacted numerous laws that recognize the value of the vast store of natural resources under federal control.¹ These laws govern the management and use of water and lands, as well as the ecosystems, biodiversity, and minerals found in and on these waters and lands. A remarkable number of these statutes explicitly embrace the goal of preserving public natural resources and the services and values they provide for future generations.² Some also articulate a goal or mandate

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1. *See, e.g.*, Estuary Protection Act § 1, 16 U.S.C. § 1221 (2000) (“Congress finds and declares that many estuaries in the United States are rich in a variety of natural, commercial, and other resources, including environmental natural beauty, and are of immediate and potential value”); Coastal Zone Management Act of 1972 § 302, 16 U.S.C. § 1451(a) (2000) (“[T]here is a national interest in the effective management, beneficial use, protection, and development of the coastal zone.”); National Forests Management Act of 1976 § 11, 16 U.S.C. § 1609(a) (2000) (“Congress declares that the National Forest System consists of units of federally owned forest, range, and related lands throughout the United States and its territories, united into a nationally significant system”); Federal Land Policy and Management Act of 1976 § 102, 43 U.S.C. § 1701(a)(2) (2000) (“[T]he national interest will be best realized if the public lands and their resources are periodically and systematically inventoried and their present and future use is projected through a land use planning process”).

2. *See, e.g.*, National Park Service Organic Act § 1, 16 U.S.C. § 1 (2000) (“The service shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations . . . to conserve the scenery and the natural and historic objects and the wildlife therein . . . by such means as will leave them unimpaired for the enjoyment of future generations.”); Land and Water Conservation Fund Act of 1965 § 1, 16 U.S.C. § 460 (2000) (“The Congress finds and declares it to be desirable that all American People of present and future generations be assured adequate outdoor recreation resources”); National Historic Preservation Act Amendments of 1980 § 101(a), 16 U.S.C. § 470(b)(4) (2000) (“[T]he preservation of this irreplaceable heritage is in the public interest so that its vital legacy of cultural, educational, aesthetic, inspirational, economic, and energy benefits will be maintained and enriched for future generations of Americans”); Archaeological Resources Protection Act of 1979 § 2(b), 16 U.S.C. § 470aa(b) (2000) (“The purpose of this chapter is to secure, for the present and future benefit of the American people, the protection of archaeological resources and sites which are on public lands and Indian lands”); National Wildlife Refuge System Improvements Act of 1997 § 4, 16 U.S.C. § 668dd(a)(2) (2000) (“The mission of the [Wildlife Refuge] System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources . . . for the benefit of present and future generations of Americans.”); Wilderness Act § 2, 16 U.S.C. § 1131(a) (2000) (“[I]t is hereby declared to be the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness.”); 16 U.S.C. § 1221 (2000) (“Congress finds and declares that many estuaries in the United States are rich in a variety of natural, commercial, and other resources,

of sustainable use of public natural resources.³ All of these statutes reflect an awareness that those of us alive today will leave a legacy of public natural resources to the succeeding generation.⁴ They also implicitly embrace the idea that we should pay attention to what that legacy will look like—the quantity and quality of the public natural resources we leave the next generation.⁵

including environmental natural beauty, and are of immediate and potential value”), Wild and Scenic Rivers Act § 1, 16 U.S.C. § 1271 (2000) (“It is hereby declared to be the policy of the United States that certain selected rivers . . . possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values . . . and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations.”); 16 U.S.C. § 1451(a) (“[T]he coastal zone is rich in a variety of natural, commercial, recreational, ecological, industrial, and esthetic resources of immediate and potential value to the present and future well-being of the Nation.”); 16 U.S.C. § 1609(a) (“Congress declares that the National Forest System consists of units of federally owned forest, range, and related lands throughout the United States and its territories, united into a nationally significant system”); Alaska National Interests Lands Conservation Act § 101, 16 U.S.C. § 3101(a) (2000) (“In order to preserve for the benefit, use, education, and inspiration of present and future generations certain lands and waters”); Emergency Wetlands Resources Act of 1986 § 2, 16 U.S.C. § 3901(a)(9) (2000) (“[T]he existing Federal, State, and private cooperation in wetlands conservation should be strengthened in order to minimize further losses of these valuable areas and to assure their management in the public interest for this and future generations.”); National Maritime Heritage Act of 1994 § 2, 16 U.S.C. § 5401(5) (2000) (“The preservation of this irreplaceable maritime heritage is in the public interest so that its vital legacy of cultural, educational, aesthetic, inspirational, and economic benefits will be maintained and enriched for future generations of Americans.”); National Environmental Policy Act of 1969 (NEPA) § 101, 42 U.S.C. § 4331(a) (2000) (“The Congress . . . declares that it is the continuing policy of the Federal government . . . to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.”); Energy Reorganization Act of 1974 § 2, 42 U.S.C. § 5801(a) (2000) (“The Congress hereby declares that the general welfare and the common defense and security require effective action to develop, and increase the efficiency and reliability of use of, all energy sources to meet the needs of present and future generations”).

3. *See, e.g.*, Multiple-Use Sustained-Yield Act of 1960 § 2, 16 U.S.C. § 529 (2000) (“The Secretary of Agriculture is authorized and directed to develop and administer the renewable surface resources of the national forests for multiple use and sustained yield of the several products and services obtained therefrom.”); 16 U.S.C. § 1604(e) (requiring that forest-management plans provide for multiple use and sustained yield); Magnuson–Stevens Fishery Conservation and Management (Magnuson) Act § 301, 16 U.S.C. § 1851(a)(1) (2000) (setting a national standard under which “[c]onservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry”); 43 U.S.C. § 1701(a)(7) (mandating that federal land be managed on the bases of multiple use and sustained yield).

4. The concept of a generation is somewhat imprecise; it is a construct, not a physical reality. The word is used here and elsewhere to refer both to a group of individuals of roughly the same age and to the period of time between the birth of succeeding generations. *See, e.g.*, MERRIAM-WEBSTER’S COLLEGIATE DICTIONARY 521 (11th ed. 2006) (defining *generation* as both “a body of living beings constituting a single step in the line of descent from an ancestor” and “the average span of time between the birth of parents and of their offspring”).

5. In addition to these federal laws, at least thirty-two states include references to the interests of future generations—or references to sustainability or sustainable development—in statutes related to the use of natural resources. A complete list of these states and state statutes is on file with the author. Some are more protective of the resource legacy—making it an explicit priority among competing demands—and others merely invoke it in a list of competing priorities to be

However, in practice, our laws have proven unequal to the lofty objectives of preserving a legacy of public natural resources for our children or achieving sustainable use of these resources. There are many factors that contribute to this shortfall, but inherent inadequacies in the design of these statutes cannot be overlooked as an important determinant. Despite the statutes' broadly stated aspirations toward sustainability and protection of the interests of future generations, only a handful of these statutes include strong and enforceable mandates for sustainable resource use.⁶ Many of these statutes accord natural resource-management agencies broad discretion to balance and permit a long list of competing uses of a given resource, including degrading and depleting uses.⁷ They lack any clear mandate that the agency protect any particular quantity or quality of a given resource for today, much less for future generations.

Thus our laws often promise far more than they can deliver. It should therefore come as no surprise that in practice, many of our public natural resources are declining in quantity and quality.⁸ Without an effective legal

reconciled, with little direction to prioritize resource interests of future generations. *Compare, e.g.,* MINN. STAT. ANN. § 116P.01 (West 2005) (“[T]o ensure wise stewardship of the state’s environment and natural resources for the benefit of current citizens and future generations . . . requires foresight, planning, and long-term activities . . . [To] undertake such activities properly, a long-term, consistent, and stable source of funding must be provided.”), *with* TEX. AGRIC. CODE ANN. § 2.004 (Vernon 2004) (providing that the Agriculture Policy Board shall “advocate and recommend strategies for agriculture that enhance agriculture production, income, and employment, that benefit consumers, and that promote efficient and sustainable use of natural resources”).

6. For example, the “take” prohibition in the Endangered Species Act, while not absolute, is frequently cited as a rare example of a relatively strong mandate that makes clear how to resolve a conflict among competing values. *See, e.g.,* Federico Cheever & Michael Balster, *The Take Prohibition in Section 9 of the Endangered Species Act: Contradictions, Ugly Ducklings, and Conservation of Species*, 34 ENVTL. L. 363, 365 (2004) (describing the prohibition as “simple, unambiguous, and breathtaking in its reach and power”). *Compare, e.g.,* Endangered Species Act of 1973 § 9(a)(1)(B), 16 U.S.C. § 1538(a)(1)(B) (2000) (making it unlawful “to take any [endangered] species within the United States”), *with* Wilderness Act of 1964, 16 U.S.C. §§ 1131–1136 (providing generally for the establishment and preservation of federal wilderness areas), *and* National Forest Management Act § 6(g)(3)(B), 16 U.S.C. § 1604(g)(3)(B) (requiring land-management regulations to “provide, where appropriate, to the degree practicable, for steps to be taken to preserve the diversity of tree species”), *and* 16 U.S.C. § 1851(a)(1) (requiring fishery regulations to “prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery”).

