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## NATURAL RESOURCE DAMAGES FROM RACHEL CARSON'S PERSPECTIVE: A RITE OF SPRING IN AMERICAN ENVIRONMENTALISM

PETER M. MANUS\*

### I. INTRODUCTION

*[T]he old ideas die hard, especially when they are emotionally as well as intellectually dear to one. It was pleasant to believe, for example, that much of Nature was forever beyond the tampering reach of man . . . comforting to suppose that the stream of life would flow on through time in whatever course that God had appointed for it . . . . These beliefs have almost been a part of me for as long as I have thought about such things. To have them even vaguely threatened was so shocking that . . . I shut my mind . . . . But that does no good, and I have now opened my eyes and my mind.<sup>1</sup>*

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1. Letter from Rachel Carson to Ruth N. Anshen (Jan. 30, 1958), in PAUL BROOKS, *THE HOUSE OF LIFE: RACHEL CARSON AT WORK* 9-10 (1972).

In October 1994, the *New York Times* predicted that the 103d Congress would fail in its efforts to amend the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund),<sup>2</sup> a major environmental statute that had been slated for amendment that term.<sup>3</sup> Had Cassandra, Greek mythology's misunderstood clairvoyant, been around to offer such a prediction, she might have broken her curse against being believed;<sup>4</sup> the Democratic Congress's failure to revamp CERCLA in its final days of majority was a foregone conclusion.<sup>5</sup> Indeed, for some time now, environmental advocacy has

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2. 42 U.S.C.A. §§ 9601-9675 (West 1995).

3. John H. Cushman, Jr., *Few Environmental Laws Emerge from 103d Congress*, N.Y. TIMES, Oct. 3, 1994, at B12. The article quotes Sierra Club lobbyist Blakeman Early as characterizing the 103d Congress as "the worst environmental Congress in two decades" and discusses the political momentum against environmentally benign legislation and in favor of property owners and business interests. *Id.* The article also describes congressional criticism of the Clinton Administration and "the environmental movement itself" for "not exercising enough muscle at the grass roots to mobilize votes in Congress." *Id.*

4. Indeed, in Aeschylus's *Agamemnon*, Cassandra, a prophetess who suffered a curse of having her visions ignored, sounds like an early Rachel Carson in her opening lines: "[w]oe, woe, alas! Earth, Mother Earth!" Aeschylus, *Agamemnon*, in SEVEN FAMOUS GREEK PLAYS 48, 89 (Whitney J. Oates & Eugene O'Neill, Jr. eds., 1950). Carson herself was aware that when she wrote in defense of natural resources she would be cast as "a Cassandra." BROOKS, *supra* note 1, at 214.

5. See, e.g., Gary L. Countryman, *Cleaning Up Superfund Program*, BOSTON GLOBE, Feb. 7, 1995, at A44. The author argues for Superfund overhaul, including the repeal of strict joint and several liability for waste disposed prior to 1987, the reform of cleanup standards to focus on human health risks, and a review of cleanup funding to ensure fairness. *Id.* The article appears to advocate that such reforms will eliminate inefficiency in Superfund, such as lawyer transaction costs, but fails to explain how, for example, replacing joint and several liability with allocated liability will necessarily reduce litigation. Such articles serve as strong indicators that Superfund reauthorization will be a complex process encumbered by naive, ill-conceived reform proposals.

The Clinton Administration nevertheless attempted to build consensus and avoid confrontation on environmental issues. See John H. Cushman, Jr., *Congress Forgoes Its Bid To Hasten Cleanup of Dumps*, N.Y. TIMES, Oct. 6, 1994, at A1.

The consensus approach[, however,] had been tried with mixed results on other thorny issues, like logging and grazing on public lands, and with each compromise the Administration had paid dearly in its standing among environmentalist allies . . . . In the end, though, no amount of consensus-building could build enough momentum to send the bill vaulting over the final hurdle of partisanship.

*Id.* at A22.

been losing all vestiges of bipartisan urgency,<sup>6</sup> reducing those who champion nature to mere Democratic politicians with "green agendas" and rendering them vulnerable to a familiar arsenal of accusations of overregulation and taxing and spending.<sup>7</sup> One explanation for this evolution in environmental politics is that Americans are simply too selfish to sustain a pro-environment attitude once the warm glow of nature-love wears off and the chore of trash recycling becomes tedious.<sup>8</sup> A less pessimistic explanation for environmentalism's slipping bipartisan status is that, now that environmentalism has forged an indelible place for itself as an issue that demands political attention, it has begun using its newly developed political muscle to further infiltrate the system, rather than stiff-arming mainstream politics to maintain the stance of the apolitical purist.<sup>9</sup>

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6. See 140 CONG. REC. H176 (daily ed. Feb. 2, 1994) (statement of Rep. Boehlert) ("The Republican Heritage for the Environment dates back to President Teddy Roosevelt, and I would remind my colleagues that it was a Republican President, Richard Nixon, under whose leadership the Environmental Protection Agency was created.").

7. See, e.g., *Congressional Republicans Take Aim at Extensive List of Environmental Statutes*, N.Y. TIMES, Feb. 22, 1995, at A14. The article quotes the Speaker of the House of Representatives, Newt Gingrich, as deriding the nation's environmental policies because they are "absurdly expensive, creat[ing] far more resistance than [is] necessary and misallocat[ing] resources." *Id.*; see also Cushman, *supra* note 3, at B12 (observing that "[o]nly recently did . . . partisanship[ ] really take hold [as a force against environmentalism]" and quoting a Clinton Administration official as stating that "if the Republican leader [Senator Robert Dole of Kansas] decides that he does not want to move something, no matter how much the people back home want something, there is nothing we can do about it"); *Review & Outlook: Running on Fumes*, WALL ST. J., Oct. 3, 1994, at A20 (referencing the Clean Air Act Amendments of 1990 as an example of "why we so need to rein in overzealous regulators").

8. See, e.g., Timothy Aepfel, *Not in My Garage: Clean Air Act Triggers Backlash as Its Focus Shifts to Driving Habits*, WALL ST. J., Jan. 25, 1995, at A1. "As long as the fight for cleaner skies focused on big smokestacks, few people cared. They figured big companies could afford to make changes. But clean air rules are now biting into everyday life because they tackle a broader range of pollution problems, [causing] . . . intense backlash . . ." *Id.* The article also discusses the efforts of Republicans and conservative Democrats to revise the Clean Air Act to make it less intrusive and notes Republican vows to ease other environmental laws, including the Endangered Species Act. *Id.*

9. See Scott Allen, *Greenhorns No Longer—Pro-environmental Political Party Aiming for National Status*, BOSTON GLOBE, Feb. 14, 1995, at A17. Discussing the Green Party, the article notes that "the Greens began as a protest movement . . . that viewed electoral politics as a sellout" and observes that, now that the party is seeking mainstream political status, "the Greens have already been charged with their

Signs of the systemization of environmentalism may be identified readily. The Endangered Species Act (ESA), once the prototype of uncompromising roadblock environmentalism, now relegates the fates of dwindling lifeforms to a political committee.<sup>10</sup> The Clean Air Act (CAA) borrows from a financial model, auctioning transferable allowances to emit sulfur dioxide like stock market commodities.<sup>11</sup> CERCLA, which once shunned fairness in favor of cleanup, now places a potentially heightened burden on government plaintiffs to allocate cleanup costs among defendants, rather than relying on joint and several liability to rest the burden of apportioning cleanup costs on the shoulders of those defendants easiest to identify or best able to pay.<sup>12</sup> Perhaps the most prominent symbol that environmentalism is evolving into just another facet of mainstream American politics is the Clinton administration's effort, albeit thus far not fully achieved, to "elevate" the United States Environmental Protection Agency (EPA) Administrator to Executive Cabinet status.<sup>13</sup> Under former EPA Administrator William K. Reilly, EPA might have been described as a "quasi-independent" executive agency.<sup>14</sup> One can only wonder what kind of turn the United States

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first flip-flop, to use a politics-as-usual term." *Id.* The article cites John Rensenbrink, a Bowdoin College political science professor who founded Maine's Green Party, as arguing that the Greens are not leftist and that they enjoy five-percent support among Republicans. *Id.*

10. Endangered Species Act, 16 U.S.C. § 1536(e) (1988) (establishing the Endangered Species Committee, an executive branch committee authorized to grant exemptions from the Act's general prohibition of government projects likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction or adverse modification of a habitat of such a species).

11. Clean Air Act, 42 U.S.C. § 7651(b) (Supp. V 1993); *see also* 40 C.F.R. pt. 73 (1994) (implementing 42 U.S.C. § 7651).

12. *See* H.R. 4916, 103d Cong., 2d Sess. § 413 (1994) (making the United States Environmental Protection Agency responsible both for identifying parties eligible for expedited settlement and for allocating cost liability earlier and more frequently). Presently, CERCLA does not specify whether liability is to be joint and several or apportioned. Courts have concluded, however, that CERCLA permits joint and several liability, but that liability may be apportioned where appropriate. *See, e.g., United States v. Chem-Dyne Corp.*, 572 F. Supp. 802 (S.D. Ohio 1983).

13. *See* 140 CONG. REC. H171-73 (daily ed. Feb. 2, 1994) (debating H.R. 3425). The effort has stalled over, among other issues, the question of whether the bill creating the Department of the Environment should be amended to create a right of citizens to demand compensation when environmental regulation results in a taking of private property. *See, e.g., id.* at H178 (statement of Rep. Merger).

14. *See, e.g., One Last Attack on Wetlands*, ST. LOUIS POST-DISPATCH, Nov. 15,

environmental program would take under a president with a strong laissez-faire agenda, who would exercise the same degree of control over the nation's chief environmental administrator as he would exercise over a member of the Cabinet.<sup>15</sup>

The question remains, however, whether the evolution of American environmentalism toward mainstream law and politics fatally compromises its essential ideals and, if it does, whether a shift toward the mainstream is essential for environmentalism's survival as an important political subject.<sup>16</sup> Perhaps no social cause is able to maintain the pure standards of the challenger in the long term.<sup>17</sup> Undeniably, environmental law has enjoyed a healthy political coalescence, fusing scattered statutes and common-law causes of action addressing nature—often with their primary focus on regulating navigation and sea-harvesting or protecting public health and safety—into the present regime of sternly administered and stunningly expensive cleanup laws. The future will show whether environmental law will develop a law and government structure that not only considers, but is based upon, the long-term survival of the ecosystem or whether the American conscience and pocketbook have reached their political saturation point for environmental responsibility.<sup>18</sup>

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1992, at 2B ("Mr. Reilly, a true environmentalist in an administration that is callous on such issues . . . has a history within the Bush administration of being more favorable toward the environment than Mr. Quayle and other conservatives.").

15. See S. 533, 102d Cong. 1st Sess. (1991). The Department of the Environment Act of 1991, proposed during George Bush's presidency, would have elevated the Environmental Protection Agency to Cabinet level.

16. See, e.g., Scott Allen, *Murky Times for Environmentalism—Economy, Crime Overtake What Was To Be Cause of '90s*, BOSTON GLOBE, Nov. 12, 1994, at 1 (quoting John Clarke, director of advocacy at the Massachusetts Audubon Society, who observed that "[w]e peaked with the recelebration of Earth Day").

17. *Id.* at 28 (noting how environmentalism is the victim of its own success, both by achieving initial victories that lull the population into considering environmental problems resolved and by spawning organized foes, such as the "Wise Use" movement); see also Robert Braile, *What the Hell Are We Fighting For?*, GARBAGE, Fall 1994, at 28, reprinted in *Blowin' in the Wind*, UTNE READER, Jan.-Feb. 1995, at 83 (describing "an embattled movement" struggling "to articulate a vision of sustainable environmentalism").

18. The future of environmentalism may lie in the success or failure of the "Contract with America," which makes no mention of environmental issues, but which is fiercely antiregulation and presents a grave risk to environmentally protective federal programs. See, e.g., H.R. 1022, 104th Cong., 1st Sess. (1995) (The Risk Assessment

Perhaps the environmentalist, like the cautious feminist who is forever gauging the position of women's issues on the ever-revolving popular cycle of pro- then anti-feminism, must focus on the national tolerance for the once nonexistent and now ubiquitous cause of environmentalism and realize that the threat of major backlash necessitates some efforts to establish roots in mainstream politics, even if such efforts require a compromise of principles.<sup>19</sup>

From this perspective, a single political or legislative development might simultaneously represent both a step away from the ideals of environmentalism and a step toward securing a permanent place for environmental issues in American politics. An example of this compromise between idealism and pragmatism is the developing law of natural resource damages (NRD).<sup>20</sup> While NRD law may sacrifice some of the breadth and power of

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and Cost-Benefit Act of 1995); see also Scott Allen, 'Contract' Reframes Issue of Environment's Worth, BOSTON GLOBE, Feb. 6, 1995, at 25 (describing "the biggest environmental battle in Washington since the early years of the Reagan era"); Jill Zuckman, 50 Days Are a Breeze for House GOP, But Storms Are Predicted, BOSTON GLOBE, Feb. 22, 1995, at 8 (reviewing the more politically sensitive "Contract" issues).

19. Cf. SUSAN FALUDI, BACKLASH: THE UNDECLARED WAR AGAINST AMERICAN WOMEN xviii, xxi-xxii (1992). Faludi's explanation of the political backlash against feminism might equally describe the present political climate against environmentalism:

The backlash is at once sophisticated and banal, deceptively "progressive" and proudly backward. It deploys both the "new" findings of "scientific research" and the dime-store moralism of yesteryear; it turns into media sound bites both the glib pronouncements of pop-psych trend-watchers and the frenzied rhetoric of New Right preachers.

.....  
The force and furor of the backlash churn beneath the surface, largely invisible to the public eye. . . .

The backlash is not a conspiracy, with a council dispatching agents from some central control room . . . . For the most part, its workings are encoded and internalized, diffuse and chameleonic. Not all of the manifestations of the backlash are of equal weight or significance either; some are mere ephemera, generated by a culture machine that is always scrounging for a "fresh" angle.

.....  
Although the backlash is not an organized movement, that doesn't make it any less destructive. In fact, the lack of orchestration, the absence of a single string-puller, only makes it harder to see—and perhaps more effective.

*Id.* at xviii-xxii.

20. See *infra* part III.

certain other environmental liability schemes, it also nudges the law forward, toward systemized recognition of heretofore unacknowledged environmental values and ideals.

Professor Zygmunt J.B. Plater has coined the term "the Rachel Carson Paradigm" to describe an environmentalist perspective that attained popular status in the early sixties, in part through the influential writing of Rachel Carson.<sup>21</sup> In *Silent Spring*, Carson explained how decisions involving chemical applications to the environment necessitate consideration of longer term and broader ranging effects than the effects traditionally considered under the laissez-faire economic cost-benefit model generally utilized in a free market system.<sup>22</sup> More broadly, however, Carson's work evokes the type of moral thinking that transcends both law and economics.<sup>23</sup> Her discourse takes heed of the perspectives of the aesthete and the scientist to arrive at a logical synthesis of concerns and goals, free of law and politics, that serves as the best widely read example of true environmentalist thinking available today.<sup>24</sup> For these reasons, Rachel

21. Zygmunt J.B. Plater, *From the Beginning, A Fundamental Shift of Paradigms: A Theory and Short History of Environmental Law*, 27 LOY. L.A. L. REV. 981 (1994). Although Plater's Paradigm might be termed an "environmentalist perspective" because it is a perspective that is essential to environmentalist thinking and is aptly symbolized by Carson, the paradigm Plater identifies is more accurately described as a sociopolitical state of mind that takes a broader and longer-ranging account of nonmarket consequences flowing from human activities. See *infra* notes 30-34, 305 and accompanying text.

22. RACHEL CARSON, *SILENT SPRING* (1962).

23. BROOKS, *supra* note 1, at 8 (Rachel Carson "had the broad view of the ecologist who studies the infinitely complex web of relationships between living things and their environment."); see CAROL B. GARTNER, *RACHEL CARSON* 102 (1983).

[*Silent Spring*] is a highly political book, urging profound reorientation of beliefs, attitudes, and practices on the part of both governments and the public. Such sweeping reassessment threatened the economic interests of powerful corporations and all those they supported in industry, government agencies, and universities. It could and did lead to governmental actions to control the use of pesticides.

*Id.*

24. See GARTNER, *supra* note 23, at 124-25.

People have put Rachel Carson into many categories—among them, poet, scientist, conservationist—but these were not separate identities for her. Just as the concept of ecological interrelationships was a cornerstone of her philosophy, so her organizing principle was integration . . . .



Carson's philosophy is the prototype against which trends in environmental law and politics should be measured to assess our progress along the evolutionary continuum toward a true environmentalist perspective.

NRD restoration is a concept codified in CERCLA from its inception.<sup>25</sup> In essence, the NRD provisions of CERCLA hold CERCLA defendants liable for the injuries to flora, fauna, and other aspects of nature that are not fully addressed under existing cleanup provisions.<sup>26</sup> NRD also allows the law to account for the lost enjoyment and other lost uses of natural resources that humans suffer due to pollution and the time necessary to clean up pollution.<sup>27</sup> Even in this brief sketch of NRD, one may discern that the law of NRD conceivably could stand as a significant example of law constructed in the mode of the Rachel Carson Paradigm. NRD law has direct and real potential to translate into financial liabilities the long-term, broad ranging, and aesthetic effects of human activities on nature.

During 1994, two agencies charged with the responsibility of implementing the NRD provisions of several major federal environmental statutes published final and draft rules addressing NRD implementation.<sup>28</sup> This Article examines those NRD programs and certain major legal battles that have emerged in the NRD area. Ultimately, this Article focuses on what the development of NRD law indicates about United States progress toward a fuller assimilation and adoption of Rachel Carson's environ-

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[As she stated,] "the more clearly we can focus our attention on the wonders and realities of the universe about us the less taste we shall have for the destruction of our race."