7. *See, e.g.,* 16 U.S.C. § 529 (“In the administration of the national forests due consideration shall be given to the relative values of the various resources in particular areas.”); Clean Water Act § 404, 33 U.S.C. § 1344 (2000) (providing for the issuance of permits for “the discharge of dredged or fill material into the navigable waters”); *see also* Norton v. S. Utah Wilderness Alliance, 542 U.S. 55, 58 (2004) (discussing “multiple use management” as “a deceptively simple term that describes the enormously complicated task of striking a balance among the many competing uses to which land can be put”).

8. *See, e.g.,* MILLENNIUM ECOSYSTEM ASSESSMENT, ECOSYSTEMS AND HUMAN WELL-BEING: BIODIVERSITY SYNTHESIS 2–5 (2005), *available at* <http://www.millenniumassessment.org/documents/document.354.aspx.pdf> (describing the rapid conversion of ecosystems—including increasing rates of extinction, declining genetic diversity, and more homogeneous distribution of species—and predicting similar changes in the future); MILLENNIUM ECOSYSTEM ASSESSMENT,

mechanism to check the decline, this pattern of incremental resource depletion and degradation will likely continue. This Article therefore considers the possibility that we need, and should consider enacting, a law that provides an effective check on the degradation and depletion of public natural resources across the board.⁹ Effective preservation of a public natural resource legacy requires a statute that can achieve two core objectives: to define the public natural resource legacy we wish to leave to our children and grandchildren, and to prohibit actions that impair that legacy.

Many commentators have suggested that the National Environmental Policy Act¹⁰ (NEPA) was enacted to accomplish these objectives.¹¹ Thus,

ECOSYSTEMS AND HUMAN WELL-BEING: WETLANDS AND WATER SYNTHESIS 2–10 (2005), available at <http://www.millenniumassessment.org/documents/document.358.aspx.pdf> (describing the causes of wetland loss and degradation and its effect on population growth, economics, and consumption patterns); NAT'L OCEANIC & ATMOSPHERIC ADMIN., NOAA'S NATIONAL MARINE FISHERIES SERVICE REPORT ON THE STATUS OF THE U.S. FISHERIES FOR 2006, at 5 (2006), available at http://www.nmfs.noaa.gov/sfa/domes_fish/StatusofFisheries/2006/2006RTCFinal_Report.pdf (reporting on the increasing number of overfished stocks); WELFARE RANCHING: THE SUBSIDIZED DESTRUCTION OF THE AMERICAN WEST 162–257 (George Wuerthner & Mollie Matteson eds., 2002) (detailing the degradation of various natural resources and life forms); Energy Info. Admin., U.S. Dep't of Energy, Energy in the United States: 1635–2000 (2007), <http://www.eia.doe.gov/emeu/aer/eh/frame.html> (describing the historical use and environmental impact of natural resources such as coal and petroleum). See generally ALYSON C. FLOURNOY ET AL., SQUANDERING PUBLIC RESOURCES (2007) (examining government policies that result in the degradation of natural resources).

9. It can be argued that the failure to achieve sustainable use is not a shortcoming, but the intended and desired outcome achieved by laws that incorporate a combination of weak mandates and unattainable ones. See John P. Dwyer, *The Pathology of Symbolic Legislation*, 17 *ÉCOLOGIE L.Q.* 233, 233–35 (1990) (arguing that legislators reap the “benefits of ‘voting for health and the environment’” by passing environmental statutes that ignore obstacles to implementation and set unattainable standards). However, given the complexity of the stated goals, the opaque decision-making processes, and the limited information on resource use and the impacts of individual decisions, it seems at least possible that neither lawmakers nor the public are fully aware of the effects of the design of current law. Thus, it may be fairer to attribute the incoherence in our statutes to a failure to seriously engage the question of what legacy we wish to leave, how to preserve this legacy, the costs involved, and the importance of doing so. Until we seriously debate the question of the resource legacy we wish to leave to future generations and how to balance the needs of the present and future generations, we are unlikely to leave any consciously chosen legacy.

10. 42 U.S.C. §§ 4321–4347 (2000). NEPA requires federal agencies to collect and evaluate information on environmental impacts and alternative actions before they undertake, fund, or permit any major action that would significantly affect the environment. *Id.* § 4332.

11. See, e.g., LYNTON KEITH CALDWELL, *THE NATIONAL ENVIRONMENTAL POLICY ACT: AN AGENDA FOR THE FUTURE*, at xvi–xvii, 2–9, 33–38 (1998) (noting that one of NEPA's goals was to set a national environmental policy that would both (1) instruct agencies how to balance competing interests and (2) encourage agencies to articulate values without legislating them); Matthew J. Lindstrom, *Procedures Without Purpose: The Withering Away of the National Environmental Policy Act's Substantive Law*, 20 *J. LAND RESOURCES & ENVTL. L.* 245, 245–46 (2000) (“[NEPA] provides a substantive environmental policy vision and institutional infrastructure in addition to procedural mechanisms designed to enhance the salience of environmental values in federal agency decision-making.”); Paul S. Weiland, *Amending the National Environmental Policy Act: Federal Environmental Protection in the Twenty-First Century*, 12 *J. LAND USE & ENVTL. L.* 275, 281–82 (1997) (stating that NEPA was designed to establish the nation's priorities in environmental policy and to ensure those policies and goals are carried out by the federal government); Nicholas Yost, *NEPA's Promise—Partially Fulfilled*, 20 *ENVTL. L.* 533, 533–34 (1990) (quoting one NEPA author

one avenue to explore for protecting our public natural resource legacy is NEPA's untapped potential. It is clear that NEPA currently lacks an adequate substantive standard to ensure protection of a natural resource legacy.¹² Many commentators have lamented NEPA's lack of a substantive standard over the years, and some have called for amending NEPA to include a substantive standard of environmental protection.¹³ This Article considers whether NEPA, reinforced with a substantive standard of protection, would be the best tool for defining and protecting a public natural resource legacy.

A review of the critiques of NEPA, and specifically those focused on how NEPA employs information, suggests that even with a substantive standard, NEPA would not necessarily provide the best vehicle for defining and protecting our resource legacy. After considering NEPA's merit and potential as a tool for preserving our natural resource legacy, Part II of this Article surveys the principal critiques of NEPA's approach to information collection, analysis, and dissemination. Many of the shortcomings identified in this survey would also impair an amended NEPA's power to define and preserve our resource legacy.

In light of these critiques, in Part III, we propose an alternative model for a statute better tailored to defining and protecting our public natural resource legacy. Subpart III(A) briefly describes the contours of a statute that could be called a National Environmental Legacy Act (NELA, or Legacy Act). Subpart III(B) elaborates on how such a statute could harness the power of information effectively to define and protect our public natural resource legacy.

II. The National Environmental Policy Act: Information and the Protection of Our Resource Legacy

If our goal is to define and protect a legacy of public natural resources for the next generation, NEPA warrants serious consideration as the appropriate vehicle for achieving that goal because of its broad scope and explicit ambitions to preserve natural resources and environmental quality for future generations. NEPA is premised on the recognition of "the profound impact of man's activity on the interrelations of all components of the natural

as saying that NEPA "gives expression to our national goals and aspirations" and "provides a statutory foundation to which administrators may refer").

12. Early in the implementation of NEPA, the Supreme Court ruled that NEPA lacks a substantive standard of environmental protection. That is, it requires agencies to collect and consider information, but it does not require that they choose an environmentally preferable action or achieve any defined level of resource protection. See *infra* notes 19–21 and accompanying text.

13. See Lindstrom, *supra* note 11, at 264–66 (discussing proposed reforms to fix NEPA's inadequate substantive standard, including "amending NEPA to create a more explicit link between its substantive policies and procedural mechanism"); Weiland, *supra* note 11, at 290–93 (advocating an amendment to NEPA that clarifies environmental protection as a substantive goal in federal decision making). But see Lynton K. Caldwell, *NEPA Revisited. A Call for a Constitutional Amendment*, ENVTL. F., Nov.–Dec. 1989, at 18, 22 (calling for a constitutional amendment rather than legislative reform of NEPA).

environment, particularly the profound influences of population growth, high-density urbanization, industrial expansion, resource exploitation, and new and expanding technological advances.”¹⁴ In its statement of policy, NEPA recognizes “the critical importance of restoring and maintaining environmental quality to the overall welfare and development of man.”¹⁵ It aspires to create and maintain conditions under which “man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.”¹⁶ In seeking to carry out this ambition, NEPA adds to the federal government’s obligations a duty to use its resources “to the end that the Nation may . . . fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.”¹⁷ While NEPA also imposes the duty that agencies seek to “attain the widest range of beneficial uses of the environment,” this is to be “without degradation, risk to health or safety, or other undesirable and unintended consequences.”¹⁸

Thus, NEPA can be fairly said to have at its core a legacy ambition—a conscious recognition of a duty we owe as a nation to future generations. It sets forth a policy that all federal agencies take steps to fulfill the role of steward of our natural resources. Because of this congruence of NEPA’s stated goals and the goal of preserving a public natural resource legacy, it makes sense to explore whether NEPA would be the most effective vehicle for defining and protecting a natural resource legacy.

Any discussion of NEPA’s potential must begin with the statute’s most frequently identified shortcoming: its lack of substantive force. The Supreme Court’s ruling in the *Strycker’s Bay*¹⁹ case that NEPA imposes no substantive environmental duties on agencies crystallized NEPA’s status as a purely procedural statute.²⁰ Critics have repeatedly pointed to this interpretation as a primary impediment to achieving many of the broad policies and duties articulated in § 101 of the Act.²¹ Further, commentators disagree on whether

14. 42 U.S.C. § 4331(a).

15. *Id.*

16. *Id.*

17. *Id.* § 4331(b).

18. *Id.* § 4331(b)(3).

19. *Strycker’s Bay Neighborhood Council, Inc. v. Karlen*, 444 U.S. 223 (1980).

20. *See id.* at 227–28 (holding that NEPA does not require agencies to select environmentally preferable outcomes; it requires only that they comply with the statute’s procedural requirements).

21. *See, e.g.,* Michael C. Blumm, *The National Environmental Policy Act at Twenty: A Preface*, 20 ENVTL. L. 447, 450 (1990) (“The *coup de grace* came when the Supreme Court held NEPA to be essentially procedural, ignoring the high-minded aspirations contained in section 101 and apparently considering NEPA to require just the paperwork and public disclosure specified in section 102.”); Lindstrom, *supra* note 11, at 258–62 (“[I]n *Strycker’s Bay Neighborhood Council, Inc. v. Karlen*, the Supreme Court effectively squashed any possibility of judicial enforcement of NEPA’s substantial goals.”). Oliver Houck has described the shortcoming as the lack of precision in articulating the policy. Oliver A. Houck, *Is that All? A Review of The National Environmental Policy Act, An Agenda for the Future*, by Lynton Keith Caldwell, 11 DUKE ENVTL. L. & POL’Y F. 173, 178–80 (2000).

the *Strycker's Bay* decision is even a proper interpretation of NEPA.²² Regardless, under the Supreme Court's interpretation, § 102 of NEPA primarily requires federal agencies to: (1) consider environmental impacts of and alternatives to major proposed actions using a systematic, interdisciplinary approach,²³ and (2) prepare detailed statements on these impacts.²⁴ Even so interpreted, most agree that NEPA has had substantial beneficial effects.²⁵ Thus, some might argue that the preferred route to protecting a natural resource legacy would be to amend NEPA to incorporate a long-needed substantive standard.

The lack of a substantive standard has also given rise to the critique that NEPA is flawed because of the inherent tension between the rationalist comprehensive model of decision making on which environmental-impact-assessment practice is premised and the lack of clear goals and priorities in the NEPA process.²⁶ Requiring agencies to compile all the information

22. See Lynton K. Caldwell, *Beyond NEPA: Future Significance of the National Environmental Policy Act*, 22 HARV. ENVTL. L. REV. 203, 206, 221–22 (1998) (detailing at least four explanations of NEPA's inadequacy in practice); Yost, *supra* note 11, at 539–41 (placing blame on the Supreme Court's "consistently crabbed interpretations" of NEPA).

23. 42 U.S.C. § 4332(2)(A), (B), (E).

24. *Id.* § 4332(2)(C). These duties are further elaborated in the Council on Environmental Quality (CEQ) regulations. 40 C.F.R. §§ 1500–1508.28 (2008).

25. COUNCIL ON ENVTL. QUALITY, THE NATIONAL ENVIRONMENTAL POLICY ACT: A STUDY OF ITS EFFECTIVENESS AFTER TWENTY-FIVE YEARS, at iii (1997) [hereinafter NEPA AT TWENTY-FIVE], available at <http://ceq.eh.doe.gov/nepa/nepa25fn.pdf> (suggesting that NEPA has been a success because it forces agencies to consider environmental consequences of their actions and involves the public in the agency decision-making process); Stark Ackerman, *Observations on the Transformation of the Forest Service: The Effects of the National Environmental Policy Act on U.S. Forest Service Decision Making*, 20 ENVTL. L. 703, 703 (1990) (stating that NEPA "accelerated and stimulated" positive changes in the Forest Service); Dinah Bear, *Some Modest Suggestions for Improving Implementation of the National Environmental Policy Act*, 43 NAT. RESOURCES J. 931, 931 (2003); Caldwell, *supra* note 22, at 205, 207 (acknowledging that NEPA's procedural reform has "improved the quality of public planning and decisionmaking"); James L. Connaughton, Chairman, President's Council on Env'tl. Quality, *Modernizing the National Environmental Policy Act: Back to the Future* (Apr. 10, 2003), in 12 N.Y.U. ENVTL. L.J. 1, 5 (2003) (asserting that while a small aspect of NEPA has "drawn heat," NEPA has worked well); Paul J. Culhane, *NEPA's Effect on Agency Decision Making: NEPA's Impacts on Federal Agencies, Anticipated and Unanticipated*, 20 ENVTL. L. 681, 681–93 (1990) (stating that NEPA resulted in the consideration of environmental impacts in administrative decisions, the diversification of agency staffs, and public participation); Houck, *supra* note 21, at 188–91 (remarking that despite its problems, NEPA has still pressured federal decision making, provided more environmental alternatives, and brought the public into the process); Bradley C. Karkkainen, *Toward a Smarter NEPA: Monitoring and Managing Government's Environmental Performance*, 102 COLUM. L. REV. 903, 906 (2002) ("NEPA transformed the institutional landscape in its revolutionary youth, bringing important and lasting changes to the way government does business."); Mary H. O'Brien, *NEPA as It Was Meant to Be: NCAP v. Block, Herbicides, and Region 6 Forest Service*, 20 ENVTL. L. 735, 736 (1990) (contending that NEPA spurred positive changes for the Forest Service's vegetation management).

26. Culhane, *supra* note 25, at 695–96, 702. Culhane notes, "NEPA does not explicitly provide EIS writers with standards for weighing environmental costs against asserted project benefits, much less with a technical preference function." *Id.* at 695. Thus, agencies seek to compile information appropriate to a rationalist decision, but the information is used for a different and less decisive purpose. See *id.* at 693–95 ("The NEPA process has adopted the form, not the substance, of the rational-comprehensive-optimizing model of decision making."). Culhane applies garbage-can

needed to support a rationalist decision is overkill if agencies need only compile and “consider” this information as they exercise their discretion on which values to prioritize and which to sacrifice. A substantive environmental standard could address this critique by focusing NEPA’s open-ended information demands.

However, the absence of a substantive standard for environmental protection is not the only criticism of NEPA’s design. There are a number of other significant critiques of NEPA that should be considered in assessing its capacity to define and protect a public natural resource legacy. In particular, commentators have focused attention on various shortcomings in how information is deployed under NEPA. A frequent criticism centers on NEPA’s central focus on the preparation of a document—an environmental impact statement (EIS) or an environmental assessment (EA)—and the resulting emphasis on the quantity of information collected.²⁷ Many critics concur that “[t]he means have become ends in themselves.”²⁸ The statute enshrines adequate documentation as the primary enforceable obligation of the agency and therefore, the agency focuses primarily on assembling enough documentation. Challenges to agency compliance with NEPA also typically focus on adequacy of the relevant documents, and judicial decisions in successful challenges to agency NEPA compliance frequently turn on gaps in these documents—information not included, analysis not provided, alternatives not developed.²⁹ As several commentators have observed, the

decision theory to describe the highly politicized decision-making context in which NEPA compliance occurs. *Id.* at 682–89, 695–96. This may explain why the CEQ observed in its report NEPA AT TWENTY-FIVE, *supra* note 25, at 28, that environmental impact statements (EISs) often have more data than needed, but not enough analysis of the data focused on “the decision” and expressed in clear, concise language. The CEQ then states that “NEPA is about making choices not endlessly collecting raw data.” *Id.* One might say that Culhane’s point is that because NEPA lacks any substantive focus or goal for the agency, NEPA is about endlessly collecting raw data—it does not provide any guidance on how to make decisions.

27. The foundation of the EIS requirement is the statute’s mandate that agencies prepare a detailed statement. *See* 42 U.S.C. § 4332(2)(C) (detailing the required information to be included in a report or recommendation). CEQ regulations have elaborated to mandate preparation of various documents depending on the nature of the impacts of the proposed action or the phase of the agency’s decision-making process. These include EAs, findings of no significant impact (FONSI)s, supplemental EISs, programmatic EISs, and records of decision. *See* 40 C.F.R. §§ 1501.4, 1502.2, 1502.20, 1508.28 (providing instructions for the preparation of EAs, FONSI)s, and EISs).

28. Culhane, *supra* note 25, at 700; *see also* NEPA AT TWENTY-FIVE, *supra* note 25, at iii (remarking that some agencies may “act as if the detailed statement called for in the statute is an end in itself, rather than a tool to enhance and improve decision-making”).

29. *See, e.g.*, Ecology Ctr., Inc. v. Austin, 430 F.3d 1057, 1065–68 (9th Cir. 2005) (holding that a U.S. Forest Service EIS for salvage harvesting of old-growth forest habitat violated NEPA because it failed to adequately explain the basis for the Service’s conclusion that eliminating a portion of habitat would not adversely affect the viability of Black-backed Woodpeckers in the area); Washington County, N.C. v. U.S. Dep’t of Navy, 357 F. Supp. 2d 861, 861 (E.D. N.C. 2005) (finding that a final environmental impact statement (FEIS) prepared by the Department of Navy failed to adequately consider scientific literature in analyzing the impacts on lakes and waterfowl, as required under NEPA); Sierra Club v. Bosworth, 199 F. Supp. 2d 971, 971 (N.D. Cal. 2002)

result is to encourage agencies to gold-plate their EISs by including every conceivably relevant piece of information to avoid reversal.³⁰ The result is overly lengthy documents that are less valuable than more concise, focused documents would be.