*Id.* (quoting Rachel L. Carson, Design for Nature Writing, Remarks Made on Acceptance of the John Burroughs Medal (Apr. 7, 1952)) (transcript in the Rachel Carson papers, Rachel Carson Council (formerly Rachel Carson Trust for the Living Environment), Washington, D.C.)).

25. See *infra* note 180 and accompanying text.

26. See *infra* note 180 and accompanying text.

27. See *infra* notes 173, 276 and accompanying text.

28. 59 Fed. Reg. 14,262, 14,262-88 (1994) (to be codified at 43 C.F.R. pt. 11) (stating the Department of the Interior's final rule implementing NRD under CERCLA and the Clean Water Act); 60 Fed. Reg. 39,804 (1995) (to be codified at 15 C.F.R. pt. 990) (proposed Aug. 3, 1995) (proposing the National Oceanic and Atmospheric Administration's (NOAA) rule for implementing NRD under the Oil Pollution Act of 1990 (OPA)); see *infra* notes 169, 212 and accompanying text.

mental philosophy.

Part II of this Article presents the Author's view of Carson's philosophy, utilizing the Rachel Carson Paradigm as the motivation for an examination of Carson's works. Part II identifies three primary philosophical concepts that Carson stressed in her writing: her belief that people have a right to live unassaulted by toxins; her belief that maintaining a diverse web of life is the key to ecological survival; and her belief that environmental preservation is a moral human instinct. Part II then engages in a general survey of how and where certain principles of Carson's philosophy are either reflected or rejected in modern environmental law.

Part III presents an overview of NRD law, primarily through a brief sketch of the modern law of NRD as reflected in CERCLA and the efforts of the Department of the Interior (DOI) to craft NRD regulations implementing the CERCLA NRD cause of action.

Part IV engages in an analysis of where NRD law reflects the various aspects of Carson's philosophy identified in Part II, and where NRD law falls short or retreats from environmental achievements in other laws. Part IV determines that NRD represents progress toward environmental thinking as idealized by Carson, while also evidencing a significant amount of renewed sensitivity toward some very non-Carsonian legal ideas. The result is an area of law that moves forward conceptually while imposing on itself procedural legal constraints that are not characteristic of environmental law in general.

Part V reprises Professor Plater's Rachel Carson Paradigm, discusses his ultimate theory that environmentalists must maintain the stance of political system challengers, and agrees that maintaining the adversarial posture Carson assumed in *Silent Spring* may be essential in spite of our efforts to protect the environment within the political-economic system. This Article concludes that NRD developments, when combined with other legislative, judicial, and political incidents, may indicate signs of a backlash against Carson's form of environmentalism, but that the mainstreaming and compromising of environmental ideals in American law and politics does not relegate Rachel Carson's philosophy to the graveyard of lost ideals.

## II. RACHEL CARSON'S PHILOSOPHY: PLATER'S PARADIGM EXPLORED

*[We live in] an era dominated by industry, in which the right to make a dollar at whatever cost is seldom challenged.*<sup>29</sup>

As Professor Plater has observed, in *Silent Spring* Rachel Carson advocates that decisionmakers work to identify environmental effects of decisions that are latent, or external to market-based analysis, and to "take comprehensive account of the real, interacting consequences . . . of decisions."<sup>30</sup> Professor Plater's image is accurate if not lyric, as part of its power lies in the fact that it is so readily grasped by anyone who has dipped, even cursorily, into *Silent Spring*. Plater's Rachel Carson Paradigm also provides a model against which environmentally related behavior, including laws and their interpretation, may be gauged. A more environmentally sound law or policy would adhere to the Paradigm by internalizing externalities, forcing human actors to take into account the continuing, long-term consequences of their actions.<sup>31</sup>

Plater's leading example of a law embracing the Paradigm, and perhaps the clearest example of a federal law that internalizes environmental impacts into cost-benefit decisionmaking, is the

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29. CARSON, *supra* note 22, at 13.

30. Plater, *supra* note 21, at 982, 989-90, 998-1000. Plater refers to this as "expanded accountings" and "Carson-style accountings" and writes that "Rachel Carson spread a broad intellectual catch-basket beneath the Coasian welfare economists' universe of benefit-maximizing individual actors, so as to collect and take overall account of their jettisoned 'externalized' social costs, even if they are indirect and unmarketized." *Id.* at 998.

31. This Article briefly considers whether environmental law internalizes externalities. The subject of environmental law as a means of internalizing externalities is handled thoroughly, and certainly as well as this Author could hope to handle it, by Plater. See Plater, *supra* note 21. By casting environmental damages as external costs, economic cost-benefit analyses arrive at decisions that cause environmental harms and ultimately prove unwise, even in economic terms. As Professor Plater points out, environmental laws, with their regulatory costs and costly liability schemes, bring environmental considerations into the cost-benefit analysis process, thus internalizing to commercial decisionmakers harms to the environment or at least partially harmonizing economic decisionmaking and environmental degradation resulting from human activities. *Id.* at 988-89.

National Environmental Policy Act (NEPA).<sup>32</sup> Introduced in 1969 as the first of the major modern environmental statutes, NEPA imposes an obligation on federal government actors to consider the effects of their major actions on the natural environment.<sup>33</sup> NEPA thus serves as a direct and simple translation of the economic facet of the Rachel Carson Paradigm into law. Subsequent judicial interpretations limiting the scope and effect of NEPA, however, illustrate the political shift away from the Paradigm.<sup>34</sup>

*Silent Spring* is more than a manifesto for the internalization of externalities. In *Silent Spring*, and in her writing in general, Carson advocates far more than the expansion of cost-benefit analysis to incorporate environmental impacts of private actions.<sup>35</sup> Indeed, Carson's writing reveals a number of philosophical principles—truths to Carson—that are integral to some of the more familiar, controversial, and unique features of modern environmental law. Although Carson's writings do not focus on law, her studies of the effects of pesticides on soil, aquatic and coastal ecosystems, and various lifeforms provide food for thought about how legal concepts such as fault, retroactivity, and causation are best utilized in an environmentally conscious world.

This section explores Carson's works to identify elements of her paradigmatic perspective that define environmentalism, and against which current environmental law may be gauged. The first of Carson's philosophical truths discussed below is her

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32. 42 U.S.C. §§ 4321-4370d (1988 & Supp. V 1993); see Plater, *supra* note 21, at 989. Plater counts 34 statutes passed within three years of NEPA's passage that "wittingly or unwittingly reflected Rachel Carson's teachings, addressing ecological and economic values and problems that had not been acknowledged or had been inadequately accounted for in previous public and private laws." *Id.* at 1002-03.

33. See 42 U.S.C. § 4332(2)(C).

34. See *Strycker's Bay Neighborhood Council, Inc. v. Karlen*, 444 U.S. 223, 228 (1980) ("In the present litigation there is no doubt that [the government actor] considered the environmental consequences of its decision to redesignate the proposed site for low-income housing. NEPA requires no more.").

35. This Article in no way intends to argue or imply that Professor Plater has failed to accurately or completely define Rachel Carson's contributions to environmentalism. In fact, this further exploration of Carson's philosophy and its application to law is solely and fully derived from the Paradigm as devised by Plater. See Plater, *supra* note 21 and accompanying text; *infra* note 305 and accompanying text.

belief that humans have the right to an environment free from private or government applications of life- and habitat-threatening toxins.<sup>36</sup> A second conviction expressed in Carson's writing is that the responsibility of environmentalism and ultimate savior of a healthy earth is the preservation and maintenance of varied and well-dispersed biological species and habitats.<sup>37</sup> Elemental to this conviction is Carson's awareness of the interconnectedness of all the elements of Earth's ecosystem. The third of Carson's philosophical themes discussed below is her belief that humans bear a moral, emotional, naturally evoked instinct to preserve nature simply because nature exists.<sup>38</sup>

#### A. *The Right To Live Unpoisoned*

*If the Bill of Rights contains no guarantee that a citizen shall be secure against lethal poisons distributed either by private individuals or by public officials, it is surely only because our forefathers . . . could conceive of no such problem.*<sup>39</sup>

Carson believed that persons have the right to live in an environment that has not been polluted by the purposeful acts of others. In both her spoken communications and in her writing, she tended to express this belief in simple, firm language and voice, perhaps ingenuous in her use of the term "rights" without a reference to law and perhaps more assured in her ability to make a statement without the crutch of a footnote.<sup>40</sup> Throughout *Silent Spring*, in which Carson advocates her scientific views in an adversarial manner reminiscent of legal writing, she argues for a human right to live unassaulted by chemicals.<sup>41</sup>

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36. See *infra* parts II.A.1, II.A.3.

37. See *infra* part II.B.1.

38. See *infra* part II.C.1.

39. CARSON, *supra* note 22, at 12-13.

40. Indeed, Carson was acutely aware that the right to a toxin-free environment bore no support from the law. During the Senate Hearings on pesticide use, sponsored by Senator Abraham Ribicoff of Connecticut, Carson stated, "I speak not as a lawyer, but as a biologist and as a human being, but I strongly feel that [the right of the citizen to be secure in his own home against the intrusion of poisons applied by other persons] is or should be one of the basic human rights." American Experience (PBS television broadcast, Feb. 8, 1993) (transcript No. 511, at 16).

41. CARSON, *supra* note 22, at 12-13. Carson uses the terminology of legal advo-

The law offers no easily identified support for Carson's assertions regarding the right to live without pollutants. No express right to a clean environment appears in the Constitution,<sup>42</sup> nor have any of the rights associated with personal privacy and property been interpreted to advance an absolute right to live in an unpolluted environment.<sup>43</sup> Instead, the constitutional authority to regulate the environment has been recognized primarily, and rather unphilosophically, through the Commerce Clause.<sup>44</sup> While the Commerce Clause is arguably a logical foundation for environmental law because of the need for uniformity in environmental regulation and the fact that the regulated community is comprised primarily of players in interstate commerce, the fact that environmental law has its genesis in the Commerce Clause provides no legal support for Carson's philosophical view that people have a basic right to live a life free of the purposeful governmental intrusion of toxins. Indeed, a per-

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cacy as well, ending one chapter with several statements of her position on pesticide applications that begin, "I contend." *Id.* In a chapter cataloging the history of the haphazard destruction humans have visited on nature, Carson presents the arguments of conservationists and government agencies as if to a jury and identifies members of society who have been denied a "legitimate right" to access nature due to the application of pesticides. *Id.* at 86.

42. Courts have rejected arguments that the Ninth Amendment offers a constitutional basis for the right to a clean environment. *See, e.g., Tanner v. Armco Steel Corp.*, 340 F. Supp. 532, 535 (S.D. Tex. 1972) (holding that "[t]he Ninth Amendment, through its 'penumbra' or otherwise, embodies no legally assertable right to a healthful environment").

43. Indeed, the property right against intrusive regulation without compensation, found in the Constitution's Taking Clauses, U.S. CONST. amends. V, XIV, has emerged as a formidable weapon against environmental regulation affecting private property. *See, e.g., Dolan v. City of Tigard*, 114 S. Ct. 2309 (1994); *Lucas v. South Carolina Coastal Council*, 112 S. Ct. 2886 (1992).

44. *See, e.g., Hodel v. Virginia Surface Mining & Reclamation Ass'n*, 452 U.S. 264, 282 (1981) (holding that the Commerce Clause is broad enough to permit congressional regulation of activities causing air or water pollution); *United States v. Union Gas Co.*, 832 F.2d 1343, 1351 (3d Cir. 1987) (holding that Congress has power under the Commerce Clause to abrogate states' Eleventh Amendment immunity against lawsuits under CERCLA), *aff'd sub nom. Pennsylvania v. Union Gas Co.*, 491 U.S. 1 (1989); *United States v. Ashland Oil & Transp. Co.*, 504 F.2d 1317, 1329 (6th Cir. 1974) (holding that, through its interstate commerce powers, Congress may prohibit discharge of pollutants into non-navigable tributaries of navigable streams); *Wickland Oil Terminals v. Asarco, Inc.*, 654 F. Supp. 955, 957 (N.D. Cal. 1987) (holding that Congress can abolish the states' immunity when exercising its authority under the Commerce Clause).

ceived connection between interstate commerce and environmental regulations may be at work in certain landmark environmental law cases that prohibit parties suffering from pollution from using the common law of nuisance to combat pollution sources.<sup>45</sup> The constitutional foundation of environmental law thus may actually serve as a weapon against Carson's perceived right to a clean environment.<sup>46</sup>

### *1. Carson's Ideal: A Property Right in a Nontoxic Environment*

Carson was not ignorant of the law's inadequate support of those who would save the environment from chemical poisoning. In *Silent Spring*, Carson refers to *Murphy v. Benson*,<sup>47</sup> an action, in which Carson played a role, that was brought against government pesticide sprayers in New York. The dispute involved a United States Department of Agriculture Plant Pest Control Division program to blanket spray dichloro-diphenyl-trichloro-ethane (DDT) diluted with fuel oil over several million acres of United States land per year, with the goal of "eradicating" the gypsy moth.<sup>48</sup> Ornithologist Robert Cushman Murphy led a group of Long Island citizens in an attempt to obtain a court injunction against the spraying of their land. The citizens claimed infringements of the Fifth and Fourteenth Amendments to the United States Constitution for the deprivation of property, and possibly lives, without due process, the taking of private property for public use without just compensation, and the tortious and illegal trespassing upon the persons and property of

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45. See, e.g., *International Paper Co. v. Ouellette*, 479 U.S. 481 (1987). In denying the plaintiffs' right to apply Vermont nuisance law to a New York pulp and paper mill regulated under the CWA, *id.* at 497, the Court revealed a high level of sensitivity to the commercial industry's need for efficiency and predictability in the regulatory standards that apply to its discharge of waste into interstate waterways and less sensitivity to the environmental problems suffered by downstream receptors.

46. See, e.g., *Arkansas v. Oklahoma*, 112 S. Ct. 1046 (1992) (examining whether an upstream state and the EPA had complied with the CWA permit process before allowing wastewater discharges that were the source of downstream state's water pollution problems).

47. 151 F. Supp. 786 (E.D.N.Y. 1957), *vacated as moot in part, aff'd in part*, 270 F.2d 419 (2d Cir. 1959), *cert. denied*, 362 U.S. 929 (1960).

48. CARSON, *supra* note 22, at 157.

the plaintiffs in a manner causing irreparable damage.<sup>49</sup>

Although Carson would later describe the case as having been lost on a technicality,<sup>50</sup> the district court claimed to base its denial of the injunction against spraying on a balanced review of affidavits submitted to the court in which "the plaintiffs have not presented persuasive evidence that the threat of irreparable damage to them is in excess of that which would probably be visited upon the community in general, if a temporary injunction were to be granted as sought."<sup>51</sup> The court's tone is significant to our examination of the law's effectiveness in protecting an individual's right to a chemical-free existence. The court expressed respect for the plaintiffs' grievance, characterizing it as being "of such a nature that full and complete opportunity must be afforded to them to establish by legal evidence the existence of the conditions of which they complain."<sup>52</sup> Yet, the court found that the irreparable threat DDT posed to the plaintiffs' health and organic farming operations did not constitute sufficient evidence of trespass or any other property right infringement to warrant a temporary injunction.<sup>53</sup>

Justice William O. Douglas, whose view of the law's place in protecting the environment is quoted often by Carson,<sup>54</sup> dis-

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49. *Murphy*, 151 F. Supp. at 789.

50. BROOKS, *supra* note 1, at 239. Carson was undoubtedly referring to the court of appeals decision to dismiss as moot the action for a permanent injunction. See *Murphy v. Benson*, 270 F.2d 419, 421 (2d Cir. 1959), *cert. denied*, 362 U.S. 929 (1960).

51. *Murphy*, 151 F. Supp. at 792.

52. *Id.* at 789.

53. *Id.*

54. See, e.g., CARSON, *supra* note 22, at 72. Carson relates a story in which Justice Douglas attended a meeting of federal officials discussing protests against the programmatic destruction of sagebrush.

These men considered it hilariously funny that an old lady had "opposed the plan because the wild flowers would be destroyed.

Yet was not her right to search out a painted cup or a tiger lily as inalienable as the right of stockmen to search out grass or of a lumberman to claim a tree?" asks this humane and perceptive jurist. "The aesthetic values of the wilderness are as much our inheritance as the veins of copper and coal in our hills and the forests in our mountains."

*Id.* (citing WILLIAM O. DOUGLAS, *MY WILDERNESS: THE PACIFIC WEST* 160 (1960)).

The admiration was mutual. See BROOKS, *supra* note 1, at xi-xii (quoting Justice William O. Douglas as predicting that *Silent Spring* would become "the most impor-



sented from the Supreme Court's denial of certiorari in *Murphy v. Butler*.<sup>55</sup> He drew from the facts of *Murphy* a number of traditional-sounding claims of property infringements, citing evidence of a dairy from which milk contaminated by pesticides could not meet federal and state regulations, several instances of vegetable and fruit produced for consumption or sale having been rendered inedible, and instances of fish owned by petitioners having been killed.<sup>56</sup> Moreover, Justice Douglas cited effects of spraying not linked to direct property claims, such as the killing of birds and predatory insects. He urged the Supreme Court to hear the *Murphy* appeal, thus indicating that he believed that law may be used to protect more than just the environment over which a plaintiff is able to establish a private property interest.<sup>57</sup> The fact that Justice Douglas's strongly stated pro-environment sentiments were published in a dissent—indeed, a dissent to a denial of certiorari—may have helped Carson to understand that her perceived right to live unbombarded by toxic chemicals had no firm foundation in law in the early 1960s.