Another consequence of the emphasis on comprehensiveness is that it delays completion of EISs, therefore delaying the agency's consideration of the information in the document as part of its underlying decision-making process. It is widely agreed that consideration of impacts and alternatives must occur early in the decision-making process to be effective.³¹ Delays increase the risk that a particular project alternative and design may become entrenched in decision makers' and proponents' minds before the EIS or EA is complete, and thus before the complete range of alternatives and impacts are fully developed. This undermines a central goal of NEPA compliance—to inform agency decision making.

Overly lengthy documents also create barriers to public participation for those who seek to review an EIS and participate in the comment process. Wading through unnecessarily lengthy documents demands additional time by the interested public and may increase the cost of obtaining needed technical expertise. Excessive length can also work against transparency. Key information is harder to find when it is buried within five volumes, each several hundred pages in length.

A second frequently voiced criticism of NEPA's use of information is the uneven *quality* of the information contained in NEPA documents.³² In some measure, this relates to the information-quantity problem discussed above. In their efforts to create EISs and EAs that are unassailable, agencies may include marginally relevant or poor quality information. Not only does this produce the problems described above, the inclusion of poor quality information can also lead to worse decisions.

(granting summary judgment where an EIS prepared by the U.S. Forest Service did not adequately disclose and analyze the environmental impacts of post-fire logging and fuel-break maintenance).

30. See NEPA AT TWENTY-FIVE, *supra* note 25, at iii (observing that a result of NEPA is "endless documentation"); Culhane, *supra* note 25, at 693–94 (giving an example of the massive documentation produced due to the requirements, yet reporting that the quality of these documents is deficient); Karkkainen, *supra* note 25, at 917–19 (stressing that agencies produce overly detailed records to "bullet-proof" their decisions even though the NEPA requirements do not necessarily result in improving the quality of these records).

31. See 40 C.F.R. § 1501.2 (2000) ("Agencies shall integrate the NEPA process with other planning at the earliest possible time to insure [sic] that planning and decisions reflect environmental values, to avoid delays later in the process, and to head off potential conflicts."); NEPA AT TWENTY-FIVE, *supra* note 25, at II (positing that the earlier agencies incorporate NEPA's framework into their planning process, the more successful the outcome of the agencies' proposals); Bear, *supra* note 25, at 941 (suggesting that "much of the time, information matters a lot" in the decision-making process); Karkkainen, *supra* note 25, at 924–25 (proposing that starting the NEPA analyses earlier is more beneficial to the decision-making process).

32. See Culhane, *supra* note 25, at 694 (discussing multiple studies that show widespread inaccuracies in EISs); Karkkainen, *supra* note 25, at 921–23 (suggesting that the quantity of information contained in NEPA documents dilutes its quality).

A third major criticism of NEPA's use of information is the unnecessarily narrow focus of the information collected and the limited use to which the information is put. NEPA documents are prepared for the decision on whether to permit, fund, or undertake a single proposed action; they are rarely considered thereafter, except in litigation regarding NEPA compliance. Commentators have noted many shortcomings that attend this one-shot use of EISs.³³ First, there is a huge investment of resources to collect and analyze information in the course of preparing an EIS, yet the statute creates no incentive to tailor the information collection or presentation so that it may have use in other contexts.³⁴ The obsessive focus on the EIS precludes realizing the full value of the information by putting it into a more widely usable format.

Another undesirable consequence of the narrow focus on the decision point is the lack of any incentive or framework for postdecision monitoring of environmental conditions. Such monitoring would serve a number of beneficial purposes. First, agencies could learn from this check on the accuracy of their *ex ante* predictions about environmental impacts.³⁵ Collecting this information would enhance the database available to the agencies making future decisions, and enable agencies to engage in continuous learning to improve their assessment and decision-making capacity. In contrast, the general wisdom is that information and data gathered in EISs collect dust on shelves.³⁶ Beyond the opportunity for learning, postdecision monitoring also would open the door to permit adaptive management in implementing the relevant decision.³⁷ If monitoring revealed unanticipated environmental impacts, the agency might choose to undertake additional mitigation measures or alter its course of action.

A related criticism of the lack of postdecision monitoring arises from agencies' frequent reliance on mitigation as an essential aspect of NEPA compliance. Under CEQ regulations, agencies may avoid preparation of an EIS for a proposed major federal action that would significantly affect the human environment if, by virtue of mitigation measures, the impacts can be

33. *E.g.*, Bear, *supra* note 25, at 944–45 (listing the consequences of the one-time use of the EISs); Karkkainen, *supra* note 25, at 925–32 (explaining the problems associated with NEPA's one-time predictive approach); *see also* NEPA AT TWENTY-FIVE, *supra* note 25, at 31–34 (pointing out the benefits of continuous adaptive management based on initial NEPA reports); Connaughton, *supra* note 25, at 9–10 (proposing a requirement of adaptive management and continual monitoring).

34. *See* Karkkainen, *supra* note 25, at 923 (observing that the project-specific nature of NEPA reports prevents the use of these reports in other contexts).

35. *Id.* at 907–08.

36. *See id.* at 927 (stating that NEPA does not generally require any “post-project assessment”).

37. *Id.* at 907–08; NEPA AT TWENTY-FIVE, *supra* note 25, at 31–34; NEPA TASK FORCE, REPORT TO THE COUNCIL ON ENVIRONMENTAL QUALITY: MODERNIZING NEPA IMPLEMENTATION 45 (2003) [hereinafter NEPA TASK FORCE REPORT], available at <http://ceq.eh.doe.gov/nrf/report/finalreport.pdf>.

reduced below the level of “significance.”³⁸ This practice has generated considerable controversy,³⁹ largely because there is no mandatory monitoring or enforcement to determine if the promised mitigation measures are undertaken.⁴⁰ Postdecision monitoring is widely viewed as a critical missing component in NEPA practice.⁴¹

Finally, many critics have noted that despite a mandate to account for cumulative impacts,⁴² NEPA has not been very successful in generating information needed to permit the assessment of cumulative impacts.⁴³ Thus, while NEPA may improve agency decision making by permitting assessment of the incremental impacts of individual actions, it seems less well suited to assessing cumulative effect—a critical component of any effort to preserve a public natural resource legacy.

Calls for NEPA reform on the points described above have not gone unheeded over the past decade, and various initiatives have been launched by both supporters and critics of NEPA. Among efforts to assess NEPA’s effectiveness, identify problems, and propose solutions, the Clinton Administration undertook a review of NEPA on the twenty-fifth anniversary of its enactment, resulting in a 1997 report.⁴⁴ Under the George W. Bush Administration, the CEQ convened a NEPA Task Force that produced a 2003

38. See 40 C.F.R. § 1501.4(e) (2008) (allowing the agency to prepare a FONSI in lieu of an EIS).

39. See *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 340 (1989) (citing to an EIS’s assertion that numerous mitigation measures discussed in the study would greatly reduce the impacts of the proposed project); Blumm, *supra* note 21, at 476–77 (relating criticisms of using empty mitigation promises to avoid submitting an EIS, and offering critics’ suggestions on how to enforce these promises); Whitney Deacon, *The Bush Administration’s Attack on the Environment: Target: NEPA’s Environmental Impact Statement*, 10 MO. ENVTL. L. & POL’Y REV. 147, 151 (2003) (concluding that mitigation efforts can result in ineffective programs that are immune to any accountability). *But cf.* Karkkainen, *supra* note 25, at 908, 934–36 (advocating use of mitigated FONSIs with postdecision monitoring and enforcement of mitigation commitments).

40. See NEPA AT TWENTY-FIVE, *supra* note 25, at 31 (reporting that agencies usually do not gather data on their mitigation efforts); NEPA TASK FORCE REPORT, *supra* note 37, at 45 (finding that regulations do not require monitoring of the traditional “predict-mitigate-implement” model); Blumm, *supra* note 21, at 460 (presenting a critic’s proposal on enforcing mitigation measures by amending the regulations); Deacon, *supra* note 39, at 151 (“[B]ecause there is no post-project review of the accuracy of the predictions made in the EIS or the EA, there is no liability for the inaccuracy, which effectively means there is no accountability.”); Karkkainen, *supra* note 25, at 936 (acknowledging that NEPA does not require implementation of mitigation measures).

41. See Dinah Bear, *Some Modest Suggestions for Improving Implementation of the National Environmental Policy Act*, 43 NAT. RESOURCES J. 931, 941–48 (2003) (proposing implementation of postdecision monitoring).

42. The CEQ’s regulations call for the consideration of cumulative impacts of related actions in determining whether an action is significant and an EIS is required. 40 C.F.R. § 1508.27(b)(7).

43. See Terence L. Thatcher, *Understanding Interdependence in the Natural Environment: Some Thoughts on Cumulative Impact Assessment Under the National Environmental Policy Act*, 20 ENVTL. L. 611, 617–28 (1990) (surveying the confusing standards that courts have developed in trying to interpret the requirement).

44. NEPA AT TWENTY-FIVE, *supra* note 25.

report.⁴⁵ Following this report, the Task Force held regional hearings and produced several follow-up reports.⁴⁶ In 2005, led by Representative Richard Pombo, the U.S. House of Representatives Committee on Resources commissioned its own task force focused on reforming NEPA.⁴⁷ Yet the statute remains unchanged.

Of course, the limited success achieved by the frequent calls to reform NEPA to enhance its conservation potential can be ascribed in part to the lack of political will. And without the political will, no reform in any shape will occur. However, even assuming the political will to protect a legacy, efforts to amend a statute such as NEPA can easily be derailed by shifting focus to NEPA's shortcomings. For example, any proposal to strengthen NEPA is easily (if inaccurately) critiqued as destined to produce only more paperwork and delay. Moreover, any effort to reform existing environmental laws can generate as much opposition as enthusiasm—even from conservation groups—because they justifiably fear that opening the statutes to legislative reform will end up weakening them. Thus, timid, easily attacked reforms and tepid support make meaningful success in NEPA reform unlikely.

Taken together, all of NEPA's shortcomings and the stalemate in NEPA reform efforts indicate that an approach that complements NEPA, rather than seeking to amend it, may better achieve the goal of protecting a public natural resource legacy. Part III therefore elaborates a vision of a distinct Legacy Act that makes the definition and protection of a public natural resource legacy its central objective. It then explains how a Legacy Act could effectively harness the power of information and avoid the shortcomings of NEPA.

45. NEPA TASK FORCE REPORT, *supra* note 37.

46. COUNCIL ON ENVTL. QUALITY, A CITIZEN'S GUIDE TO THE NEPA: HAVING YOUR VOICE HEARD (2007), *available at* http://ceq.eh.doe.gov/nepa/Citizens_Guide_Dec07.pdf; COUNCIL ON ENVTL. QUALITY, ALIGNING NATIONAL ENVIRONMENTAL POLICY ACT PROCESSES WITH ENVIRONMENTAL MANAGEMENT SYSTEMS: A GUIDE FOR NEPA AND EMS PRACTITIONERS (2007), *available at* http://ceq.eh.doe.gov/nepa/nepapubs/Aligning_NEPA_Processes_with_Environmental_Management_Systems_2007.pdf; COUNCIL ON ENVTL. QUALITY, COLLABORATION IN NEPA: A HANDBOOK FOR NEPA PRACTITIONERS (2007), *available at* http://www.nepa.gov/ntf/Collaboration_in_NEPA_Oct_2007.pdf.

47. *See* TASK FORCE ON IMPROVING THE NAT'L ENVTL. POLICY ACT AND TASK FORCE ON UPDATING THE NAT'L ENVTL. POLICY ACT, COMM. ON RES., U.S. HOUSE OF REPRESENTATIVES, INITIAL FINDINGS AND DRAFT RECOMMENDATIONS 25–29 (2005), *available at* http://republicans.resourcescommittee.house.gov/archives/ii00/nepataskforce/report/nepareport_finaldraft.pdf (proposing NEPA amendments to, among other things, clarify certain statutory terms, and enhance participation and coordination among the public and governmental bodies and between agencies).

III. Harnessing the Power of Information to Protect our Public Natural Resource Legacy

A. The Contours of a National Environmental Legacy Act

The concept of a National Environmental Legacy Act⁴⁸ (NELA) is to give effect to the goal of defining and protecting a legacy of public natural resources⁴⁹ for future generations, something no statute has done successfully to date. Building on the goals already expressed in numerous laws, a Legacy Act would require management of public resources that accounts for the impact of our decisions on the resources available to future generations. Thus, NELA might be characterized as a successor to NEPA's legacy ambition, but with teeth and long-range vision. Embracing the Legacy Act concept would impel us to identify our long-term goals and then help chart and maintain a course to achieve our shared goals. It would also improve our decisions over the long term by generating the information base needed to support adaptive learning.

At a minimum, the idea of a Legacy Act denotes a statute that defines our public natural resource legacy and prohibits all actions that will degrade or deplete the defined legacy. These two core objectives of the statute are guideposts that suggest the general contours of the statute. We provide here the outline of a statute that could achieve these two objectives by using information effectively.⁵⁰

1. Section 1: Goals and Policy.—The statute should set out the goal of defining and preserving a legacy of public natural resources for present and future generations of Americans. In its statement of goals and policy, the statute should describe in general terms the legacy we wish to leave, defined in relation to our existing stock of resources. That legacy might be an identical stock of resources, a stock of resources that is not substantially diminished in quality or quantity, or some other description of the quantity and quality of resources we desire to preserve for future generations.

48. This Article proposes a federal statute, but the concept and design of the Legacy Act could easily be adapted for adoption as a state statute as well. As with NEPA, state analogues could serve distinct purposes. A state Legacy Act would presumably focus on protecting a legacy of state-owned and public-trust natural resources rather than federal resources.

49. For purposes of discussion, we propose a very broad definition of public natural resources that includes all water and land, as well as the ecosystems, biodiversity, and minerals found on or in them that are under federal ownership or are protected by the federal public-trust doctrine.

50. Designing the statute will require both considerable technical work and further elaboration of value choices. Although we have included section numbers for ease of reference, the sketch that follows is a starting point for discussion, not a detailed statutory proposal.

2. *Section 2: Designation of a Legacy Period.*—The statute should designate a fixed period of years that constitutes the legacy period, over which public natural resources must be conserved.⁵¹

3. *Section 3: Prohibited Degradation or Depletion of Legacy Resources.*—The statute should set forth in clear and enforceable terms the maximum level of degradation or depletion of resources that will be permitted over the course of the legacy period, if any. This is the critical, enforceable substantive standard of the statute. The statute should in clear and broad terms prohibit actions by any person,⁵² whether public or private, that may cause impermissible degradation or depletion of a legacy resource—that is, degradation or depletion that exceeds the substantive standard over the legacy period.⁵³

4. *Section 4: Designation of Legacy Resource Stewardship Agencies.*—The statute should designate an existing federal agency to serve as the resource stewardship agency (“stewardship agency”) for each public natural resource.⁵⁴

5. *Section 5: Development of Metrics and Collection of Baseline Data on Resource Quantity and Quality.*—Each stewardship agency should be charged with developing and implementing regulations that designate the appropriate metrics of quantity and quality for the resources for which they are stewards. The statute should both mandate and authorize adequate funding for collection of baseline data on the quantity and quality of all public natural resources employing these metrics.

6. *Section 6: Promulgation of Rules Defining Maximum Permitted Levels of Degradation and Depletion Over the Legacy Period.*—Each stewardship agency should be required to promulgate rules that implement § 3 of the statute by elaborating the quantity and quality of degradation or depletion of the relevant resource that would constitute impermissible

51. At the conclusion of each legacy period, a new legacy period would commence.

52. The term should be very broadly defined to include all public and private actors, including the designated stewardship agency. *See, e.g.*, Endangered Species Act of 1973 § 3, 16 U.S.C. § 1532(13) (2000) (defining the term “person” expansively to include both public and private entities, as well as “any other entity subject to the jurisdiction of the United States”).

53. For purposes of discussion, we propose that this standard proscribe all actions that will lead to significant degradation or depletion of covered resources over the legacy period, unless the proponent of action can demonstrate that substitute resources are likely to be available. NELA represents a break with most current law by shifting the burden to show the availability of substitute resources to the proponent of action.

54. Where an agency has stewardship responsibilities for a particular resource under existing law, it would seem most efficient to designate that agency for this role, unless past experience suggests this would be inconsistent with achieving the purposes of the Act.

degradation or depletion under the statute over the course of the legacy period, using the metrics developed under § 5.

7. *Section 7: Stewardship Agency Mandate to Ensure No Impermissible Degradation Will Occur (Prohibition and Planning).*—The statute should limit stewardship agencies’ discretion under existing law by requiring each stewardship agency to ensure that no degradation or depletion in excess of permissible limits will occur during the legacy period. The statute should also specifically require that each stewardship agency develop a “legacy plan” to demonstrate how it will ensure that the mandated resource legacy is conserved over the legacy period and to conform its actions to that plan.⁵⁵

8. *Section 8: Enforcement.*—To ensure enforcement, both stewardship agencies and citizens should be granted enforcement authority. A citizen-suit provision with fee-shifting⁵⁶ would be a critical component of the statute. It should authorize any person to bring an action to enjoin and seek penalties for actions that impermissibly degrade or deplete public natural resources. The statute should also permit citizen suits against the stewardship agency to enforce other agency duties under the statute, including the duties to collect information, to develop or update a legacy plan, and to conform agency actions to the terms of the legacy plan.

9. *Section 9: Monitoring and Adaptive Learning.*—The statute should require and authorize funding for stewardship agencies to undertake ongoing monitoring of legacy resources and should require agencies to update legacy plans according to a fixed schedule.

10. *Section 10: Exceptions.*—The statute should allow for a narrow exception to its prohibition on degradation or depletion in two circumstances: if it can be shown by clear and convincing evidence that (1) foreseeable technological advances or the availability of substitute resources will obviate the need for or value of the resource in question, or (2) the action is clearly in the public interest, no acceptable alternative that will not cause impermissible degradation or depletion exists that will adequately serve the public interest,

55. For those agencies that already undertake planning regarding the relevant resource, this duty should be coordinated with the agencies’ planning duties under existing enabling acts to achieve maximum efficiency in implementation. The statute should make clear that the general prohibition on actions that impermissibly degrade or deplete legacy resources applies both to private actors and to stewardship-agency decisions affecting the relevant resource—including management, permitting, leasing, and all other decisions.