## 2. *The Law's Response to Carson's Ideal: Citizens' Suits and the Rise of Takings Cases*

The legal generation since Carson's death has responded with mixed sentiments to her ideal that American citizens have a legal right to be secure against indiscriminate releases of lethal poisons into the environment. In 1971, the Supreme Court legitimized the citizen's role in policing administrative decisions affecting the environment, holding that a group of private citizens was entitled to judicial review of the United States Secretary of Transportation's authorization of a highway project that was to pass through a park.<sup>58</sup> In 1972, the Supreme Court, in *Sierra*

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tant chronicle of this century for the human race").

55. 362 U.S. 929, 929 (1960) (Douglas, J., dissenting).

56. *Id.* at 930-31 (Douglas, J., dissenting).

57. *See id.* (Douglas, J., dissenting).

58. *See Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402, 410-16 (1971). Possibly more significant than the preservation of the particular park for purposes of detecting Rachel Carson's environmental rights is the Court's reading of the "arbitrary and capricious" standard in the Administrative Procedure Act, 5

*Club v. Morton*,<sup>59</sup> stated that the Sierra Club had no standing to challenge government actions that allegedly threatened the natural integrity of Mineral King Valley, part of the Sierra Nevada Mountains.<sup>60</sup> The Court did, however, indicate that a member of the Sierra Club claiming a personal injury might assert before a court interests of the general public that supported the member's claim.<sup>61</sup> The Court also acknowledged that an injury to the aesthetic and ecological interests of a plaintiff was as legally cognizable as an economic injury.<sup>62</sup> In spite of Justice Douglas's dissent to the decision,<sup>63</sup> *Sierra Club* may nonetheless be characterized as an environmentally sensitive opinion that adheres to the teachings of Carson, who urges us to recognize the often inarticulable, often personal value of nature's beauty.<sup>64</sup>

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U.S.C. § 706(2)(A) (1988), as allowing the reviewing court to engage in "a thorough, probing, in-depth review" of agency decisionmaking. *Id.* at 413-15.

59. 405 U.S. 727 (1972).

60. *Id.* at 735-41.

61. *Id.* at 740 n.15.

62. *Id.* at 734.

63. *Id.* at 741. In his dissent, Justice Douglas advocated, perhaps more wistfully than adversarially, that the law fashion

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 preservation.

*Id.* at 741-42 (Douglas, J., dissenting) (referencing Christopher D. Stone, *Should Trees Have Standing?—Toward Legal Rights for Natural Objects*, 45 S. CAL. L. REV. 450 (1972)).

Justice Blackmun, in his own dissent, advocated that organizations like the Sierra Club, that "possessed . . . pertinent, bona fide, and well-recognized attributes and purposes in the area of environment" be permitted standing in environmental cases. *Id.* at 757 (Blackmun, J., dissenting).

64. In response to the Sierra Club's allegation that a proposed road through the Sequoia National Park "would destroy or otherwise adversely affect the scenery, natural and historic objects and wildlife of the park and would impair the enjoyment of the park for future generations," the Court wrote that "[a]esthetic and environmental well-being . . . are important ingredients of the quality of life in our society." *Id.* at 734. This passage may have been inspired by a passage from Carson's *Silent Spring*:

I know well a stretch of road where nature's own landscaping has provided a border of alder, viburnum, sweet fern, and juniper with sea-

Standing to assert the interests of the environment enjoyed a degree of success after the *Sierra Club* decision.<sup>65</sup> More significantly, Congress inserted into the major federal environmental statutes express grants of standing, enabling citizens to bring actions to enforce the statutes' directives.<sup>66</sup> In addition, CERCLA provides for public participation in the cleanup plan development process<sup>67</sup> and also for a private cause of action that in many ways parallels the government suit authorized

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sonally changing accents of bright flowers, or of fruits hanging in jeweled clusters in the fall. . . . But the [herbicide] sprayers took over and the miles along that road became something to be traversed quickly . . . . But here and there authority had somehow faltered and by an unaccountable oversight there were oases of beauty in the midst of austere and regimented control—oases that made the desecration of the greater part of the road the more unbearable. In such places my spirit lifted to the sight of the drifts of white clover or the clouds of purple vetch with here and there the flaming cup of a wood lily.

CARSON, *supra* note 22, at 71.

65. The Supreme Court made its most elastic use of the dicta in *Sierra Club* in *United States v. Students Challenging Regulatory Agency Procedures (SCRAP)*, 412 U.S. 669 (1973), in which the Court found that "an identifiable trifle [of a perceptible personal injury to the plaintiff] is enough for standing to fight out a question of principle; the trifle is the basis for standing and the principle supplies the motivation." *Id.* at 689 n.14 (quoting Kenneth C. Davis, *Standing: Taxpayers and Others*, 35 U. CHI. L. REV. 601, 613 (1968)).

66. See, e.g., Clean Water Act, 33 U.S.C. § 1365 (1988) (requiring a plaintiff to allege that he or she was "adversely affected" by the illegal discharge); Clean Air Act, 42 U.S.C. § 7604 (1988 & Supp. V 1993) (allowing a person to sue for enforcement of "an emission standard or limitation" or to "allege a violation of a specific strategy or commitment in the [State Implementation Plan]"); *Wilder v. Thomas*, 659 F. Supp. 1500 (S.D.N.Y. 1987), *aff'd*, 854 F.2d 605 (2d Cir. 1988); see also Solid Waste Disposal Act, 42 U.S.C. § 6972 (1988) (allowing any person to commence a civil action against any person alleged to be in violation of any permit, standard, regulation, condition, requirement, prohibition or order" issued under the Act, or against any person "who has contributed or who is contributing to the past or present handling, storage, treatment, transportation or disposal of any solid or hazardous waste which may present an imminent and substantial endangerment to the health of the environment"); Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), 42 U.S.C. § 11046(a)(1) (1988) (allowing a citizen to bring suit for a variety of disclosure violations).

Interestingly, NEPA does not provide a statutory basis for citizens to litigate government adherence to its environmental review process requirements. It does, however, acknowledge the contribution public and private organizations make toward "creat[ing] and maintain[ing] conditions under which man and nature can exist in productive harmony." 42 U.S.C. § 4331(a) (1988).

67. CERCLA, 42 U.S.C. §§ 9613(k)(2), 9617, 9622(d)(2) (1988).

under the statute.<sup>68</sup>

Finally, it is worth noting that traditional common-law causes of action, including nuisance, trespass, negligence, and strict liability for abnormally dangerous activities, are actions under which private citizens may assert personal rights to live unassaulted by the toxins of technology.<sup>69</sup> Although these causes of action generally do not promise the wholesale relief environmentalist plaintiffs desire, they do reflect Carson's ideal that individuals bear the right to combat pollution.<sup>70</sup>

Thus, we may discern progress in the last thirty years toward the Carson ideal that private citizens have legal rights to control their contact with toxins. Recently, however, signs of a severe judicial backlash against the right of an individual to assert ecological grievances may be discerned. In 1990, and again in 1992, Justice Scalia delivered Supreme Court opinions that grossly reduced citizens' power to establish standing in environmental cases.<sup>71</sup>

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68. *Id.* § 9607(a)(4)(B). Arguably, the private plaintiff faces a greater burden of proof than does the government plaintiff. *See, e.g., United States v. Northeastern Pharmaceutical & Chem. Co.*, 810 F.2d 726 (8th Cir. 1986), *cert. denied*, 484 U.S. 848 (1987).

69. Most federal environmental law statutes include savings provisions to avoid preempting these property-based environmental rights actions. *See, e.g., CWA*, 33 U.S.C. § 1365 (1988); *Solid Waste Disposal Act*, 42 U.S.C. § 6929 (1988); *CAA*, 42 U.S.C. § 7459 (1988).

70. The savings provisions, however, may be severely curtailed by the courts. *See, e.g., International Paper Co. v. Ouellette*, 479 U.S. 481 (1987).

71. In *Lujan v. National Wildlife Federation*, 497 U.S. 871 (1990), the Court held that the individual plaintiffs had not established that they were personally injured by government actions when the plaintiffs made recreational use of land in the vicinity of land the federal government opened to mining claims and oil and gas leases. *Id.* at 889. The Court concluded that individuals "cannot seek *wholesale* improvement of [treatment of the environment] by court decree, rather than in the offices of [an agency] or the halls of Congress, where programmatic improvements are normally made." *Id.* at 891. In his dissent, however, Justice Blackmun asserted that "a single plaintiff, so long as he is injured by [an agency rule of broad applicability], may obtain 'programmatic' relief that affects the rights of parties not before the court." *Id.* at 913 (Blackmun, J., dissenting).

In *Lujan v. Defenders of Wildlife*, 504 U.S. 555 (1992), again under the rubric of upholding the separation of legislative and judicial powers, the Court denied the plaintiffs standing to challenge a rule promulgated by the Secretary of the Interior interpreting the scope of his regulatory duties under the ESA. The plaintiffs claimed that the government action jeopardized species of crocodile, elephant, and leopard, identifying as their personal injuries imprecise plans to revisit foreign lands to ob-

Perhaps more significantly, the property rights arguments supported by Carson in *Murphy* have lashed back against those who would regulate private property in the name of environmental preservation. In *Lucas v. South Carolina Coastal Council*<sup>72</sup> and again in *Dolan v. City of Tigard*,<sup>73</sup> the Supreme Court found that regulatory actions designed to protect or promote a healthy environment that have the collateral effect of restricting the amount of profit a landowner is able to extract from his or her property constituted takings of property necessitating compensation.<sup>74</sup>

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serve the species. *Id.* at 562-63. The Court concluded that these harms were not imminent or precise enough to establish standing. *Id.* at 563-64. The implication that the grievances lacked urgency underscores the vulnerability of the standing game environmental plaintiffs must play. The true injury the plaintiffs hoped to address—preventing the potential extinction of the named species—did not lack urgency. The Court's refusal to incorporate this greater concern into its analysis of the standing question largely eviscerated the invitations in *Sierra Club v. Morton*, 405 U.S. 727, 740 n.15 (1972), and *United States v. Students Challenging Regulatory Agency Procedures (SCRAP)*, 412 U.S. 669, 689 n.14 (1973), for plaintiffs to bring questions of public concern to a court by establishing a related personal injury. There may still be hope, however, as indicated by the Ninth Circuit's holding in *Salmon River Concerned Citizens v. Robertson*, 32 F.3d 1346 (9th Cir. 1994) (finding standing in individual plaintiffs' asserting injury due to inadequacy of agency adherence to NEPA), indicating that issues of public concern may not be entirely outside the realm of personal standing.

72. 505 U.S. 1003 (1992).

73. 114 S. Ct. 2309 (1994).

74. In *Lucas*, the Court limited the regulatory authority of government to control private property use without compensation to regulatory controls based on "background principles" of property and nuisance law. *Lucas*, 505 U.S. at 1010. In short, the Court prioritized historical notions of private property interests over modern scientific understanding of the environmental impact of private property development. In *Dolan*, the Court scrutinized the manner of regulation, finding that hardship to the private property owner must bear a "rough proportionality" to the environmental impact of the landowner's proposed development. *Dolan*, 114 S. Ct. at 2319-20. For a reading of *Lucas* limiting its takings test to government regulation that renders a landowner's property valueless, see *Wilson v. Commonwealth*, 597 N.E.2d 43, 46 (Mass. 1992). In *Wilson*, the Massachusetts regulatory process prohibited the landowner from building a sea wall in time to prevent his shorefront house from succumbing to the sea. *Id.* at 44. The court found that it was the wave that had destroyed the value of Wilson's property, and not the regulation of his right to develop. *Id.* at 46.

3. *Carson's Ideal: A Right to Information About Government Action Affecting the Environment*

Essential to Carson's advocacy of a right to live unassailed by pollutants is her belief that individuals must be provided information about toxins in the environment in order to make knowledgeable decisions about whether to accept or combat government or commercial decisions and actions.<sup>75</sup> In *Silent Spring*, she relates numerous historical scenarios to establish how the use of chemicals to eradicate a perceived problem has often led to unanticipated results, such as the proliferation of the intended victims or some other unanticipated environmental tragedy that dwarfs the intended positive goal.<sup>76</sup> Carson does not trumpet her conclusions as to why humankind repeatedly engages in fools' missions against insect and plant pests miscast as monsters and how our misunderstanding and misuse of chemicals causes great and unintended harm to the earth, but she does identify a number of human misperceptions that account for such errors.

One human flaw Carson identifies is the attraction to short-term fixes, a propensity that encourages short-sighted and ill-informed decisionmaking.<sup>77</sup> In addition, she points out that when we do engage in study, we rely on private sector industries with profit goals to fund scientific research about the effects and effectiveness of chemical solutions to environmental problems.<sup>78</sup>

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75. CARSON, *supra* note 22, at 13 ("The obligation to endure gives us the right to know.") (quoting Jean Rostand).

76. *Id.* at 43-44 (relating the story of the Rocky Mountain Arsenal, where the production of insecticides led to widespread disease among livestock and crops miles from the plant, even though the form of contamination found in the environment had never been manufactured at the plant, but had been spawned spontaneously from a mix of discharged chemicals subject to air, water and sunlight).

77. *Id.* at 68-69. Carson identifies chemical weed killers as a bright new toy. . . . [T]hey give a giddy sense of power over nature to those who wield them, and as for the long-range and less obvious effects—these are easily brushed aside as the baseless imaginings of pessimists. The "agricultural engineers" speak blithely of "chemical plowing" in a world that is urging to beat its plowshares into spray guns. The town fathers of a thousand communities lend willing ears to the chemical salesman and the eager contractors who will rid the roadsides of "brush"—for a price. It is cheaper than mowing, is the cry.

*Id.*

78. *Id.* at 258-59.

Indeed, Carson even identifies situations in which we allow private industry to influence our perception of which natural phenomena constitute problems for us and warrant our interference.<sup>79</sup> Carson indicates that due to these and other influences, we have a high, emotionally fed propensity to underestimate the dangers presented by synthesized chemicals.<sup>80</sup> This, in turn, lulls us into misusing chemicals and allows us to apply chemicals without concern as to their detrimental effects.<sup>81</sup>

In one interview, Carson stated that her purpose in writing *Silent Spring* was to remedy the imbalance of information available to the public about the benefits and hazards of pesticides.<sup>82</sup> Indeed, a recurring theme of *Silent Spring* is that sup-

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The major chemical companies are pouring money into the universities to support research on insecticides. This creates attractive fellowships for graduate students and attractive staff positions. Biological-control studies, on the other hand, are never so endowed—for the simple reason that they do not promise anyone the fortunes that are to be made in the chemical industry. . . . This situation also explains the otherwise mystifying fact that certain outstanding entomologists are among the leading advocates of chemical control.

*Id.*

79. *Id.* at 176.

Gardening is now firmly linked with the super poisons. Every hardware store, garden-supply shop, and supermarket has rows of insecticides for every conceivable horticultural situation. Those who fail to make wide use of this array of lethal sprays and dusts are by implication remiss, for almost every newspaper's garden page and the majority of the gardening magazines take their use for granted.

*Id.*

80. *Id.* at 174.

If a huge skull and crossbones were suspended above the insecticide department the customer might at least enter it with the respect normally accorded death-dealing materials. But instead the display is homey and cheerful, and, with the pickles and olives across the aisle and the bath and laundry soaps adjoining, the rows upon rows of insecticides are displayed.

*Id.*

81. *Id.* ("Lulled by the soft sell and the hidden persuader, the average citizen is seldom aware of the deadly materials with which he is surrounding himself; indeed, he may not realize he is using them at all.")

82. See American Experience, *supra* note 40 (transcript No. 551, at 15).

We have heard the benefits of pesticides. We have heard a great deal about their safety, but very little about the hazards, very little about the failures, the inefficiencies. And yet, the public was being asked to accept these chemicals, was being asked to acquiesce in their use and did not

port for pesticide spraying, when not motivated by profit, is illogical, and can only be the product of ignorance about the ineffectiveness and detrimental side effects of spraying.<sup>83</sup> Carson explains that DDT is ineffective against its insect victims, which have displayed an uncanny biological ability to adapt to the poisons that humans apply toward their eradication.<sup>84</sup> *Silent Spring* also explains that DDT kills off the natural predators of its intended victims, resulting in a greater pest population with no natural controls.<sup>85</sup> Carson sets forth the toxic side

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have the whole picture, so I set about to remedy the balance there.

*Id.*

83. CARSON, *supra* note 22, at 13.

There is still very limited awareness of the nature of the threat. This is an era of specialists, each of whom sees his own problem and is unaware of or intolerant of the larger frame into which it fits. It is also an era dominated by industry, in which the right to make a dollar at whatever cost is seldom challenged. When the public protests, confronted with some obvious evidence of damaging results of pesticide applications, it is fed little tranquilizing pills of half truth. We urgently need an end to these false assurances, to the sugar coating of unpalatable facts.

*Id.*

84. *Id.* at 8.

The whole process of spraying seems caught up in an endless spiral. Since DDT was released for civilian use, a process of escalation has been going on in which ever more toxic material must be found. This has happened because insects, in a triumphant vindication of Darwin's principle of the survival of the fittest, have evolved super races immune to the particular insecticide used, hence a deadlier one has always to be developed—and then a deadlier one than that. It has happened also because . . . destructive insects often undergo a "flareback," or resurgence, after spraying, in numbers greater than before. Thus the chemical war is never won, and all life is caught in its violent crossfire.

*Id.*

85. *Id.* at 80.

Ragweed, the bane of hay fever sufferers, offers an interesting example of the way efforts to control nature sometimes boomerang. Many thousands of gallons of chemicals have been discharged along roadsides in the name of ragweed control. But the unfortunate truth is that blanket spraying is resulting in more ragweed, not less. Ragweed is an annual; its seedlings require open soil to become established each year. Our best protection against this plant is therefore the maintenance of dense shrubs, ferns, and other perennial vegetation. Spraying frequently destroys this protective vegetation and creates open, barren areas which the ragweed hastens to fill.