56. Fee-shifting permits a judge to award costs of litigation to a prevailing party in a suit—such as a citizen suit under the Clean Air or Clean Water Acts. See, e.g., Clean Air Act § 304, 42 U.S.C. § 7604(d) (2000) (providing that a judge “may award costs of litigation” to a prevailing party in a Clean Air Act citizen’s suit).

and the impacts on the services and values to be impaired can and will be mitigated.⁵⁷

B. Harnessing the Power of Information Under a Legacy Act

This subpart elaborates on how a Legacy Act would harness the power of information, taking account of both our experiences under NEPA, described above, and the broader literature on information problems in environmental regulation. It highlights how a Legacy Act could avoid the shortcomings associated with NEPA and meet other pervasive challenges, including promoting transparency, addressing uncertainty, and overcoming information asymmetries.

1. Avoiding Excessive Open-Ended Information Demands.—The Legacy Act responds to our experiences under NEPA by ensuring that the information collected is well matched to the uses to which it is put. Information is generated by the agency for a particular decisional purpose: to define the legacy and protect it from impermissible degradation and depletion. The agency is directly required to collect baseline information for this purpose and to use this information in its planning processes. This responds to Paul Culhane's observations about the incongruity of attempting to impose a rationalist comprehensive model of information collection and analysis in a process with no goals other than assembly of complete information.⁵⁸

NELA also responds to the primary critique of the collection and use of information under NEPA—that the EIS becomes an end in itself.⁵⁹ The focus of compliance under NELA would not be the adequacy of the documentation produced, but (1) whether any planned action would cause degradation or depletion that exceeds the statutory threshold, and (2) whether agency plans would ensure compliance with the statutory standard. Review of agency and other parties' actions under the Legacy Act would therefore focus less on adequacy of particular documentation, and more on substantive compliance with NELA's central mandate—the prohibition of impermissible degradation or depletion of the legacy.

57. The standard governing exceptions could apply to two different contexts under the statute. First, it could apply in the context of an agency developing its rules under § 6 of the statute. In this context, if the agency could demonstrate by clear and convincing evidence that either prong of the exception is met with respect to a particular resource or value, the statutory mandate for preserving the resource would not apply to the extent the evidence warrants, and rules that deviated from the statutory mandate could be upheld as valid to the extent an exception was warranted. The second context would be as a defense to an enforcement action. A party subject to enforcement for impermissible degradation or depletion could defend against enforcement if the party could demonstrate by clear and convincing evidence that either prong of the exception is met regarding the action giving rise to the enforcement.

58. See *supra* note 26 and accompanying text.

59. See *supra* note 28 and accompanying text.

Under NEPA, the time-consuming nature of EIS preparation has led to a strong focus on how to avoid the need for an EIS.⁶⁰ NEPA responds to this by departing from the impact-assessment model altogether, and imposing strict liability for impermissible degradation, coupled with agency collection of baseline data and planning. NEPA does not create additional lengthy information-collection and review processes that must precede action. This should eliminate the incentive to avoid procedural compliance that has plagued NEPA.

The criticism often leveled at NEPA—that it demands too much information—could also be leveled at the requirement under the Legacy Act that relevant agencies collect and analyze baseline data and engage in ongoing monitoring. One might criticize this as creating an infinite demand for information. However, as envisioned, NEPA should not create such unrealistic or unbounded information demands.⁶¹ To avoid this problem and better define the information to be generated, we adapt an idea proposed by Sidney Shapiro and Rena Steinzor in this Symposium: the use of positive metrics that serve as shorthands for assessing the quantity and quality of resources.⁶² Shapiro and Steinzor define metrics as short and concise measures, selected by an independent body of experts, addressing the most important relevant issues and focusing on outcome rather than output.⁶³ The metrics under NEPA would be selected to assess the status of resource quantity and quality, in place of comprehensive information requirements. Notwithstanding the challenge that developing such metrics presents, there is a wealth of expertise that agencies have developed in implementing NEPA

60. See, e.g., Blumm, *supra* note 21, at 459 (reporting on a study of cases where promised mitigations, which were used to conclude that EISs were unnecessary, were later ignored); Deacon, *supra* note 39, at 153–54 (noting various agencies' broad use of categorical exemptions); Sarah McQuillen Tran, *Rebuilding Our Power Without Procedural Safeguards: A Federal Response to the 2005 Hurricanes That Outlasted the "Emergency"*, 32 HARV. ENVTL. L. REV. 217, 244–50 (2008) (criticizing FERC's broad use of categorical exemptions under NEPA following Hurricane Katrina).

61. Moreover, information on the *quantity* of certain resources may already be compiled and may be relatively well defined and simple to assemble. For example, we may have reasonably accurate estimates of the acres of forest or grasslands or the amount of certain mineral resources located on public lands. Nonetheless, even the metrics selected for the quantity of resources may require more than just crude cumulative numbers. For example, distribution of the resource may also be important to consider in some cases. In setting the metrics to be used in assessing resource quantity for forests, it would be reasonable to consider not just the existence of acres of public forests, but their distribution across the landscape and the diversity in forest types. This could be considered as an aspect of quantity or viewed as a qualitative value.

62. Professors Shapiro and Steinzor propose positive metrics in a different context—to promote agency accountability. See generally Sidney A. Shapiro & Rena Steinzor, *Capture, Accountability, and Regulatory Metrics*, 86 TEXAS L. REV. 1741 (2008) (criticizing current efforts at agency accountability and proposing positive metrics as an alternative). It would make sense to develop metrics for use in multiple contexts. A single metric might be used to monitor both agency accountability and compliance with the Legacy Act.

63. *Id.* at 1770–71.

and other resource-management and -protection statutes, and much academic expertise that could be brought to bear on the task.⁶⁴

2. *Ensuring the Quality of Information.*—NELA also seeks to address the third critique of NEPA—the uneven quality of information contained in EISs. First, the Legacy Act removes one incentive that tends to motivate collection of poor-quality or irrelevant data under NEPA—the emphasis on the *quantity* of information generated. In addition, under the design of NELA, two specific types of information are collected: (1) baseline data on the quantity and quality of resources, and (2) ongoing data to monitor the quantity and quality of resources over time. As noted above, the use of metrics would focus the collection of both types of information. Not only could the metrics determine the volume of information required to be collected, they could also provide standards for quality and promote standardization. Thus the metrics would provide guidance on the quality of the data to be collected under the Act and on the methodologies to be employed in assessing resource quality. Developing metrics under NELA should be undertaken by an independent body with relevant expertise.⁶⁵

Enactment of this new statute would provide an opportunity to take stock of new and emerging methods for assessing the quality of natural resources and the effects of human activity on the quantity and quality of natural resources. NELA should incorporate the most accurate and sophisticated tools for assessing the quantity and quality of our public resources and for predicting how proposed actions will affect public natural resources. There are many emerging analytic methods that may hold promise for developing metrics of resource quantity and quality without replicating what Professor Brad Karkkainen has called NEPA’s “seemingly insatiable demand for information.”⁶⁶ These methodologies include ecological economics, ecosystem-services valuation, energy analysis, scenario building, environmental accounting, sustainability-impact assessment, ecological-footprint analysis, and a variety of sustainability indices. While none of these may yet be fully vetted or ready or appropriate for large-scale incorporation in a legal framework, even a brief survey of the literature reflects many fundamental insights and developments in our understanding that remain largely excluded from or at the margins of current impact-

64. Professors Shapiro and Steinzor emphasize the importance of independence in the context of developing metrics for agency accountability as well. *Id.* at 1775–77. One possibility would be to provide in the statute for the creation of an interdisciplinary committee of experts to help develop the metrics, following the model of the Committee of Scientists that was created to develop regulations under the National Forest Management Act. A broader undertaking would model the Intergovernmental Panel on Climate Change or the Millennium Ecosystem Assessment. This would bring together scientists to assess the state of knowledge, determine whether consensus exists on the state of our information and analytic methods, and assess accordingly the impacts of decisions on resources.

65. *Id.* at 1775–77.

66. Karkkainen, *supra* note 25, at 920.

assessment practice. What we suggest is a focused effort to assess elements of these approaches that warrant incorporation into our analytic methods for assessing impacts on our resources.⁶⁷

For example, critics of the heavy reliance on neoclassical economics under current law and policy have pointed to the undisputed inadequacies of microeconomics to assess the impacts of decisions on resources in a world in which there are real physical limits to available resources.⁶⁸ Ecological economists introduce into decision making the norm of sustainable use of resources, alongside the neoclassical economic norm of efficiency.⁶⁹ Ecological economics offers an analytic approach well suited to more fully assessing the impacts of human activity on our resource legacy, focused as the discipline is on the intersection of dynamic human and ecosystem processes.⁷⁰

Ecosystem-services valuation offers another approach to identifying and evaluating both baselines of resource quality and the impacts of human activity on natural resources and the values and services they provide. First brought to widespread attention⁷¹ by Gretchen Daily,⁷¹ Geoffrey Heal,⁷² and Robert Costanza,⁷³ the idea of ecosystem services and its potential application has been explored by several legal scholars in the period since, most notably, J.B. Ruhl and Jim Salzman.⁷⁴ The idea that we need to better identify and assess the value of the services and values associated with natural systems fits well with the idea at the heart of the Legacy Act—that we need to better assess the impacts of our actions on public natural

67. See *supra* note 64 and accompanying text.

68. See Douglas A. Kysar, *Law, Environment, and Vision*, 97 NW. U. L. REV. 675, 676 (2003) [hereinafter Kysar, *Law, Environment*] (“[B]ecause mainstream economic accounts generally fail to recognize absolute limits imposed by nature . . . , they also fail to provide an adequate conceptual basis on which to make [required] political judgments”); Douglas A. Kysar, *Sustainability, Distribution, and the Macroeconomic Analysis of Law*, 43 B.C. L. REV. 1, 17–21 (2001) [hereinafter Kysar, *Sustainability*] (surveying examples of the limits on natural resources and waste that render the macroeconomic conception of market activity erroneous).

69. Kysar, *Sustainability*, *supra* note 68, at 6–7.

70. *Id.* at 8.

71. See NATURE’S SERVICES: SOCIETAL DEPENDENCE ON NATURAL ECOSYSTEMS (Gretchen C. Daily ed., 1997).

72. See GEOFFREY HEAL, NATURE AND THE MARKETPLACE: CAPTURING THE VALUE OF ECOSYSTEM SERVICES (2000).

73. See Robert Costanza et al., *The Value of the World’s Ecosystem Services and Natural Capital*, 387 NATURE 253 (1997).

74. E.g., J.B. RUHL, STEVEN E. KRAFT & CHRISTOPHER L. LANT, *THE LAW AND POLICY OF ECOSYSTEM SERVICES* (2007); J.B. Ruhl & James Salzman, *Ecosystem Services and the Public Trust Doctrine: Working Change from Within*, 15 SOUTHEASTERN ENVTL. L.J. 223 (2006); J.B. Ruhl & R. Juge Gregg, *Integrating Ecosystem Services into Environmental Law: A Case Study of Wetlands Mitigation Banking*, 20 STAN. ENVTL. L.J. 365 (2001); J.B. Ruhl & James Salzman, *The Law and Policy Beginnings of Ecosystem Services*, 22 J. LAND USE & ENVTL. L. 157 (2007); James Salzman, *Creating Markets for Ecosystem Services: Notes from the Field*, 80 N.Y.U. L. REV. 870 (2005); James Salzman, *A Field of Green? The Past and Future of Ecosystem Services*, 21 J. LAND USE & ENVTL. L. 133 (2006); James Salzman et al., *Protecting Ecosystem Services: Science, Economics, and Law*, 20 STAN. ENVTL. L.J. 309 (2001).

resources, broadly defined. Ecosystem-services valuation could be used to develop metrics of quality for public natural resources.

The challenges that attend systematic assessment of ecosystem services are numerous. In their recent book, Ruhl, Kraft, and Lant carefully outline the challenges and complexity of the undertaking—the tremendous variation in ecosystem services, their geographic distribution, and how users avail themselves of the services.⁷⁵ Moreover, they acknowledge that the desirability and ultimate value of the effort to translate the value of ecosystem services into dollars is contested.⁷⁶ Nonetheless, Ruhl, Kraft, and Lant provide a thoughtful assessment of the components and qualities that characterize ecosystem services,⁷⁷ a framework for conceptualizing them geographically,⁷⁸ and an outline of the key decisions that should attend any effort to operationalize ecosystem-services valuation.⁷⁹

Emergy synthesis offers another example of an emerging method of accounting for the value of natural resource systems that could be applied as a metric of environmental quality under the Legacy Act.⁸⁰ Unlike ecosystem-services valuation, emergy synthesis seeks to account for the dynamic value of natural systems by translating these into a measure of the energy embodied in the system, using the unit of emjoules. This method, developed by ecologist H.T. Odum, has been used by ecologists, as well as governmental and nongovernmental agencies, but it is only beginning to be explored as a tool for use in law.⁸¹

Ecological-footprint analysis (EFA) is an index of natural resource consumption reported in the number of global hectares necessary to support one person.⁸² While this measure does not itself seek to assess the impacts of a particular proposed action, it is possible that the analytic approach and metrics used in EFA to assess how the sum of an individual's myriad daily decisions translates into resource consumption could be employed by

75. RUHL, KRAFT & LANT, *supra* note 74, at 9, 13–35.

76. *Id.* at 31.

77. *Id.* at 23–33.

78. *Id.* at 39–56.

79. *Id.* at 249–92.

80. See Mary Jane Angelo & Mark T. Brown, *Integrating Emergy Synthesis into Environmental Law*, 37 ENVTL. L. 963, 971–74 (2007) (providing an overview of emergy synthesis).

81. See *id.* at 964–66 (discussing the origin of the concept of emergy and the aim of the article to demonstrate emergy's "potential to revolutionize environmental law").

82. Danielle Marie Devincenzo-King, *Emergy Accounting of the Resource Basis of Nations, Human Well-Being and International Debt 5* (2006) (unpublished master's thesis, University of Florida) (on file with the Texas Law Review). See also Redefining Progress, Earth Day Footprint Quiz, <http://www.myfootprint.org>. For example, the ecological footprint of one of the authors of this Article is 14 acres, compared to the average footprint of 24 acres per person in the United States. There are 4.5 biologically productive acres per person worldwide. Thus, if everyone lived like the author—with a footprint of 14 acres each—we would need 3.1 Earths to support our current world population.

agencies as they project future resource demands in their legacy plans and assess whether such demands will violate the Act.

Various emerging sustainability and well-being indices seek to assess how well countries achieve sustainable use of resources while promoting human welfare.⁸³ These may provide useful comparators, identifying other countries that may be employing alternative technology or substitute resources that can help maintain compliance with the Legacy Act.

Because NELA requires agencies to undertake planning to ensure compliance over a relatively long time horizon, it requires more rigorous consideration of anticipated cumulative impacts than is generally undertaken under NEPA and other statutes. NELA also requires a careful assessment of the capacity of renewable resources to replace themselves.⁸⁴ Several other tools that could inform agency information collection and planning that may address these demands are complexity theory, geographic information systems (GIS), and scenario building. J.B. Ruhl outlines an approach to these problems grounded in complexity theory and describes the type of algorithms we might develop to help us analyze impacts.⁸⁵ Similarly, he highlights the promise of GIS as a tool for improving our ability to analyze and understand complex information.⁸⁶ He also points to the work of others who have shown the potential of scenario building as a tool for assessing impacts.⁸⁷ Scenario building could assist agencies in developing plans that anticipate resource demands and better prepare them to face resource demands in light of the constraints imposed by the Act.

3. *Promoting Adaptive Learning.*—A major criticism of NEPA's use of information is the narrow use of information at the decision point. This limits the value of the information collected and precludes adaptive learning.

83. These indices include: the Yale Environmental Sustainability Index (YESI), see DANIEL C. ESTY ET AL., 2005 ENVIRONMENTAL SUSTAINABILITY INDEX: BENCHMARKING NATIONAL ENVIRONMENTAL STEWARDSHIP 1 (2005) ("The Environmental Sustainability Index (ESI) benchmarks the ability of nations to protect the environment over the next several decades."), available at <http://www.yale.edu/esi/ESI2005.pdf>; the United Nations Development Programme Human Development Index (HDI), see Human Development Index (HDI)—Human Development Reports (UNDP), <http://hdr.undp.org/en/statistics/indices/hdi/> (describing the HDI's method of measuring development using the indicators of life expectancy, educational attainment, and income); and the Prescott-Allen Well-Being Index (WI), see ROBERT PRESCOTT-ALLEN, THE WELLBEING OF NATIONS: A COUNTRY-BY-COUNTRY INDEX OF QUALITY OF LIFE AND THE ENVIRONMENT (2001) (creating an index that juxtaposes individuals' well-beings and environmental stress).

84. Because the statute focuses on the resources available at the end of the legacy period, the level of degradation or depletion of renewable resources permitted under the statute would take into account the resources' capacity to renew themselves over the legacy period.

85. See J.B. Ruhl, *Sustainable Development: A Five-Dimensional Algorithm for Environmental Law*, 18 STAN. ENVTL. L.J. 31, 56–58 (discussing application of "models of complex adaptive systems" to "fundamental aspects of sustainable development").

86. *Id.* at 61–62.

87. *Id.* at 59–61.

To ensure that we can learn from the experience during the legacy period, the Legacy Act should require ongoing monitoring of resources covered under the Act and regular updating of legacy plans by stewardship agencies. This would in turn provide data to help agencies and the public make informed decisions in the future and assess the accuracy of past analyses. Without this information, we would lose the opportunity to improve decision making by observing the deviation between *ex ante* predictions and actual impacts.⁸⁸ Postdecision monitoring would also permit adaptive responses in cases in which unanticipated impacts occur and thus adaptive learning.⁸⁹

4. *Creating Transparency.*—NELA's information demands should be designed with an eye toward maximizing the transparency and usefulness of the information. Thus, drafters should seek to structure information demands and analysis so that state and local decision makers, as well as interested advocates for the public interest, could benefit from the information. This also would necessitate a design that maximizes transparency, making information easily and broadly accessible. For example, the statute should mandate that baseline information and updated monitoring data be made accessible on the stewardship agency's Web site. Ensuring that the data generated under NELA are publicly available and in a form that is readily usable would promote transparency and could enhance the quality of decision making not just by federal agencies, but by state and local governments and private enterprise as well.⁹⁰ A number of the emerging analytic approaches designed above have the potential to increase transparency and facilitate ongoing use of the data collected.