*Id.*; see *id.* at 112-113.

[S]cientific studies have established the critical role of birds in insect con-



effects of pesticide spraying, such as the ease with which a pesticide spreads through the food chain and its insolubility in the human body.<sup>86</sup> Finally, Carson provides nontoxic alternatives to wholesale chemical spraying that meet the goals of spraying, but visit none of the lethal effects.<sup>87</sup> In short, Carson proves to her reader the value of information in decisionmaking and makes us understand that we cannot assert or even recognize our right to a cleaner environment without knowledge about toxins.<sup>88</sup>

#### *4. The Law's Response to Carson's Ideal: The National Environmental Policy Act*

NEPA, discussed above in terms of transforming externalities into internal costs,<sup>89</sup> also serves as a direct translation into law of Carson's philosophy on the right to, and need for, public information.<sup>90</sup> NEPA requires that all government agents study the environmental effects of their activities as part of the process of

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trol . . . . But what happens in nature is not allowed to happen in the modern, chemical-drenched world, where spraying destroys not only the insects but their principle enemy, the birds. When later there is a resurgence of the insect population, as almost always happens, the birds are not there to keep their numbers in check.

*Id.* See generally *id.* at 245-75 (discussing the ability of nature to adapt to chemicals and resist their effects).

86. *Id.* at 22-23 ("One of the most sinister features of DDT and related chemicals is the way they are passed on from one organism to another through all the links of the food chains. . . . The poison may also be passed on from mother to offspring."). See generally *id.* at 187-243 (discussing the specific health risks associated with chemical pollution).

87. The irony of [the] all-out chemical assault on roadsides and utility rights-of-way is twofold. It is perpetuating the problem it seeks to correct, for as experience has clearly shown, the blanket application of herbicides does not permanently control roadside "brush" and the spraying has to be repeated year after year. And as a further irony, we persist in doing this despite the fact that a perfectly sound method of selective spraying is known, which can achieve long-term vegetational control and eliminate repeated spraying in most types of vegetation.

*Id.* at 74.

88. *Id.* at 13 ("It is the public that is being asked to assume the risks that the insect controllers calculate. The public must decide whether it wishes to continue on the present road, and it can do so only when in full possession of the facts.").

89. See *supra* notes 32-33 and accompanying text.

90. For another example of a disclosure statute, see the EPCRA, 42 U.S.C. §§ 11001-11050 (1988 & Supp. V 1993).

deciding whether and how to engage in those activities.<sup>91</sup> In addition to forcing informed decisionmaking on the part of government actors, NEPA also informs the public. NEPA requires government actors to record their studies of the environmental impacts of planned actions in reports that are available to the public.<sup>92</sup> Thus, NEPA's statutory language serves readily as evidence of Carson's philosophy translated into law.

Over the quarter century of its existence, NEPA has suffered severely from political and judicial backlash against environmentalism. The Supreme Court has firmly relegated NEPA's role to that of requiring agencies to consider environmental impacts and project alternatives, rejecting arguments that NEPA requires agencies to take the most environmentally benign course of action identified through the NEPA analysis process.<sup>93</sup> In *Lujan v. Defenders of Wildlife*,<sup>94</sup> the Supreme Court rejected the argument that a citizen-plaintiff may suffer a "procedural injury" when government actors violate a required procedure.<sup>95</sup> Although these trends do not combine to

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91. The key provision of NEPA requires federal agencies to:

include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on—(i) the environmental impact of the proposed action, (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented, (iii) alternatives to the proposed action, (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

NEPA, 42 U.S.C. § 4332(2)(C) (1988).

92. *Id.* ("Copies of [the environmental impact report prepared by a federal agency pertaining to a planned action] and the comments and views of the appropriate Federal, State, and local agencies, which are authorized to develop and enforce environmental standards, shall be made available to . . . the public . . .").

93. See *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 351 (1989) ("NEPA merely prohibits uninformed—rather than unwise—agency action."); *Strycker's Bay Neighborhood Council, Inc. v. Karlen*, 444 U.S. 223, 227-28 (1980) (holding that the Department of Housing and Urban Development adequately considered the environmental consequences of its decision); see also *Carolina Env'tl. Study Group v. United States*, 510 F.2d 796 (D.C. Cir. 1975) (approving an Environmental Impact Statement that did not give weighty consideration to a potential environmental impact determined to be remote but devastating).

94. 504 U.S. 555 (1992).

95. *Id.* at 571-78. The Court argued that the citizen suit provision of the ESA, 16

negate a citizen's right to sue to enforce NEPA,<sup>96</sup> they demonstrate that a citizen's right to environmental impact information is shrinking.

At the present time, however, NEPA does serve environmentalists well in its function of informing. Moreover, by providing a legal basis for questioning federal agencies' adherence to the statute, NEPA allows environmentalists to negotiate with and influence federal agencies. Indeed, Rachel Carson might have favored the use of NEPA in a 1987 Oregon case that was strongly reminiscent of *Murphy v. Butler*.<sup>97</sup> In the case, challengers to a state program for the eradication of gypsy moths by aerial pesticide spraying utilized NEPA to force a five-year environmental impact study prior to the program's commencement.<sup>98</sup> One can only guess whether Carson would have been heartened by the legal leverage provided by NEPA, which was unavailable in *Murphy*, or disappointed at the government's persistence in attempting to eradicate insects.<sup>99</sup>

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U.S.C. § 1540(g) (1988), does not create a procedural right for any person to sue a federal agency and, more generally, that "an individual [can enforce procedural rights] so long as the procedures in question are designed to protect some threatened concrete interest of his that is the ultimate basis of his standing." *Defenders of Wildlife*, 504 U.S. at 572, 573 n.8.

96. See *Salmon River Concerned Citizens v. Robertson*, 32 F.3d 1346, 1354 (9th Cir. 1994) (explaining that *Defenders of Wildlife* does not preclude a plaintiff from alleging a procedural injury when the agency procedure would protect a direct and personal interest of that plaintiff).

97. 362 U.S. 929 (1960).

98. *Oregon Envtl. Council v. Kunzman*, 817 F.2d 484, 489-90 (9th Cir. 1987).

99. In *Kunzman*, the plaintiffs challenged an EIS discussing Oregon's plan to undertake aerial spraying of chemical insecticides to eradicate gypsy moths. *Id.* at 489. Litigation commenced in 1982 and proceeded through four phases, each inspiring additions and alterations to the EIS. *Id.* at 489-90. The court first discussed the requirement set forth in the NEPA regulations that an EIS be written in plain language so that the public may readily understand it, *id.* at 492-94, then discussed the requirement that an EIS contain a "worst case" analysis in its discussion of potential environmental impacts of the planned action, *id.* at 494-95, and finally briefly reviewed the potential cumulative effect the planned action would have on the environment, *id.* at 496.

*B. The Responsibility To Maintain Multiple and Well-Dispersed Species*

*[I]n nature nothing exists alone.*<sup>100</sup>

*[E]ach living thing is bound to its world by many threads, weaving the intricate design of the fabric of life.*<sup>101</sup>

*1. Carson's Ideal: The Web of Life*

*Silent Spring* does not paint human technological advancement as patently evil.<sup>102</sup> Indeed, nowhere in Carson's writing does she advocate the eradication of human comforts as an adversarial response to the chemical industry's program to eradicate pests.<sup>103</sup> Instead, Carson promotes self-control in human behavior and respect for the environment in the form of attention to maintaining a variety of widely dispersed species as the core of ecologically safe behavior.<sup>104</sup> In Carson's view, the more

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100. CARSON, *supra* note 22, at 51.

101. RACHEL CARSON, *THE EDGE OF THE SEA* 14 (1955).

102. Carson uses some uncompromising terms when discussing certain human endeavors. She states that "radiation is now the unnatural creation of man's tampering with the atom. [In addition, t]he chemicals to which life is asked to make its adjustment . . . are the synthetic creations of man's inventive mind, brewed in his laboratories, and having no counterparts in nature." CARSON, *supra* note 22, at 7. Carson paid painstaking attention to her word choice, and there is little doubt that the negative imagery was intentional.

103. *Id.* at 9 ("All this is not to say there is no insect problem and no need of control. I am saying, rather, that control must be geared to realities, not to mythical situations, and that the methods employed must be such that they do not destroy us along with the insects.").

104. *Id.* at 10.

Nature has introduced great variety into the landscape, but man has displayed a passion for simplifying it. Thus he undoes the built-in checks and balances by which nature holds the species within bounds . . . . A generation or more ago, the towns of large areas of the United States lined their streets with the noble elm tree. Now the beauty they hopefully created is threatened with complete destruction as disease sweeps through the elms, carried by a beetle that would have only limited chance to build up large populations and to spread from tree to tree if the elms were only occasional trees in a richly diversified planting.

*Id.*; see also *id.* at 117 ("The key to a healthy plant or animal community lies in what the British ecologist Charles Elton calls 'the conservation of variety.'").

we address the goal of ecological diversity in our decisionmaking, the more responsibly we live.<sup>105</sup>

Indeed, ecological diversity may serve as the cornerstone of Carson's scientific solution to the inevitable environmental degradation that humans cause.<sup>106</sup> Carson's call for humans to focus on the importance of species diversity offers an ultimate goal and benchmark for self-control against alarming increases in the level and toxicity of pollution resulting from technological development and population growth.<sup>107</sup>

## 2. *The Law's Response to Carson's Ideal: Species and Habitat Protection*

Carson's philosophic ideal of focusing on ecological diversity as the crucial benchmark in determining how and when to control human activities has been reflected in environmental law in the decades since her death in 1964, in both obvious and subtle ways. For example, NEPA's requirement that an environmental impact statement (EIS) address the cumulative impact on the environment of a proposed agency action is a clear example of the law reflecting Carson's emphasis on the importance of maintaining a balance in nature.<sup>108</sup> The cumulative impact analysis

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105. The view that humans must work to maintain species diversity contrasts directly with the view that humans may conquer or control nature or eradicate even an inconvenient element of nature.

We need a more high-minded orientation and a deeper insight . . . . Life is a miracle beyond our comprehension . . . . The resort to weapons such as insecticides to control it is a proof of insufficient knowledge and of an incapacity so to guide the processes of nature that brute force becomes unnecessary. Humbleness is in order; there is no excuse for scientific conceit here.

*Id.* at 275 (quoting C.J. Briejer, *The Growing Resistance of Insects to Insecticides*, 13 ATL. NATURALIST 149-55 (1958)).

106. CARSON, *supra* note 22, at 64 ("The earth's vegetation is part of a web of life in which there are intimate and essential relations between plants and the earth, between plants and other plants, between plants and animals.").

107. *Id.* at 7.

The rapidity of change and the speed with which new situations are created follow the impetuous and heedless pace of man rather than the deliberate pace of nature . . . . To adjust to [man's chemical creations] would require time on the scale that is nature's; it would require not merely the years of a man's life but the life of generations.

*Id.*

108. 40 C.F.R. § 1508.25(a)(2) (1994) (requiring agencies to consider "[c]umulative

requires the preparer of an EIS to address the environmental impact of a proposed action in the context of existing and other proposed activities already impacting the environment in the vicinity of the proposed action.<sup>109</sup>

Wetland protection is another example of the law's attempt to espouse the Carson ideal of maintaining a diverse and balanced ecosystem. Wetlands are ecologically valuable as wildlife habitats, flood control areas, and natural filters of polluted rain and groundwaters.<sup>110</sup> Addressed (although not by name) in the Clean Water Act (CWA), wetlands are protected by a permit system designed to minimize their destruction while allowing some development in and around wetland areas.<sup>111</sup>

In spite of continued, if not increasing, appreciation of the ecological importance of wetlands, as well as a growing body of experience documenting a discouraging failure rate in attempts to replicate wetlands,<sup>112</sup> the present administration's policy is to follow the conservatives' concept of "no net loss," which is a program designed to ease the general statutory prohibition against wetland destruction with promises to create wetlands where they will visit less inconvenience on development plans.<sup>113</sup> In addition, because wetland protection regulations often exact the cost of a broadly enjoyed public benefit from relatively few development-hungry landowners, flat development prohibitions invite takings challenges, thus further encouraging exploration of compromisory options.<sup>114</sup> Legal protection of

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actions, which when viewed with other proposed actions have cumulatively significant impacts").

109. See, e.g., *Baltimore Gas & Elec. Co. v. Natural Resources Defense Council, Inc.*, 462 U.S. 87, 106-07 (1983).

110. Virginia C. Veltman, Comment, *Banking on the Future of Wetlands Using Federal Law*, 89 NW. U. L. REV. 654, 654-55 (1995).

111. See CWA, 33 U.S.C. § 1344 (1988 & Supp. V 1993); 33 C.F.R. pt. 320 (1994); 40 C.F.R. pts. 230, 231 (1994).

112. Veltman, *supra* note 110, at 665-70 (citing WETLAND CREATION AND RESTORATION: THE STATUS OF THE SCIENCE (John A. Kisler & Mary E. Kentula eds., 1990)).

113. See David Johnston, *White House Asks Revision of Rules to Save Wetlands*, N.Y. TIMES, Aug. 25, 1993, at A1; Linda Kanamine, *Wetlands Policy Appeases, Doesn't Please*, USA TODAY, Aug. 25, 1993, at 6A; see also Veltman, *supra* note 110, at 657 (describing the "no net loss" policy).

114. Compare *United States v. Riverside Bayview Homes, Inc.*, 474 U.S. 121 (1985) (upholding an Army Corps of Engineers definition of wetlands challenged as

wetlands, like species protection, thus suffers from the usual arsenal of political and legal challenges, evidencing a backlash at times when economic or other considerations spark a resurgence of the view of humans as the great global eradicators.

The ESA,<sup>115</sup> as originally promulgated, also elevates the philosophical teaching of Carson over more traditional legal goals. An early version of the Act contained an absolute ban on federal government actions that detrimentally impacted endangered species or their habitats.<sup>116</sup> In a judicial opinion that Carson might have penned, the Supreme Court upheld the statutory requirement that federal agencies must “insure that [their] actions . . . do not *jeopardize* the continued existence’ of an endangered species or ‘*result in the destruction or modification of habitat of such species.*”<sup>117</sup> The Court read the statute to reveal “[t]he plain intent of Congress . . . to halt and reverse the trend toward species extinction, whatever the cost.”<sup>118</sup>

The ESA is, unfortunately, as fine an example of environmental backlash as it is an example of the law embracing Carson’s view of the importance of maintaining a biodiverse environment. The ESA reputation for prioritizing wildlife over human economic costs has resulted in widespread public animosity toward it.<sup>119</sup> Due to the backlash following the decision in *Tennessee*

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overbroad and limiting the takings question to a review of the propriety of agency action denying a permit to develop in a wetland) *with Florida Rock Indus., Inc. v. United States*, 791 F.2d 893 (Fed. Cir. 1986) (holding that lower court must consider whether government’s prohibition on mining diminished market value of land to determine whether government regulation constituted a taking), *cert. denied*, 479 U.S. 1053 (1987).

115. 16 U.S.C. §§ 1531-1544 (1988 & Supp. V 1993).

116. *See Tennessee Valley Auth. v. Hill*, 437 U.S. 153, 160 (1978) (“All . . . Federal departments and agencies shall . . . [take] *such action necessary to insure that actions authorized, funded, or carried out by them do not jeopardize the continued existence of such endangered species and threatened species or result in the destruction or modification of habitat of such species.*”) (quoting 16 U.S.C. § 1536 (1976)).

117. *Id.* at 173 (quoting 16 U.S.C. § 1536 (1976)).

118. *Id.* at 184.

119. *See* Oliver A. Houck, *The Endangered Species Act and Its Implementation by the U.S. Departments of Interior and Commerce*, 64 U. COLO. L. REV. 277, 278 (1993) (quoting Michael Wines, *Bush, in Far West, Sides with Loggers*, N.Y. TIMES, Sept. 15, 1992, at A25 (quoting President Bush as saying: “The Endangered Species Act was intended as a shield for species against the effects of major construction projects like highways and dams, not a sword aimed at the jobs, families and com-

*Valley Authority v. Hill*,<sup>120</sup> Congress and the implementing agencies have whittled the ESA down to far less than an invincible monument to human dedication to bio- and habitat-diversity.<sup>121</sup>

Possibly the clearest symbolic statement of the backlash against legal respect for the web of life brings us once again to *Lujan v. Defenders of Wildlife*.<sup>122</sup> In a case questioning whether the ESA applies to American actions overseas, the Supreme Court dismissed several closely related theories of standing premised on the view that all persons live in a "contiguous ecosystem" in which injury to a species overseas harms persons in the United States having an interest in those species.<sup>123</sup> The Court agreed that a person who worked with a particular animal threatened by a federal decision faced perceptible harm, but discarded the idea that a person is harmed by a threat to a species in another part of the world as "pure speculation and fantasy."<sup>124</sup> "[P]ure speculation and fantasy" is thus the Court's frank view of Carson's web of life.

### C. *The Moral Instinct To Preserve*

#### *Incidents [of painful deaths among birds and animals due to*

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munities of entire regions like the Northwest . . . It's time to put people ahead of owls.")).

120. 437 U.S. 153 (1960).

121. Compare the excerpt from an earlier version of the ESA, *supra* note 116, with the following version of the Act:

Each Federal agency shall . . . insure that any action authorized, funded, or carried out by such agency . . . *is not likely to jeopardize* the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species . . . *unless such agency has been granted an exemption for such action by the [Endangered Species] Committee.*

ESA, 16 U.S.C. § 1536(a)(2) (1988) (emphasis added); *see also* Portland Audubon Soc'y v. Endangered Species Comm., 984 F.2d 1534 (9th Cir. 1993) (ordering a hearing to determine whether the Bush Administration illegally lobbied the Endangered Species Committee to allow logging on federal land in Oregon); Houck, *supra* note 119, at 282-85 (noting the relatively small number of animals added to the list each year).

122. 504 U.S. 555 (1992).

123. *Id.* at 565.

124. *Id.* at 566.



pesticides] raise a question that is not only scientific but moral. The question is whether any civilization can wage relentless war on life . . . without losing the right to be called civilized . . . . By acquiescing in [acts] that can cause such suffering to a living creature, who among us is not diminished as a human being?<sup>125</sup>

Perhaps the most abstract aspect of Carson's philosophy, and also the message of her writing that renders her works inspirational as well as accessible to several generations of readers,<sup>126</sup> is her faith that humans possess a deep-seated instinct to protect and preserve nature and the earth, both for nature's sake and for future generations of humans, in spite of our simplistic infatuation with dominating and destroying nature.<sup>127</sup> Carson expresses this fundamental aspect of her philosophy in terms that readers may conclude have a moral, religious,<sup>128</sup> or anthropological tone.<sup>129</sup> Whatever one's view, Carson's endur-

125. CARSON, *supra* note 22, at 99-100.

126. See Ann H. Zwinger, *Introduction* to RACHEL CARSON, *THE SEA AROUND US* xxvi (1989) ("[S]o skillful a writer was Carson that, despite the book's loaded message, it became an immediate best-seller, urging a huge public to wake up to its responsibilities toward the natural world.").

[Rachel Carson] is the pure nature writer, the clear-eyed describer who leads us not only to new perceptions of the sea itself, but to the deeper understandings of how it all fits together . . . .

Sitting there alone on the beach reading I was moved to joy and despair. I stopped reading with a sense of sadness for the dramatic transition that came in her lifetime, which she helped bring about, from the Age of Innocence to the Age of Awareness. . . . Through sharing Carson's research, we become acutely sensitive to the interdependence of life.

*Id.* at xx-xxi.

127. CARSON, *supra* note 22, at 297 ("The 'control of nature' is a phrase conceived in arrogance, born of the Neanderthal age of biology and philosophy, when it was supposed that nature exists for the convenience of man.").

128. BROOKS, *supra* note 1, at 9 ("[H]er attitude toward the natural world was that of a deeply religious person.").

129. For a modern discussion of morality and the environment, see Theodore Roszak, *The Greening of Psychology*, 67 *UTNE READER* 51 (1995):

We see ecopsychology as an effort to strengthen our sympathetic bond with the natural world. One name for that bond—a new one—is "the ecological unconscious." But there are other, older names. In ancient days, it was called the *anima mundi*; many tribal people speak of it as their connection with Mother Earth and Father Sun and all our winged, finned, and four-legged relatives. Ecopsychology, far from being something

ing faith in a basic human instinct to coexist, hampered primarily by human ignorance,<sup>130</sup> is peculiarly nonlegal in nature.

*1. Carson's Ideal: Humans Must Accept and Defer to the Ecological Law of Interrelatedness*

Readers of any of Carson's works find examples of a primary tenet of ecology underlying the need to maintain ecological diversity—environmental interrelatedness. From her almost mystical observations of the “interchangeability of land and sea in this marginal world of the shore”<sup>131</sup> to her scientific explanation of the subterranean migration of toxins emanating from the Rocky Mountain Arsenal,<sup>132</sup> Carson makes us acutely aware of the “delicately adjusted, interlocking relationships” that link all forms of life.<sup>133</sup> From Carson's perspective, responding to environmental degradation is a positive duty more akin to a fiduciary stewardship than a punishment.<sup>134</sup>

Carson is willing to cast blame, however, and does not elevate herself above such plebeian concepts as fault.<sup>135</sup> In *The Sea*

new under the sun, belongs to the original form of environmentalism and the oldest tradition of psychological healing we know.

*Id.*

130. CARSON, *supra* note 126, at 95 (“Most of man's habitual tampering with nature's balance . . . has been done in ignorance of the fatal chain of events that would follow.”).

131. CARSON, *supra* note 101, at 6. Later in the same chapter, Carson observes that “[n]owhere on the shore is the relation of a creature to its surroundings a matter of a single cause and effect; each living thing is bound to its world by many threads, weaving the intricate design of the fabric of life.” *Id.* at 14.

132. CARSON, *supra* note 22, at 43.

133. CARSON, *supra* note 126, at 33. Carson focuses on the interrelationships that exist among the lives in the sea:

[T]hrough a series of delicately adjusted, interlocking relationships, the life of all parts of the sea is linked. What happens to a diatom in the upper, sunlit strata of the sea may well determine what happens to a cod lying on a ledge of some rocky canyon a hundred fathoms below, or to a bed of multicolored, gorgeously plumed seaworms carpeting an underlying shoal, or to a prawn creeping over the soft oozes of the sea floor in the blackness of mile-deep water.

*Id.*

134. See Rachel Carson, *Preface to the 1961 Edition* of CARSON, *supra* note 126, at xi (“[M]an's record as a steward of the natural resources of the earth has been a discouraging one.”).

135. BROOKS, *supra* note 1, at 9 (“[S]he would probably have recoiled at the term

*Around Us*, she portrays human tampering with nature in sharp, sometimes unforgiving terms.<sup>136</sup> In *Silent Spring*, she identifies the chemical industry as instrumental in developing chemical solutions to environmental problems, in obscuring potential long-term and external harms, and in denying causal connections between chemical products and tragic environmental conditions.<sup>137</sup> In addition, Carson identifies as guilty the consumer, whether farmer or urban homeowner, who is eager for the quick cure for labor or nuisances and unconcerned about the scientific realities associated with chemicals.<sup>138</sup>

Ultimately, the reader of *Silent Spring* understands that all persons share responsibility for the human, biological, and ecological suffering allowed in a culture that overvalues comfort and readily, if not proudly, accepts the fact that humans may cause a long-term imbalance in nature.<sup>139</sup> Carson asks whether

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'nun of nature' that has sometimes been applied to her.').

136. CARSON, *supra* note 126, at 93-95.

[M]an, unhappily, has written one of his blackest records as a destroyer on the oceanic islands. He has seldom set foot on an island that he has not brought about disastrous changes. . . . Upon species after species of island life, the black night of extinction has fallen. . . .

When man came in and rudely disturbed this balance, he set off a whole series of chain reactions. . . .

*Id.*

137. CARSON, *supra* note 22, at 64.

Sometimes we have no choice but to disturb these relationships [between living things and the earth], but we should do so thoughtfully, with full awareness that what we do may have consequences remote in time and place. But no such humility marks the booming "weed killer" business of the present day, in which soaring sales and expanding uses mark the production of plant-killing chemicals.

*Id.*

138. See *supra* note 76 and accompanying text.

139. CARSON, *supra* note 22, at 246.

In some quarters nowadays it is fashionable to dismiss the balance of nature as a state of affairs that prevailed in an earlier, simpler world—a state that has now been so thoroughly upset that we might as well forget it. . . . The balance of nature is not the same today as in Pleistocene times, but it is still there: a complex, precise, and highly integrated system of relationships between living things which cannot safely be ignored any more than the law of gravity can be defied with impunity by a man perched on the edge of a cliff. The balance of nature is not a *status quo*; it is fluid, ever shifting, in a constant state

any of us is untainted by the suffering of dying birds and squirrels exposed to DDT.<sup>140</sup> She convinces us that the blame for such widespread slaughter lies somewhere deeper than with a chemical industry that simply utilized a laissez-faire economic and political system in which the balance of nature plays no part.

As a scientist and nature lover, Carson laments all narrowly focused actions that ignore their environmentally destructive fallout, whether the decisionmakers acted out of greed, a prioritizing of values that undervalued the environment, or ignorance. As a scientist, she does not focus her primary attention on differentiating between degrees of intent, but chastises chemical companies for sacrificing life for dollars and customers for their ignorance about the effects of pesticides they apply to their crops in eager anticipation of the quick fix that such pesticides supply. In short, Rachel Carson's model for considering actions that visit destruction on the environment is that actors should be responsible for the harmful effects of their actions regardless of knowledge or intent. As is suitable for a scientist, she does not excuse actors for acting in ignorance.

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of adjustment.

*Id.*

140. *Id.* at 99-100.

These creatures are innocent of any harm to man. Indeed, by their very existence they and their fellows make his life more pleasant. Yet he rewards them with a death that is not only sudden but horrible. Scientific observers at Sheldon described the symptoms of a meadowlark found near death: "Although it lacked muscular coordination and could not fly or stand, it continued to beat its wings and clutch with its toes while lying on its side. Its beak was held open and breathing was labored." Even more pitiful was the mute testimony of the dead ground squirrels, which "exhibited a characteristic attitude in death. The back was bowed, and the forelegs with the toes of the feet tightly clenched were drawn close to the thorax . . . . The head and neck were outstretched and the mouth often contained dirt, suggesting that the dying animal had been biting at the ground.

*Id.* (quoting Thomas A. Scott et al., *Some Effects of a Field Application of Dieldrin on Wildlife*, 23 J. WILDLIFE MGMT. 409-27 (1959)).

## 2. *The Law's Response to Carson's Ideal: Superfund Liability*

Harnessing Carson's philosophy of human responsibility for maintaining ecological diversity into a statutory yoke was a task legislators could accomplish only by transcending a number of customary features of law.<sup>141</sup> In a world where human technological genius coupled with human ecological ignorance constantly threatens to extinguish whole species and habitats despite our alleged instinct to preserve, the primacy in law of mental state as the major determinant of degrees of liability must logically defer to the ability to control as the primary determinant of legal responsibility for an imbalance in nature.<sup>142</sup>

Likewise, Carson's goal of species and habitat diversity urges forfeiture of the traditional legal attention to causation in the environmental arena. The image of the seamless ecological web does not juxtapose neatly with that of the legal causation chain, its links representing well-defined degrees of proximity and its length directly proportionate to its vulnerability to defenses cast in terms of superceding and intervening events.<sup>143</sup> Legal causa-

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141. A number of CERCLA sections indicate a congressional intent to avoid adversity wherever possible in order to effect prompt cleanups. See, e.g., CERCLA, 42 U.S.C. § 9613(h) (1988) (postponing judicial review of challenges to cleanup orders until after the cleanup in most cases).

142. See *United States v. Akzo Coatings of Am., Inc.*, 949 F.2d 1409, 1418 (6th Cir. 1991).

"First, Congress intended that the federal government be immediately given the tools necessary for a prompt and effective response to problems of national magnitude resulting from hazardous waste disposal. Second, Congress intended that those responsible for problems caused by the disposal of chemical poisons bear the costs and responsibility for remedying the harmful conditions they created."

*Id.* (quoting *United States v. Reilly Tar & Chem. Corp.*, 546 F. Supp. 1100, 1122 (D. Minn. 1982)) (emphasis added).

143. See W. PAGE KEETON ET AL., *PROSSER AND KEETON ON THE LAW OF TORTS* § 41, at 265 (5th ed. 1984).

"Proximate cause" . . . is merely the limitation which the courts have placed upon the actor's responsibility for the consequences of [his] conduct . . . . As a practical matter, legal responsibility must be limited to those causes which are so closely connected with the result and of such significance that the law is justified in imposing liability. Some boundary must be set to liability for the consequences of any act, upon the basis of some social idea of justice or policy.

*Id.*; see also *id.* § 44 (discussing intervening causes).

tion is premised on a sterile environment where the effects of actions are not tainted by distracting principles like the interconnectedness of all earthly things. Carson's perspective is far better reflected by a legal construct that forfeits causation in favor of meeting the obligation of maintaining a balanced nature.<sup>144</sup> Possibly the clearest example of an environmental statute that captures Carson's perspective on mental culpability and causation is CERCLA.

CERCLA bases liability on a party's relationship with a Superfund site, and only secondarily addresses the mental state of liable parties.<sup>145</sup> The statute incorporates a liability scheme that requires no specified proof that a defendant's acts or practices were responsible for the incurrence of cleanup costs.<sup>146</sup> Liability is status-based, imposed upon persons and entities that fall within one or more of four definitions of liable parties.<sup>147</sup> Certainly, in many cases, persons and entities that fit the responsible party definition in CERCLA also bear a direct causal relationship to cleanup costs, thereby conforming to traditional notions of legal causality.<sup>148</sup> CERCLA's language, however, al-

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144. Indeed, Carson teaches that humankind's genetic heritage is more valuable than the individual. CARSON, *supra* note 22, at 208.

145. Under CERCLA, 42 U.S.C. § 9607 (1988), civil liability is status-based. However, liability limits do not apply when events of pollution were the result of willful misconduct or willful negligence or where the primary cause of an event of pollution was a knowing violation of a standard or regulation. *Id.* § 9607(c). In addition, punitive damages may be imposed for noncooperation in a cleanup plan. *Id.*

146. *Id.* § 9607(a) (designating as liable parties who are associated with a site "from which there is a release [of a hazardous substance], or a threatened release which causes the incurrence of response costs"). Thus, the causation exists between the contamination and the cleanup costs, and not between the defendants' actions and the harm to the environment. See, e.g., *New York v. Shore Realty Corp.*, 759 F.2d 1032 (2d Cir. 1985) (holding that a site owner, liable under the statutory definition of liable party at § 107(a), could not avoid liability by showing that it neither owned the site at the time of disposal nor caused the contamination at the site).

147. Those liable include: (1) owners and operators of the contaminated site; (2) past owners and operators who owned or operated the contaminated site at the time hazardous substances were disposed of at the site; (3) persons who arranged for the disposal of hazardous substances at the contaminated site; and (4) persons who accepted hazardous substances for transportation to the contaminated site. 42 U.S.C. § 9607(a).

148. For example, a party that disposed of a particularly high volume of hazardous substances at a contaminated site, or one that disposed of particularly toxic waste, such that that party's individual contribution to the site necessitates government

lowers interpretations of its causation element that stretch liability even beyond what strict liability generally allows.<sup>149</sup> The fact that state of mind is secondary in CERCLA may be its strongest and most intimidating feature because it subordinates the basic legal tenet of culpability to CERCLA's primary purpose—environmental cleanup.<sup>150</sup>

Few examples are necessary to establish how courts have prioritized the government's need to detoxify over the usual checks and balances of the legal system. In the landmark case of *United States v. Wade*,<sup>151</sup> for example, the court adhered sternly to the language of CERCLA, finding that a particular party's waste need not be at a site for the party to be held liable, as long as some amount of waste of the type sent by the defendant is present at the site.<sup>152</sup> In *Dedham Water Co. v. Cumberland*

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action against the spread of contamination, might be deemed to have actually caused the incurrence of cleanup costs in the traditional sense. A party that contributed a minimal amount of hazardous waste to a site that by itself would necessitate no cleanup has caused the incurrence of cleanup costs only in the attenuated sense that "[t]he fatal trespass done by Eve was cause of all our woe." W. PAGE KEETON ET AL., PROSSER AND KEETON ON TORTS § 41, at 236 (4th ed. 1971).

149. See, e.g., *United States v. Wade*, 577 F. Supp. 1326, 1340 (E.D. Pa. 1983) (observing that it would be "absurd" to treat the disposal of a single copper penny as a disposal of hazardous substance, but admitting that the structure of CERCLA allows for it). A particularly interesting feature of CERCLA's strict liability scheme is that the statute does not expressly define the standard of liability as strict.

150. See THE LAW OF HAZARDOUS WASTE: MANAGEMENT, CLEANUP, LIABILITY AND LITIGATION § 14.01[1], at 14-15 (Susan M. Cooke ed., 1993) ("Fairness to [defendants] was not a major priority of Congress in enacting CERCLA . . . nor of the courts in construing the statute.") (citing *O'Neill v. Picillo*, 883 F.2d 176 (1st Cir. 1989), cert. denied, 493 U.S. 1071 (1990)) [hereinafter HAZARDOUS WASTE].

151. 577 F. Supp. 1326, 1331-32 (E.D. Pa. 1983). *Wade* was the first opinion to discuss the question of CERCLA causation in detail. See HAZARDOUS WASTE, *supra* note 150, § 14.01[4][d], at 14-133.

152. *Wade*, 577 F. Supp. at 1333; see also *Ascon Properties, Inc. v. Mobil Oil Co.*, 866 F.2d 1149, 1152-53 (9th Cir. 1989) (indicating that the simple fact of a release invokes liability against all persons falling within the listed parties under CERCLA); *United States v. Monsanto*, 858 F.2d 160, 170 (4th Cir. 1988) (indicating that the elimination of the need for CERCLA plaintiffs to bear a heavy causation burden was due to congressional awareness of the "synergistic and migratory capacities" of toxins and the "technological infeasibility" of tracing the source of released toxins), cert. denied, 490 U.S. 1106 (1989); *City of New York v. Exxon Corp.*, 766 F. Supp. 177, 195-96 (S.D.N.Y. 1991) (holding that contribution of below-ambient concentrations of a hazardous substance to a hazardous waste site may still trigger liability).

*Farms Dairy, Inc.*,<sup>153</sup> the First Circuit may have extended CERCLA liability further than any other court to date. The court indicated that a "threatened release[]" that a plaintiff might reasonably think could contaminate public wells may cause the incurrence of response costs for which the defendant may be held liable, even without any contamination migrating from the defendant's plant to the plaintiff's wells.<sup>154</sup>

The lack of any need to establish that a CERCLA defendant has committed a "bad act" may be best exemplified by CERCLA's imposition of retroactive liability. In *Arizona v. Motorola, Inc.*,<sup>155</sup> a district court held that the defendant had transported a hazardous substance, as defined under CERCLA, and incurred liability, even though the waste materials were deposited in a landfill in accordance with all applicable laws and regulations in existence at the time of the deposit.<sup>156</sup> The case is not unique in its analysis of CERCLA's infamous retroactive applicability.<sup>157</sup>

Congress and the courts have scrutinized CERCLA's liability scheme, particularly in connection with charges against its fairness.<sup>158</sup> One proposal—the elimination of joint and several liability in favor of liability apportioned among defendants in proportion to cleanup costs caused by their contributions—would se-

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153. 889 F.2d 1146 (1st Cir. 1989).