5. *Addressing Information Asymmetries.*—Professor Wendy Wagner has described the classic problem of asymmetrical access to relevant information in the regulatory process.⁹¹ When a private party proposes an action that may degrade or deplete a resource, that party is likely to have greater access to information about the action it has proposed than others.⁹²

88. Karkkainen, *supra* note 25, at 938–39.

89. Holly Doremus, *Precaution, Science and Learning While Doing in Natural Resource Management*, 82 WASH. L. REV. 547, 550 (2007) (advocating a precautionary approach that incorporates adaptive learning); Karkkainen, *supra* note 25, at 938–40 (arguing that allowing adaptive-management techniques would streamline the NEPA process).

90. See Karkkainen, *supra* note 25, at 938 (discussing the benefits of process transparency to agencies, the public, and governmental branches).

91. See Wendy E. Wagner, *Commons Ignorance: The Failure of Environmental Law to Produce Needed Information on Health and the Environment*, 53 DUKE L.J. 1619, 1625–33 (2004) (describing the “ignorance equilibrium” and attributing blame to industry’s rational aversion to disclosure of information).

92. In the case of public resources, private actions approved by agencies under traditional permitting or leasing arrangements are frequently the source of degradation or depletion. In this situation, the private actor typically has greater access to information about the details of the activity it has proposed and the likely adverse impacts, creating an information asymmetry. In a typical permitting or leasing procedure, even if there is a regulatory standard that prohibits or takes

Under a regulatory scheme that prohibits conduct if adverse effects are proven, the proponent of an action has little incentive to generate or produce information about adverse effects. Hampered by the asymmetry, the agency may not know what information is available or be able to frame requests that will generate needed information.

The proposed reliance on a strong prohibition may help to alleviate this problem. Drawing on an idea from contract theory, Professor Karkkainen has explored how reliance on a “penalty default” can help to solve the problem of information asymmetries.⁹³ The Legacy Act follows this approach by employing a prohibition against degradation.⁹⁴ Thus, the statute creates an incentive for the proponent of action to investigate adverse effects of the proposed action in order to avoid strict liability for violating the statute. Further, if this inquiry generates information suggesting that an action may violate the statute, the party has an incentive to generate information on less damaging alternatives.

6. *Coping with Uncertainty.*—The obstacles that uncertainty creates for protecting natural resources, health, and safety under existing statutes are well documented.⁹⁵ Many environmental regulatory statutes require that an agency provide a certain measure of proof of harm before regulatory

negative account of anticipated degradation, the proponent has no incentive to share information on adverse effects. Even if the actor proposing a degrading or depleting activity is an agency, the agency itself may have an incentive to withhold information, creating information asymmetry between the agency and the interested public.

93. Bradley C. Karkkainen, *Bottlenecks and Baselines: Tackling Information Deficits in Environmental Regulation*, 86 TEXAS L. REV. 1409, 1419 (2008).

94. A statute that completely prohibited depletion or degradation would be the strongest form of a penalty default. Although we propose a default that permits some degradation, we follow the model that has been successfully employed under the Endangered Species Act (ESA), which prohibits conduct generally rather than establishing a permit process in the first instance. See 16 U.S.C. § 1538 (2000) (making it unlawful to possess, transport, or sell designated species). Our proposal envisions exceptions under § 10 of the Legacy Act, like § 10 of the ESA. See *id.* § 1539.

95. See John S. Applegate, *The Perils of Unreasonable Risk: Information, Regulatory Policy, and Toxic Substances Control*, 91 COLUM. L. REV. 261, 333 (1991) (concluding that the uncertainty of toxic chemicals’ effects makes it “nearly impossible to establish a level of regulatory control with any confidence in its accuracy”); Doremus, *supra* note 89, at 579 (“Dealing with uncertainty is the signature challenge of environmental and natural resource decisionmaking.”); Holly Doremus, *The Purposes, Effects, and Future of the Endangered Species Act’s Best Available Science Mandate*, 34 ENVTL. L. 397 (2004) (“Uncertainty is endemic in the ESA context. It can plague our understanding of . . . the effect of management actions on species.”); Daniel C. Esty, *Environmental Protection in the Information Age*, 79 N.Y.U. L. REV. 115, 117–18 (2004) (blaming recent failures in environmental regulation on information gaps); Howard A. Latin, *The “Significance” of Toxic Health Risks: An Essay on Legal Decisionmaking Under Uncertainty*, 10 ECOLOGY L.Q. 339, 340–42 (1982) (criticizing the Supreme Court’s response to uncertainty surrounding toxic-substance regulation); Frederic H. Wagner, *Whatever Happened to the National Biological Survey?*, 49 BIOSCIENCE 219, 219 (1999) (arguing that a national biological survey containing information on the habitats of endangered species would prevent disputes regarding use of the habitat); Wagner, *supra* note 91, at 1623–24 (arguing that despite the growth of environmental law and regulation since the 1970s, the quality of most of the air, water, and land in the United States, as well as the “breaking point” of many ecosystems, remains unknown).

constraints are imposed. Where the burden of proof falls on the agency seeking to regulate potentially harmful actions, the inevitability of incomplete and uncertain information can act as a significant impediment to regulation.⁹⁶

Given the purposes of the Legacy Act and our experience under existing law, it seems essential that the Legacy Act's prohibition be framed to adopt a precautionary approach.⁹⁷ Thus, § 3 of the statute should be framed to prohibit any person⁹⁸ from taking any action that *may* cause significant degradation or depletion of any legacy resource, or employ similar or even more precautionary language. The statute should also make explicit that any doubt created by inadequate or uncertain information should be resolved in favor of protecting the legacy, because uncertainty will frequently limit our ability to predict impacts. As Professor Holly Doremus has advocated, this precautionary approach should be coupled with adaptive learning, which can reduce uncertainty over time.⁹⁹

In addition, the statute could include a transition provision that follows the penalty-default model, designed to align the interests of resource users and the public in support of funding the collection of baseline information and the development of agency rules. The transition provision would accomplish this by imposing a partial or complete moratorium on some class of activities affecting legacy resources, pending the collection of baseline data required under the statute and the development of implementing rules.¹⁰⁰ This would ensure that lack of information does not unduly delay the statute's implementation and effectiveness. Such a transition provision would also create an incentive for private parties to share with the agencies information relevant to the development of baseline resource data, as well as giving them reason to support prompt promulgation of agency rules

96. See Applegate, *supra* note 95, at 319 (stating that because of the strict standards necessary to impose a test rule under the Toxic Substances Control Act, very few test rules have been promulgated under the statute); Latin, *supra* note 95, at 381–82 (showing that placing the burden of proof of harmful effects on an agency attempting to regulate can frustrate the purposes of environmental legislation).

97. See generally John S. Applegate, *The Taming of the Precautionary Principle*, 27 WM. & MARY ENVTL. L. & POL'Y REV. 13 (2002) (defining the precautionary principle as one that embodies the ideas that “anthropogenic harm to human health and the environment should be avoided or minimized through anticipatory, preventive regulatory controls; and, to accomplish this, activities and technologies whose environmental consequences are uncertain but potentially serious should be restricted until the uncertainty is largely resolved”).

98. The term “person” should be broadly defined. See *supra* note 52 and accompanying text.

99. See Doremus, *supra* note 89, at 548–50 (arguing that both the precautionary principle and scientific principles—sometimes thought to be in conflict with each other—should be used in an environmental decision-making process that emphasizes learning).

100. For example, any individual action that itself would be deemed significant under NEPA could be prohibited, pending the collection of the relevant information and the development of agency metrics. Defining the precise class of activities to be proscribed in this transition period would entail significant value choices.

implementing the statute, rather than favoring delay.¹⁰¹ As with the experience under California's Proposition 65 that Professor Karkkainen describes, this would create an incentive to generate information and support regulation that typical regulatory statutes lack.¹⁰²

IV. Conclusion

It is inevitable that we will leave a natural resource legacy to our children and grandchildren. This Article takes seriously the idea that Americans care about that legacy and deserve the opportunity to deliberate on the contents of their legacy. Under current law and policy, agencies are afforded broad discretion under both NEPA and substantive public natural resource-management statutes. The current legal regime fails to provide adequate tools to enable us to define and protect a natural resource legacy.

Among our current laws, NEPA is a statute both with broadly stated ambitions to protect a natural resource legacy and a commitment to harnessing the power of information to achieve that goal. In this Article, we draw on the lessons learned under NEPA to suggest how we could better harness the power of information in the service of protecting a natural resource legacy. This Article suggests that NEPA is inadequate to the task of protecting a resource legacy. Drawing on the lessons learned under NEPA, we suggest how a National Environmental Legacy Act could help us to use information effectively to define and protect a public natural resource legacy.

101. See Wagner, *supra* note 91, at 1741–42 (describing private parties' incentives to share information and to support prompt regulation under an approach similar to "penalty defaults").

102. See Karkkainen, *supra* note 93, at 1432–34 (describing how the inversion of the usual incentives for potentially regulated business leads to the disclosure of information).

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