154. *Id.* at 1154. On remand, however, the district court held that Dedham Water could not recover cleanup costs from Cumberland Farms, finding that causation proof is required in a two-site private party CERCLA action. *See Dedham Water Co. v. Cumberland Farms Dairy, Inc.*, 770 F. Supp. 41, 43 (D. Mass. 1991), *aff'd* 972 F.2d 453 (1st Cir. 1992); *see also Artesian Water Co. v. New Castle County*, 659 F. Supp. 1269, 1287 (D. Del. 1987) (holding that proof of migration of defendant's waste to plaintiff's site is required in a two-site private CERCLA action), *aff'd*, 851 F.2d 643 (3d Cir. 1988).

155. 774 F. Supp. 566 (D. Ariz. 1991).

156. *Id.* at 573-75.

157. *See United States v. Northeastern Pharmaceutical and Chem. Co. (NEPACCO)*, 810 F.2d 726, 737 (8th Cir. 1986) (reversing the lower court holding that CERCLA contains no liability limitation for cleanup costs incurred due to pre-enactment actions of the defendant), *cert. denied*, 484 U.S. 848 (1987); *see also United States v. Kramer*, 757 F. Supp. 397, 429-32 (D.N.J. 1991) (upholding retroactive liability); *United States v. Shell Oil Co.*, 605 F. Supp. 1064 (D. Colo. 1985) (supporting the Eighth Circuit's decision in *NEPACCO*).

158. *See supra* note 12 and accompanying text; *see also United States v. DiBiase*, 45 F.3d 541, 544 (1st Cir. 1995) (finding the government's consent decree fair).



verely alter the plaintiff's burden under CERCLA.<sup>159</sup> In short, including a heightened causation element in CERCLA would replace the potentially overwhelming unfairness of joint and several liability with a potentially impossible task of establishing causation among countless contributors to a complex environmental condition.<sup>160</sup>

In addition to these political rumblings, recent cases indicate a judicial backlash against CERCLA's causation element as well.<sup>161</sup> In a recent case, *Dana Corp. v. American Standard, Inc.*,<sup>162</sup> Judge Robert L. Miller articulated a new evidentiary standard to support an inference that a particular defendant disposed of a hazardous substance at a site. According to Judge Miller, if the plaintiff in a CERCLA action cannot demonstrate that a defendant produced "a continuous and predictable waste stream . . . [then] the plaintiff must present some further evidence to justify a reasonable factfinder in inferring that the defendant contributed to the hazardous waste at the site."<sup>163</sup>

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159. Presently, defendants who prove that cleanup costs are allocable may limit their liability to the cleanup costs apportioned to their contribution to the site. See *In re Bell Petroleum Servs., Inc.*, 3 F.3d 889, 894-902 (5th Cir. 1993); *United States v. Alcan Aluminum Corp.*, 990 F.2d 711, 722 (2d Cir. 1993); *United States v. Alcan Aluminum Corp.*, 964 F.2d 252, 269 (3d Cir. 1992).

160. For general criticism of CERCLA's effectiveness, see *Administration of the Federal Superfund Program: Hearings Before the Subcomm. on Investigations and Oversight of the House Comm. on Public Works and Transportation*, 102d Cong., 2d Sess. 517-71 (1992) (containing a GAO report entitled PROBLEMS WITH THE COMPLETENESS AND CONSISTENCY OF SITE CLEANUP PLANS); see also HAZARDOUS WASTE, *supra* note 150, § 14.01[1].

161. Possibly the first case to be cited widely was *Amoco Oil Co. v. Borden, Inc.*, 889 F.2d 664, 670 (5th Cir. 1989) (requiring the plaintiff to establish a "standard of justification" for why a release has "caused the incurrence of response costs"); see also *United States v. Stringfellow*, 661 F. Supp. 1053, 1060 (C.D. Cal. 1987) (noting that a court may use equitable factors when apportioning damages); *United States v. A&F Materials Co.*, 578 F. Supp. 1249, 1256-57 (S.D. Ill. 1984) (concluding that the joint and several liability versus apportionment issue may depend on equitable considerations, particularly in connection with contributors of low quantities of waste to a site).

162. 866 F. Supp. 1481 (N.D. Ind. 1994).

163. *Id.* at 1489. More completely, the court stated that a CERCLA plaintiff must establish that the defendant produced "a continuous and predictable waste stream that included hazardous constituents of the sort eventually found at the site, and that at least some significant part of that continuous and predictable waste stream was disposed of at the site." *Id.* The court did not burden the plaintiff with "fingerprinting" the very toxins located at the hazardous waste site as coming from a par-

Judge Miller's opinion is not isolated in its interpretation of the CERCLA plaintiff's burden of proof<sup>164</sup> and is consistent with a recent EPA policy guideline on CERCLA liability.<sup>165</sup>

From Rachel Carson's moral perspective, eliminating retroactive liability and elevating the intent and causation elements in establishing CERCLA liability would represent a decided step away from a view of environmentalism as a moral and instinctive human responsibility. Rachel Carson condemns intentional pollution and purposeful or negligent ignorance of environmental consequences as morally irresponsible or worse, but ultimately focuses on the need to control toxins, recognize the long-term dangers of leaving toxins in the environment, and restore and maintain a balance in nature. These goals are difficult, if not impossible, when our responsibility for the environment is cast as a legal relationship that parallels our legal relationships with other persons.

### III. THE LAW OF NATURAL RESOURCE DAMAGES

Perhaps more than any other environmental law concept, NRD has the potential to represent progress toward a legal structure that incorporates Carson's philosophy. The NRD concept can be found in statutory language as early as 1973.<sup>166</sup> Until recently, however, the cause of action for NRD authorized under the major federal statutes addressing NRD has lain dormant, hibernating until a time when positive political attention creates a hospitable environment for NRD survival and the implementation of new regulations marks the path to legal via-

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ticular source. Instead, the court attempted to shield from liability those defendants whose waste was highly unlikely to have contributed significantly to toxic conditions at the site requiring response actions. *Id.* at 1533.

164. See *B.F. Goodrich Co. v. Murtha*, 840 F. Supp. 180, 184 (D. Conn. 1993) (refusing to extend CERCLA liability when no direct evidence of disposal at the site was supplied); *B.F. Goodrich Co. v. Murtha*, 815 F. Supp. 539, 544 (D. Conn. 1993) (holding that proof of disposal is necessary to extend liability); *Barnes Landfill, Inc. v. Town of Highland*, 802 F. Supp. 1087, 1088 (S.D.N.Y. 1992) (requiring proof that the defendant actually contributed hazardous waste to the site).

165. U.S. ENVIRONMENTAL PROTECTION AGENCY, GUIDANCE ON CERCLA SETTLEMENTS WITH DE MICROMIS WASTE CONTRIBUTORS (1993).

166. See Trans-Alaska Pipeline Authorization Act, 43 U.S.C §§ 1651-1656 (1988 & Supp. V 1993).

bility.<sup>167</sup> At present, harbingers of the full and active exercise of NRD claims are discernable.<sup>168</sup> Regulations have been formulated, with some finalized and some in draft form.<sup>169</sup> The final rule issued by the DOI is presently undergoing review in the District of Columbia Circuit.<sup>170</sup>

This state of budding development, occurring one human generation after Rachel Carson's death in 1964, presents a special opportunity for examining the durability of her philosophy in environmental law.<sup>171</sup> As a means of translating environmental losses into financial liabilities, a concept yet to be satisfactorily addressed in American law and politics, the law of NRD has spawned debate on its potential for unfairly imposing irresponsibly-derived, nontraditional business costs on members of commerce and industry.<sup>172</sup> The debate over the NRD liability scheme allows us to observe just how sturdy the Carsonian concepts set forth above have become in the law, or whether old debates on issues such as environmental law's unfairness and the threat it presents to the United States economy have some-

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167. NRD's dormancy may be in part due to the fact that EPA has historically focused its energy on cleanup issues rather than on natural resource damages. At present, EPA is not a NRD trustee and therefore has no statutory duties regarding NRD. See Kevin A. Gaynor & Carol E. Dinkins, *Natural Resource Damages Under CERCLA and OPA '90*, in THE NEW RULES FOR NATURAL RESOURCE DAMAGE ASSESSMENTS AND CLAIMS UNDER CERCLA AND OPA 412, 422 (1994) [hereinafter THE NEW RULES]. In addition, the 1986 amendments to Superfund, the Superfund Amendments and Reauthorization Act (SARA), cut off the availability of the Superfund Trust Fund for NRD claims, creating another hurdle for NRD restoration. See SARA, 26 U.S.C. § 9507(c)(1) (1988); see also CERCLA, 42 U.S.C. §§ 9611(e)(2), (i) (1988 & Supp. V 1993) (limiting, but not precluding, use of the Fund).

168. SARA added language to CERCLA, mandating the coordination of NRD assessments with cleanup activities. See SARA, 42 U.S.C. § 9604(b)(2).

169. See *supra* note 28.

170. *Chamber of Commerce v. United States Dep't of the Interior*, Nos. 94-1462, 94-1467, 94-1468, 94-1470, 94-1472, 94-1474 (D.C. Cir. filed July 21, 1994).

171. This Article is limited to a study of federal NRD, although provisions within CERCLA ensure that it does not preempt states from imposing liabilities addressed by the Act. CERCLA, 42 U.S.C. §§ 9614(a), 9652(d). A number of states have enacted environmental statutes relating to natural resource injury. See, e.g., FLA. STAT. ANN. § 376.121 (West Supp. 1995); MICH. COMP. LAWS ANN. ch. 324, § 11151 (West Supp. 1995); TEX. NAT. RES. CODE ANN. § 40.107 (West Supp. 1995).

172. See Rebecca W. Thomson, *Expert Testimony on "New Age" Numbers: The Use of Contingent Valuation Methodology To Assess Natural Resource Damages*, in THE NEW RULES, *supra* note 167, at 599, 611-12.

how regained their fire.

In addition, the present state of NRD development offers more than just a chance to test the endurance of "traditional" environmental legal battles. Conceptually, NRD surpasses the more familiar CERCLA scheme, in which those whose profitable activities produce hazardous waste must bear responsibility for cleaning up the environment. Under NRD, those whose profitable activities defile the environment must nurture the environment back to health and also pay what might be termed pain and suffering costs to the public for its loss of enjoyment of the environment during the period of environmental convalescence.<sup>173</sup> In this way, NRD may represent a significant step forward in the law's recognition of the earth-human relationship from Carson's perspective.

This section outlines the present state of NRD, briefly reviewing one of the major federal statutes and implementing regulations that translate injuries to natural resources into liabilities. Part IV then applies the principles of Rachel Carson's philosophy, as identified in Part II, to the law of NRD.

#### *A. A Brief Overview of Natural Resource Damages As Addressed Under Federal Law*

*I contend . . . that we have allowed . . . chemicals to be used with little or no advance investigation of their effect on soil, water, wildlife, and man himself. Future generations are unlikely to condone our lack of prudent concern for the integrity of the natural world that supports all life.*<sup>174</sup>

*Although man's record as a steward of the natural resources of the earth has been a discouraging one, there has long been a certain comfort in the belief that the sea, at least, was inviolate, beyond man's ability to change and despoil. But this belief, unfortunately, has proved to be naive.*<sup>175</sup>

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173. See CWA, 33 U.S.C. §§ 1321(f)(4), (5) (1988); OPA, 33 U.S.C. § 2706 (Supp. V 1993); CERCLA, 42 U.S.C. § 9607(f)(1).

174. CARSON, *supra* note 22, at 13.

175. CARSON, *supra* note 126, at xi.

In modern environmental law, the NRD concept was first used in the Trans-Alaska Pipeline Authorization Act of 1973.<sup>176</sup> The Deepwater Port Act of 1974 also addressed NRD.<sup>177</sup> These acts did not imbue NRD liability with broadly applicable significance because each act focused on a particular, designated natural resource. Congress first addressed NRD as a generalized claim for oil spills in navigable waters in the Clean Water Act Amendments of 1977, under which the president appoints trustees representing the United States or a state.<sup>178</sup> These trustees are authorized to sue for "expenses incurred by the Federal Government or any State government in the restoration or replacement of natural resources damaged or destroyed as a result of a discharge of oil or a hazardous substance" that violates the Act.<sup>179</sup>

In 1980, Congress marked the amphibious evolution of the NRD concept by including a claim for NRD to nonaqueous resources in CERCLA.<sup>180</sup> CERCLA-broadened the NRD claim to include injury to the environment from hazardous substances in

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176. The Act makes the owners of pipeline rights-of-way strictly liable to all damaged parties, public or private, without regard to fault for such damages, and without regard to ownership of any affected lands, structures, fish, wildlife, or biotic or other natural resources relied upon by Alaska Natives, Native organizations, or others for subsistence or economic purposes [for damages resulting from activities along or in the vicinity of the Trans-Alaskan pipeline right-of-way].

43 U.S.C. § 1653(a)(1) (1988).

177. See 33 U.S.C. § 1517(i)(3) (1988).

178. The CWA states that "[t]he costs of removal of oil or a hazardous substance . . . shall include any costs or expenses incurred by the Federal Government or any State government in the restoration or replacement of natural resources damaged or destroyed as a result of a discharge of oil or a hazardous substance." CWA, 33 U.S.C. § 1321(f)(4) (1988).

In addition, "[t]he President, or the authorized representative of any State, shall act on behalf of the public as trustee of the natural resources to recover for the costs of replacing or restoring such resources. Sums recovered shall be used to restore, rehabilitate, or acquire the equivalent of such natural resources . . ." *Id.* § 1321(f)(5). Because the CWA NRD claim is implemented through the DOI regulations implementing CERCLA, and because it has not spawned the case law or theoretical debates that have arisen under the CERCLA NRD claim, this Article does not discuss the CWA NRD claim separately from its discussion of the CERCLA NRD claim.

179. *Id.* § 1321(f)(4).

180. CERCLA, 42 U.S.C. §§ 9607(a)(4)(C), (f)(1) (1988).

addition to oil.<sup>181</sup> Finally, the Oil Pollution Act (OPA) was promulgated in major part to address natural resource damages that resulted from a spill of oil into the Prince William Sound from the oil tanker *Exxon Valdez*.<sup>182</sup> In a number of ways, the OPA expands upon and strengthens the claim authorized under the CWA.<sup>183</sup>

### *B. Natural Resource Damages Under Superfund*

CERCLA was promulgated in 1980, in part to address the cleanup, or "corrective action," provisions of the Resource Conservation and Recovery Act (RCRA) on a broader scale.<sup>184</sup> Due to the breadth of its authority and the singularity of its focus, CERCLA stands as "the centerpiece of the federal hazardous substance cleanup and liability program. It provides broad authority for the federal government . . . to identify, investigate, and clean up sites where hazardous substances have been or

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181. *Id.*

182. 33 U.S.C. §§ 2701-2761 (Supp. V 1993). OPA liability is established when a discharge of oil from a vessel or facility results in injury to natural resources or services in navigable waters, adjoining shorelines, or the exclusive economic zone. See *id.* §§ 2702(a), (b)(2). Although differences exist between a NRD claim brought under the OPA and one brought under CERCLA, the two acts structure the liability action in similar terms. Likewise, the OPA draft rule sets forth procedural and technical models for trustees to follow in assessing NRD that are similar to those set forth in the DOI rule implementing the NRD claim under CERCLA and the CWA. The NOAA draft rule is distinguishable from the DOI final rule in a number of ways, but, because the distinctions for the most part do not impact the evaluation of those rules for their adherence to Rachel Carson's philosophy, this Article limits its statutory and regulatory examination primarily to CERCLA and the DOI rule. For a comparative analysis of the DOI rule and the NOAA draft rule, see Linda Burlington, *Relationship of OPA Rule to CERCLA Rule Found at 43 CFR Part 11*, in *THE NEW RULES*, *supra* note 167, at 459; Kevin M. Ward, *Natural Resource Damage Provisions Under CERCLA and the Oil Pollution Act*, in *THE NEW RULES*, *supra* note 167, at 432.

183. For a thorough discussion of the relationship between the OPA and the CWA, see *Sun Pipe Line Co. v. Corewago Contractors, Inc.*, 39 Env't Rep. Cas. 1710 (BNA) (M.D. Pa. 1994).

Other statutes addressing NRD include the Outer Continental Shelf Lands Act Amendments, 43 U.S.C. § 1813(a)(2)(C) (1988), and 16 U.S.C. §§ 1443(a)(1), (2) (1988).

184. RCRA, 42 U.S.C. § 6973 (1988) (authorizing government suits and administrative orders to respond to imminent hazards involving hazardous wastes).

may be released into the environment."<sup>185</sup>

Environmental lawyers are familiar with CERCLA liability for the cleanup of hazardous waste, a collection of activities administered by EPA and identified in CERCLA as "response" actions.<sup>186</sup> In addition to its widely recognized cleanup function, CERCLA includes authority for specified parties to bring claims for "damages for injury to, destruction of, or loss of natural resources, including the reasonable costs of assessing such injury, destruction, or loss resulting from . . . a release [of hazardous substances to the environment]."<sup>187</sup> The assessment of NRD is meant to function in conjunction with the more widely experienced CERCLA response action, with NRD liability determined and recovered for those natural resource injuries and losses that are not fully remedied by the response action. NRD liability is therefore premised on response action liability, and an incident resulting in a natural resource injury for which liability can be found under CERCLA must be premised on a threatened or actual release of a hazardous substance as defined in that statute.<sup>188</sup> Conceivably, where a response action fully restores, rehabilitates, replaces, or acquires the equivalent of an injured natural resource, NRD would be limited to the value of lost use of the resource during the time response actions were conducted.<sup>189</sup>

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185. HAZARDOUS WASTE, *supra* note 150, § 12.01[2].

186. CERCLA, 42 U.S.C. § 9601(25) (1988).

187. *Id.* § 9607(a)(4)(C).

188. CERCLA defines "release" as "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing any hazardous substance or pollutant or contaminant)." *Id.* § 9601(22).

Removal actions and remedial actions, which, together with enforcement activities, make up response actions, are described in detail in CERCLA. *Id.* §§ 9601(23)-(24). Together, removal and remedial actions encompass a broad spectrum of activities, from initially evaluating a release through neutralizing its toxicity, and include health-related precautions, such as providing security fencing and alternative water supplies and even permanently relocating persons from the vicinity of a hazardous substance site. *Id.*

189. Losses of natural resources appropriate for NRD, however, are not limited to post-response action losses. See *Alaska Sport Fishing Ass'n v. Exxon Corp.*, 34 F.3d 769, 772 (9th Cir. 1994) (stating that "the government trustees are entitled to recover for all lost use damages on behalf of the public, from the time of any release

CERCLA defines "natural resources" to include "land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States, . . . any State or local government, any foreign government, [or] any Indian tribe."<sup>190</sup> CERCLA defines "damages" in its legal sense, as "damages for injury or loss of natural resources as set forth in section 9607(a) or 9611(b) of this title."<sup>191</sup> In essence, CERCLA provides statutory authority for government trustees to translate injuries, destruction, and other losses suffered by nature into monetary values, and to collect those monetary values from responsible parties in the form of legal damages.<sup>192</sup>

A key phrase in this alchemic formula left undefined by CERCLA is "injury to, destruction of, or loss of natural resources."<sup>193</sup> Furthermore, CERCLA does not specify the standard of proof necessary for showing that a particular discharge or release caused a particular injury to a natural resource.

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until restoration"); see also 43 C.F.R. § 11.15(a)(1)(ii) (1994) (stating that damages are to be calculated from the "onset of the discharge"); *Ohio v. United States Dep't of the Interior*, 880 F.2d 432, 454 n.34 (D.C. Cir. 1989) (concluding that "Congress intended damages to at least cover restoration costs").

190. CERCLA, 42 U.S.C. § 9601(16).

191. *Id.* § 9601(6). CERCLA makes defendants liable for, among other ills, "damages for injury to, destruction of, or loss of natural resources, including the reasonable costs of assessing such injury, destruction, or loss." *Id.* § 9607(a)(4)(c). The Act addresses limitations to the use of the Hazardous Substance Superfund, 26 U.S.C. § 9507(A) (1988), to cover costs associated with NRD claims. CERCLA, 42 U.S.C. § 9611(b)(2)(B). CERCLA also exempts NRD assessment costs from constraints imposed on Fund use for "claims" associated with injury to natural resources. *Id.* § 9611(c)(1). Although in certain provisions the statute may appear to use the term "damages" in its nonlegal sense, see *id.* § 9607(f)(1) (appearing to use the term "damages" as both a synonym for "injury" and as a legal term), at least one court has addressed the issue and concluded that natural resource "damages" refers to a "monetary quantification stemming from an injury" to a natural resource, *In re Acushnet River & New Bedford Harbor Proceedings re Alleged PCB Pollution*, 716 F. Supp. 676, 681 (D. Mass. 1989).

192. Under CERCLA, the trustees may be federal, state, or local government officials or Indian tribal officials. See CERCLA, 42 U.S.C. § 9607(f)(1). Federal trustees include divisions within the DOI, the National Park Service, the Bureau of Land Management, the Fish and Wildlife Agency, and the NOAA, which oversees fisheries and marine mammals.

193. *Id.*



CERCLA does, however, assign to the President or his delegatee, in this case, the DOI, the responsibility to develop regulations implementing NRD assessment "for injury to, destruction of, or loss of natural resources resulting from a release of oil or a hazardous substance" as addressed under CERCLA and the CWA.<sup>194</sup> Furthermore, CERCLA designates that the NRD regulations set forth both "standard procedures for simplified assessments" and "alternative protocols" for situations not adaptable to the standardized procedures.<sup>195</sup>

The first DOI regulations promulgated under this directive addressed the "alternative protocols" and have been dubbed the "Type B" rules. These were first published in 1986, and were amended and republished in 1988.<sup>196</sup> Final "Type A" rules setting forth the "standard methodologies for conducting simplified natural resource damage assessments" were published in 1987 and amended in 1988.<sup>197</sup> In essence, both types of rules prescribed phased actions and analyses for deriving a NRD assessment value and presenting a demand for damages to defendants.<sup>198</sup> Type A assessments use computer models to deter-

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194. *Id.* § 9651(c)(1). The President delegated this rulemaking responsibility to the DOI. See Executive Order No. 12316, 46 Fed. Reg. 42,237 (1981), amended by Executive Order No. 12580, 3 C.F.R. 193 (1988). In keeping with the statutory directive, the DOI regulations cover both CERCLA NRD for releases of hazardous substances to the uncontrolled natural environment and NRD due to oil spills into navigable waters under the CWA. 43 C.F.R. § 11.10 (1994).

195. CERCLA, 42 U.S.C. § 9651(c)(2) (requiring that the regulations identify "the best available procedures to determine such damages, including both direct and indirect injury, destruction, or loss and . . . [take] into consideration factors including, but not limited to, replacement value, use value, and the ability of the ecosystem or resource to recover").

196. 43 C.F.R. §§ 11.60-.84 (1994) (codifying 51 Fed. Reg. 27,674 (1986) and 53 Fed. Reg. 5166 (1988)).

197. 43 C.F.R. §§ 11.40-.41 (1994) (codifying 52 Fed. Reg. 9042 (1987) and 53 Fed. Reg. 9769 (1988)).

198. Phase I is the preassessment phase, during which a potential defendant must notify the trustee of potential damage to natural resources and the trustee conducts an initial assessment of whether natural resources have been affected by a release. 43 C.F.R. §§ 11.20-.25 (1994). Phase II requires the trustee to develop a systematic assessment strategy. *Id.* §§ 11.30-.35. Phase III is the assessment stage, during which the trustee will conduct either a Type A or a Type B assessment. *Id.* §§ 11.40, .60. Phase IV, the postassessment phase, is when the trustee compiles a report documenting the assessment, *id.* § 11.90, and provides the "potentially responsible party a demand in writing for a sum certain," *id.* § 11.91.

mine NRD.<sup>199</sup> Type B assessments, used in ecological situations not addressable by the computer models,<sup>200</sup> substitute for the computer modeling a three-step process to identify the natural resource injury,<sup>201</sup> quantify the loss of services the natural resource would have provided,<sup>202</sup> and assign a dollar amount to the injury and loss of services.<sup>203</sup>

Both regulatory efforts were immediately challenged by states, environmental organizations, and chemical companies, who combined forces to launch two legal actions demanding review of the regulations in the District of Columbia Circuit.<sup>204</sup> The D.C. Circuit issued opinions on July 14, 1989, in *Ohio v. United States Department of the Interior*<sup>205</sup> and *Colorado v. United States Department of the Interior*.<sup>206</sup> Possibly the most significant aspect of the court's determinations was its rejection of the directive in the Type B rules that NRD be assessed as "the lesser of: restoration or replacement costs; or diminution of use values."<sup>207</sup> The court interpreted CERCLA as mandating that restoration costs were to be given a "distinct preference" over diminished use value in measuring NRD.<sup>208</sup> The court provided

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199. 43 C.F.R. § 11.41(a) (1994). At present, Type A computer models have been developed only for coastal and marine environments. *Id.* The DOI has announced that it is developing a computer model assessment procedure for Great Lakes environments. 53 Fed. Reg. 20,143 (1988); 54 Fed. Reg. 39,015 (1989).

200. 43 C.F.R. § 11.33 (1994).

201. 43 C.F.R. § 11.61 (1994).

202. 43 C.F.R. § 11.70 (1994).

203. 43 C.F.R. § 11.80 (1994).

204. See CERCLA, 42 U.S.C. § 9613 (1988) (providing that any member of the public may petition the Court of Appeals for the District of Columbia Circuit to review any regulation promulgated under CERCLA).

205. 880 F.2d 432 (D.C. Cir. 1989).

206. 880 F.2d 481 (D.C. Cir. 1989).

207. *Ohio*, 880 F.2d at 441 (quoting 43 C.F.R. § 11.35(b)(2) (1987) (emphasis added)). The court upheld a number of challenged regulatory provisions, including provisions requiring satisfaction of certain acceptance criteria to establish causation of injury and those allowing the "contingent valuation" methodology for determining lost use values. *Id.* at 470, 476-77.

208. *Id.* at 459. The court illustrated the "enormous practical significance" of the "lesser of" rule with an example most likely drawn from the then-recent *Exxon Valdez* oil spill:

[I]magine a hazardous substance spill that kills a rookery of fur seals and destroys a habitat for seabirds at a sealife reserve. The lost use value of the seals and seabird habitat would be measured by the market

that when restoration costs are "grossly disproportionate" to use value, an inquiry into use value is appropriate.<sup>209</sup> The court noted, however, that the rules direct that use value not be limited to market value, but include nonconsumptive use value as well.<sup>210</sup> In *Colorado*, the court ordered the DOI to amend the Type A rules in keeping with the holding in *Ohio* regarding the use of restoration and lost use values.<sup>211</sup>

In accordance with these directives from the D.C. Circuit, the DOI summary of the regulations published in March 1994, maintains that the Type B rule "establishes a procedure for calculating natural resource damages based on the costs of restoring, rehabilitating, replacing, and/or acquiring the equivalent of injured resources" while also "allow[ing] for the assessment of all use values of injured resources that are lost to the public pending completion of restoration, rehabilitation, replacement, and/or acquisition of equivalent resources."<sup>212</sup>

Both the *Ohio* decision and the DOI regulations issued in response contain language that comports with Rachel Carson's philosophy. On a pragmatic level, the "lesser of" rule for assessing the value of despoiled resources would have allowed polluters to pay damages for the destruction of natural resources well below the cost of nurturing them back to health, thus breaching Carson's commitment to the web of life. On a theoretical level, using market value to assess the damages for injury to natural resources would have gutted NRD law of any element of Carson's principled belief that humans instinctively value nature for far more than its service to us. The *Ohio* decision, in reject-

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value of the fur seals' pelts (which would be approximately \$15 each) plus the selling price per acre of land comparable in value to that on which the spoiled bird habitat was located. Even if, as likely, that use value turns out to be far less than the cost of restoring the rookery and seabird habitat, it would nonetheless be the only measure of damages eligible for the presumption of recoverability under the Interior rule.

*Id.* at 442 (footnotes omitted).

209. *Id.* at 459.

210. *Id.* at 463-64.

211. *Colorado v. United States Dep't of the Interior*, 880 F.2d 481, 491 (D.C. Cir. 1989).

212. 59 Fed. Reg. 14,262 (1994) (stating that "[t]he Department will soon issue a new proposed rule to address assessment of lost nonuse values of injured resources").

ing the "lesser of" rule, thus prodded the DOI to regulate from a more Carsonian perspective.

These strides toward an environmental legal scheme of which Carson would approve were taken from within a framework of dense technical regulations, the bulk of which were approved by the court in *Ohio*. The recently issued DOI regulations thus match their predecessors by establishing an administrative process and several technical methods for assessing the damage to natural resources.<sup>213</sup> Like the former version, the 1994 DOI regulations structure the assessment process into four stages, the third of which addresses assessment plan implementation and is divided into three steps: injury determination, quantification, and damage determination.<sup>214</sup> Two of these three assessment implementation steps, injury determination and damage determination, have spawned complex regulatory problems, including problems in developing a system for valuing natural resources and problems in developing a means of connecting an injury to a natural resource to a particular act of pollution.<sup>215</sup> In addition to inviting a great deal of technical scrutiny, the issues that have developed in connection with injury determination and damage determination are ready ground for analysis as to whether they promote or betray Rachel Carson's philosophy.<sup>216</sup>

#### IV. EVALUATING NATURAL RESOURCE DAMAGES LAW FOR ADHERENCE TO RACHEL CARSON'S PHILOSOPHY

The examination in Part II of how and where elements of Rachel Carson's philosophy find voice in environmental laws indicates a pattern of initial post-*Silent Spring* adherence to the notes Carson sounded, followed by a recent trend against maintaining a special status for the environment that places the repair and protection of nature above legal concepts like fault and fairness. This section engages in a similar pattern of exami-

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213. See generally 43 C.F.R. pt. 11 (1994) (detailing the phased resource damage assessment process).

214. See *supra* notes 201-03 and accompanying text.

215. See *infra* part IV.B.1.

216. See *infra* part IV.B.2.

nation, but with a particular focus—gauging various aspects of the still-developing NRD program to determine where NRD stays true to Rachel Carson's philosophy and where it retreats.

At first blush, NRD language might appear to be an example of environmental law in its *least* philosophical form. The simple appearance in a number of major federal statutes of the term "natural resource damages" does not signify any particular stride toward protecting people's rights to enjoy nature or toward utilizing the law to promote long-range ecological diversity. After all, the term "natural resource" is utilitarian by definition,<sup>217</sup> thereby indicating that NRD might simply constitute a means by which fishermen and farmers may attain compensation for lost profits due to pollution of their natural commodities.<sup>218</sup>

As do certain features of CERCLA, the court's analysis of NRD in *Ohio* indicated that the law of NRD is not to be bound by any such limited, profit-oriented reading. For example, the simple distinction in CERCLA section 107 between response action liability and NRD liability indicates a legislative recognition that the eradication of a toxic health threat through a response action does not fully address the problems visited on the natural environment by toxins.<sup>219</sup> In contrast, CERCLA expressly constrains NRD claims with legal limitations that do not apply to response action claims. CERCLA allows private causes of action for response cost claims only,<sup>220</sup> prohibits NRD claims

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217. See, e.g., WEBSTER'S NINTH NEW COLLEGIATE DICTIONARY 788 (1985) (defining "natural resource" as "industrial materials and capacities (as mineral deposits and waterpower) supplied by nature"); WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 1507 (1986) ("capacities (as native wit) or materials (as mineral deposits and waterpower) supplied by nature"); cf. BLACK'S LAW DICTIONARY 1027 (6th ed. 1990) ("Any material in its native state which when extracted has economic value. . . [and also] features which supply a human need and contribute to the health, welfare, and benefit of a community, and are essential to the well-being thereof . . .").

218. Carson teaches us that our distinctions between elements of nature that have some utility to humans and those that do not is meaningless. Using narrative factual essay, Carson shows how all environmental degradation is connected and how significant alterations of any segment of the environment at some point affect some direct, utilitarian resource to humans. See CARSON, *supra* note 22, at 2, 3, 8, 43, 50 (reviewing effects on the drinking water supply, livestock, crops, health, and fish supplies).

219. See CERCLA, 42 U.S.C. §§ 9607(a)(4)(A), (a)(4)(C) (1988).

220. See, e.g., *Satsky v. Paramount Communications, Inc.*, 7 F.3d 1464 (10th Cir.

when injury to natural resources occurred pursuant to permitted or licensed activity, limits NRD to "sums . . . [which can be used] to restore, replace, or acquire the equivalent of such natural resources," and prohibits recovery "where such damages and the release of a hazardous substance from which such damages resulted have occurred wholly before December 11, 1980."<sup>221</sup> It thus appears that a Congress with the vision to recognize the importance of natural resource restoration nonetheless faltered when it legislated on the matter, weighing down the ecologically advanced NRD claim with legal checks and balances that Congress had seen fit to eliminate from other environmental laws.

This section examines NRD law in greater depth through use of the three facets of Carson's philosophy identified in Part II: the right to a clean environment, the responsibility to maintain species diversity, and the instinct to protect nature.

#### *A. NRD Law's Response to Carson's Right to a Nontoxic Environment: Revival of the Public Trust Doctrine*

*To the question "But doesn't the government protect us from [contamination by pesticides]?" the answer is, "Only to a limited extent."<sup>222</sup>*

As noted above, CERCLA allows private parties to bring actions for response costs, but does not provide for a private cause of action to recover for NRD.<sup>223</sup> In addition, states cannot re-

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1993) (discussing the fact that private parties may not bring claims for NRD).

221. CERCLA, 42 U.S.C. §§ 9607(a)(4)(B), (f)(1); see also *United States v. Wade*, 14 Env'tl. L. Rep. (Env'tl. L. Inst.) 20,435 (E.D. Pa. Feb. 2, 1984) (finding that a defendant may still be liable for NRD, even where the defendant demonstrates that the entire disposal took place before December 11, 1980, because releases to the environment could continue after that date). But cf. *In re Acushnet River & New Bedford Harbor Proceedings re Alleged PCB Pollution*, 716 F. Supp. 676, 686 (D. Mass. 1989) (holding that a trustee can recover for all damages to a resource when the defendant cannot establish that damages are divisible into pre- and post-December 11, 1980, amounts).

222. CARSON, *supra* note 22, at 181.

223. See *Artesian Water Co. v. New Castle County*, 851 F.2d 643, 644-45 (3d. Cir. 1988); *Lutz v. Chromatex, Inc.*, 718 F. Supp. 413, 419 (M.D. Pa. 1989); *United States v. Southeastern Pa. Transp. Auth.*, 17 Env'tl. L. Rep. (Env'tl. L. Inst.) 20,001 (E.D. Pa. July 2, 1986).

cover for damages to private parties or to purely private property.<sup>224</sup> Instead, CERCLA and other major statutes addressing NRD assign the responsibility to protect natural resources to government officials designated as trustees, public servants bound to act in the interest of present and future members of the public.<sup>225</sup> Trustee responsibility encompasses the natural resources "belonging to, managed by, controlled by, or appertaining to" the government trustee in question.<sup>226</sup>

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224. See *Ohio v. United States Dep't of the Interior*, 880 F.2d 432, 460-61 (D.C. Cir. 1989). The *Ohio* court found that Congress deliberately excluded private property from the definition of natural resources, but that trustees were authorized to protect more than natural resources on government-owned land. *Id.* at 461. "[A] substantial degree of government regulation, management, or other form of control over the property[, however,] would be sufficient to make the CERCLA natural resource damage provisions applicable. *Id.*; cf. *Idaho v. Southern Refrigerated Transp., Inc.*, No. 88-1279, 1991 WL 22479, at \*5 (D. Idaho Jan. 24, 1991) (holding that Idaho is a trustee under CERCLA and a common-law *parens patriae* for all of Idaho's wildlife and sport fish).

225. CERCLA authorizes trustees representing the United States or an individual state to sue for NRD, assigning to the President the task of designating federal officials to serve as trustees and to state governors the task of designating state officials to serve in that capacity. CERCLA, 42 U.S.C. §§ 9607(f)(1), (f)(2)(A)-(B). Under the OPA, the designated trustee may be a federal, state, or local government official, an Indian tribe official, or a trustee designated by a foreign government. See OPA, 33 U.S.C. § 2702(b)(2)(A) (Supp. V 1993). The CWA makes federal or state representatives eligible for trustee status. CWA, 33 U.S.C. § 1321(f)(5) (1988).

The President has designated the Secretaries of Defense, Interior, Agriculture, Commerce, and Energy as federal trustees of natural resources under their respective jurisdictions. Exec. Order No. 12580, 3 C.F.R. 193 (1988). In accordance with this directive, the National Contingency Plan designates various federal officials to act as trustee of natural resources under their jurisdiction. Officials designated include the Secretary of the Interior (migratory birds, marine mammals, endangered species, certain federally managed water resources, and other resources); the Secretary of Commerce (resources located in or under the continental shelf, tidally influenced waters, waters navigable by deep draft vessels, and other locations); and heads of other departments, such as Agriculture, Defense, and Energy (natural resources located on, over, or under land managed by an agency within the particular department). See 40 C.F.R. § 300.600(b) (1994). Some courts have extended the class of potential trustees to include municipalities. See *New York v. Exxon Corp.*, 633 F. Supp. 609, 619 (S.D.N.Y. 1986); *Mayor of Boonton v. Drew Chem. Corp.*, 621 F. Supp. 663, 667 (D.N.J. 1985); see also Peter H. Lehner, *Cities as Environmental Plaintiffs: A Guide to Municipal Enforcement of Environmental Laws*, 24 *Env't Rep.* (BNA) 2080 (Apr. 8, 1994) (detailing in what ways and for what reasons cities should enforce environmental laws).

226. CERCLA, 42 U.S.C. § 9607(f)(1); OPA, 33 U.S.C. §§ 2706(a)(1)-(4) (Supp. V 1993). Consistent with the breadth of government authority under the common-law

Historically, government officials have protected the interests of the public in nonprivate lands under the doctrine of public trust, and the NRD trustee structure hearkens back to this underutilized model for environmental protection.<sup>227</sup> The public trust doctrine dates back to Roman civil law, and its mystique as an ancient but enduring doctrine for the benign defense of the earth's wild creatures, shorelines, waters, wetlands, parklands, and even air against human predators is consistent with Carson's philosophy.<sup>228</sup> Use of the public trust doctrine, however, has generally been confined to ensuring public access to navigable waters and adjacent shorelines,<sup>229</sup> and, in at least one recent case involving a state's attempt to protect its shoreline, no member of the Supreme Court made mention of the public trust, even in passing, as a potential argument in favor of the state's regulation.<sup>230</sup> From this perspective, the incorporation of the public trust model into the NRD provisions of several major statutes may represent a positive reminder to government officials, particularly those in the agriculture, forestry, and other environmentally related agencies, that overriding all of their individual actions and decisions is an obligation to

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doctrine of public trust, the preamble to the 1994 DOI NRD rules indicates that the regulations are "available for assessments of all natural resources covered by CERCLA, which under the plain language of the statute includes more than just resources owned by the government," and that recovery under the rule should not hinge "solely on ownership of a resource by a government entity." 59 Fed. Reg. 14,265 (1994). Rather than attempting to interpret more precisely the scope of the statutory definition, the DOI rule assigns to trustees the responsibility to explain the basis of asserted NRD authority in both the Notice of Intent to Perform an Assessment and in the Assessment Plan. *Id.*

227. See Thomas L. Eggert & Kathleen A. Chorostecki, *Rusty Trustees and the Lost Pots of Gold: Natural Resource Damage Trustee Coordination Under the Oil Pollution Act*, 45 BAYLOR L. REV. 291, 298 (1993); see also Anthony R. Chase, *Remedying CERCLA's Natural Resource Damages Provision: Incorporation of the Public Trust Doctrine into Natural Resource Damages Actions*, 11 VA. ENVTL. L.J. 353, 354 n.7 (1992) (outlining the historical scope of the public trust doctrine).

228. See Eggert & Chorostecki, *supra* note 227, at 296-97 n.30 (quoting WILLIAM H. RODGERS, JR., ENVIRONMENTAL LAW § 2.16, at 173 (1st ed. 1977) ("It takes no great inferential leap to conclude that public trust protection ought to be extended to all air, water, and land resources, the preservation of which is important to society.")).

229. See generally Joseph L. Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471 (1970) (detailing the nature of the public trust doctrine, past and present).

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



present and future generations to prevent an irrevocable imbalance in nature.

Of course, the trustee mandates in the NRD provisions of the major federal statutes and their implementing regulations do constrain trustees from the breadth of the common-law exercise of public trust authority. For example, CERCLA trustees may not recover for damages to natural resources caused by releases subject to federal permits.<sup>231</sup> In addition, defendants are not liable for damages to natural resources caused by releases that occur due to activity for which an EIS has been prepared under NEPA, when the EIS demonstrates that the NRD in question were identified as an "irreversible and irretrievable commitment of natural resources."<sup>232</sup> As noted above, the measure of damages excludes punitive damages and damages resulting from an event of pollution occurring wholly prior to CERCLA's enactment.<sup>233</sup> CERCLA does include the reasonable cost of assessing injury to natural resources in the scope of damages,<sup>234</sup> but inhibits trustees from utilizing the Fund to restore, rehabilitate, replace, or acquire the equivalent of natural resources.<sup>235</sup> These statutory limits on trustee operation, when combined with the daunting regulatory burdens inherent in the determinations of injury and damages, suggest that Congress has not yet wholeheartedly converted to Carson's philosophy.<sup>236</sup>

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231. CERCLA, 42 U.S.C. § 9607(f)(1) (1988).

232. *Id.*

233. See *supra* note 221 and accompanying text.

234. 42 U.S.C. § 9607(a)(4)(C).

235. *Id.* § 9611(i).

Except in a situation requiring action to avoid an irreversible loss of natural resources or to prevent or reduce any continuing danger to natural resources or similar need for emergency action, funds may not be used under this chapter for the restoration, rehabilitation, or replacement or acquisition of the equivalent of any natural resources until a plan for the use of such funds for such purposes has been developed and adopted by affected [trustees] . . . after adequate public notice and opportunity for hearing and consideration of all public comment.

*Id.*

236. See *infra* parts IV.B.1, IV.B.2 (discussing injury and damage determinations). Certain courts addressing the constraints on CERCLA trustees bringing NRD claims have evidenced clearer adherence to the Carson philosophy than Congress. For example, in *In re Acushnet River & New Bedford Harbor*, 722 F. Supp. 893 (D. Mass. 1989), Judge Young held that the defendants bore the burden of establishing that an

Perhaps a more elemental deviation from the Carson ideal regarding people's personal rights to live in a nontoxic environment is that CERCLA's NRD provisions allow only government trustees to assert the public trust rights of the general population.<sup>237</sup> This limitation does not represent a diminishment of NRD public trust protection from its common-law roots, as public trust has historically been asserted by states.<sup>238</sup> It does, however, redirect the individual's efforts to protect natural resources toward citizen suits to compel government trustees to carry out their duties,<sup>239</sup> and, in this redirection, may dilute the impact of NRD law more than Carson would find comfortable. In *Silent Spring*, Carson does not present herself as an individual who trusts her government to protect her rights, or

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event of pollution injuring natural resources was federally permitted. *Id.* at 901. In addition, Judge Young held that, when government trustees can demonstrate that at least some of the release of contamination to the environment was not federally permitted, the defendants bear the burden of establishing what portion of the damages should be allocated to the permitted release. *Id.* In an earlier decision, Judge Young had found that, when injury to natural resources has occurred both before and after CERCLA's enactment date, the defendant in a NRD action bears the burden of showing that NRD are divisible into pre- and post-CERCLA enactment amounts to avoid liability for pre-enactment damages. See *In re Acushnet River New Bedford Harbor Proceedings re Alleged PCB Pollution*, 716 F. Supp. 676, 686 (D. Mass. 1989). Finally, although CERCLA limits access to the Fund to respond to natural resource injuries, at least one court has found that "there is no requirement that money must be expended by the state before it can seek to recover for damages to natural resources." *New York v. General Elec. Co.*, 592 F. Supp. 291, 298 (N.D.N.Y. 1984).

237. See *supra* notes 225, 227 and accompanying text. In contrast, CERCLA also authorizes private parties to bring cost recovery suits for costs incurred in the clean-up of hazardous substances released to the environment. 42 U.S.C. § 9607(a)(4)(B).

238. See *Georgia v. Tennessee Copper Co.*, 206 U.S. 230, 237 (1907) (describing the state as the final authority over "whether its mountains shall be stripped of their forests and its inhabitants shall breathe pure air"); see also *Puerto Rico v. S.S. Zoe Colocotroni*, 628 F.2d 652, 671 (1st Cir. 1980) (citing *Hughes v. Oklahoma*, 441 U.S. 322, 337 (1979), as having rejected the erroneous theory that a state owns the wildlife within its borders, recognizing instead that "states retain an important interest in the regulation and conservation of wildlife and natural resources . . . 'as legitimate local purposes similar to the States' interests in protecting the health and safety of their citizens'" (citations omitted), *cert. denied*, 450 U.S. 912 (1981). But see *Gould v. Greylock Reservation Comm'n*, 215 N.E.2d 114 (Mass. 1966) (recognizing standing in five private citizens as beneficiaries of the public trust).

239. The citizen suit provisions of both CERCLA, and the CWA, 33 U.S.C. § 1365 (1988), provide private citizens with a legal means of forcing trustees who fail to adequately protect the natural resources entrusted to their care to fulfill their duties.

the rights of future generations, to a balanced environment. In a passage closing a lengthy cataloging of human and wildlife suffering due to DDT exposure, Carson wrote:

Who has decided—who has the *right* to decide—for the countless legions of people who were not consulted that the supreme value is a world without insects, even though it be also a sterile world ungraced by the curving wing of a bird in flight? The decision is that of the authoritarian temporarily entrusted with power; he has made it during a moment of inattention by millions to whom beauty and the ordered world of nature still have a meaning that is deep and imperative.<sup>240</sup>

Because NRD law relegates private attorneys general to the role of policing the work of government trustees, it shares, with other environmental laws, a shortcoming discussed in Part II.<sup>241</sup> Although citizens may have rights in the environment, their inability to directly assert those rights puts them at the mercy of a legal system not designed to override procedural and other legal technicalities on behalf of the ecosphere. Indeed, the plaintiffs in *Alaska Sports Fishing Ass'n v. Exxon Corp.*<sup>242</sup> may have enjoyed a rather hollow victory when the Ninth Circuit implicitly recognized their asserted claims in negligence and nuisance for the lost use and enjoyment of natural resources due to the *Exxon Valdez* oil spill.<sup>243</sup> Because this lost use could be addressed in the government trustee consent decree with Exxon, and because the individual plaintiffs were in privity with the NRD trustees under the doctrine of *parens patriae*, their private claims were barred under the doctrine of *res judicata*.<sup>244</sup>

### *B. NRD Law's Response to Carson's Recognition of the Importance of Maintaining Ecological Diversity*

The CERCLA hazardous waste cleanup program, remarkable for its sweeping liability and the paltry arsenal of affirmative

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240. CARSON, *supra* note 22, at 127.

241. See *supra* notes 71, 94-95 and accompanying text.

242. 34 F.3d 769 (9th Cir. 1994).

243. *Id.* at 772-73.

244. *Id.* at 773-74.

defenses it offers defendants,<sup>245</sup> is a statutory scheme that promotes Carson's view that cleaning up pollution is a more important social goal than measuring degrees of culpability. In contrast, the CWA, the OPA, and CERCLA all make clear from their statutory language alone that Congress intended to impose significant restraints on NRD liability. For example, CERCLA imposes a \$50 million cap on NRD liability for each release from a facility.<sup>246</sup> The CWA and the OPA contain similar limitations.<sup>247</sup> No such liability cap limits CERCLA clean-up liability.<sup>248</sup>

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245. The limited affirmative defenses against CERCLA liability include cases in which a defendant is able to establish that the contamination and its resulting damages, for which he is otherwise liable, "were caused solely by—(1) an act of God; (2) an act of war; (3) an act or omission of a third party [unrelated to the defendant in any way and associated with the release of contamination]; or (4) any combination of the [preceding defenses]." See CERCLA, 42 U.S.C. § 9607(b) (1988).

246. *Id.* §§ 9607(c)(1)(C)-(D). This cap is lifted if the release was caused by "willful misconduct or willful negligence" or by a violation of "applicable safety, construction, or operating standards or regulations." *Id.* § 9607(c)(2).

247. See CWA, 33 U.S.C. §§ 1321(f)(1)-(3) (1988) (setting a \$50 million cap on liability, which is lifted if the discharge was the result of "willful negligence or willful misconduct within the privity and knowledge of the owner"); see also *id.* § 1321(q) (authorizing the President to limit liability to less than \$50 million, but not less than \$8 million for onshore or offshore facilities); OPA, 33 U.S.C. § 2704 (Supp. V 1993) (setting liability caps for tank vessels (\$10 million), other vessels (\$500,000), offshore facilities other than deep water ports (removal costs plus \$75 million), and onshore facilities or deep water ports (\$350 million)). As in CERCLA and the CWA, the OPA removes such limits on liability if the incident "was proximately caused by—gross negligence or willful misconduct" or "the violation of an applicable Federal safety, construction, or operating regulation." *Id.* § 2704(c)(1). As in the CWA, the OPA authorizes the President to limit liability to not more than \$350 million and not less than \$8 million for onshore facilities. *Id.* § 2704(d)(1).

248. See 42 U.S.C.A. §§ 9601-9670 (West 1995). For further discussion of limitations to the CERCLA NRD claim not imposed on the response action claim, see *supra* notes 220-21, 244 and accompanying text; *infra* note 252 and accompanying text. One issue that has not been determined conclusively is whether a CERCLA NRD action may be brought in connection with a threat of release. CERCLA clearly provides that defendants may be liable for costs incurred in connection with cleanup actions taken in response to a threatened release. See *supra* notes 153-54 and accompanying text. The NOAA proposed regulations implementing the OPA also allow for the assessment of damages based on the diminished use of a resource resulting from the threat of an oil spill. 59 Fed. Reg. 39,827 (1995) (to be codified at 15 C.F.R. § 990.10 (proposed Aug. 3, 1995)). In contrast, the DOI regulations implementing CERCLA's NRD claim address only damages resulting from an actual release or discharge. 59 Fed. Reg. 14,279 (1994) (to be codified at 43 C.F.R. pt. 11).

This and other distinctions between cleanup liability and NRD liability indicate that, along with Congress's definitive prioritization in CERCLA of environmental cleanup over legal obstacles like fault and causation,<sup>249</sup> Congress also prioritized cleanup over NRD restoration and thus did not sweep the path to NRD enforcement clear of legal obstacles. Perhaps the most telling sign of congressional reticence to allow ready implementation of the ultimate goals of NRD was Congress's allocation of the burden of proving liability. For cleanup costs, CERCLA makes defendants liable for "all costs of removal or remedial action incurred by the [government plaintiff] not inconsistent with the [CERCLA regulations]."<sup>250</sup> Courts have interpreted this language as indicating that government cleanup actions and the costs incurred are to be considered presumptively and directly translated into liabilities.<sup>251</sup>

In contrast, when designating liability for NRD, CERCLA uses the term "damages for injury," whereas it uses the term "costs . . . incurred" in its cleanup liability section, thus requiring the plaintiff trustees to translate injuries, destruction, and losses suffered by natural resources into damages, or legal liabilities.<sup>252</sup> The girth of this burden on NRD trustees is difficult to comprehend until one engages in a cursory review of the DOI regulations detailing the method for establishing injury to natural resources.

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249. See *supra* notes 146-57 and accompanying text.

250. CERCLA, 42 U.S.C. § 9607(a)(4)(A).

251. For examples of cases interpreting the phrase "response costs" broadly, see *Piccolini v. Simon's Wrecking*, 686 F. Supp. 1063, 1068 (M.D. Pa. 1988) ("Congress intended the term 'response costs' to encompass a broad range of activities and that the provisions defining response costs be interpreted liberally."); *United States v. Northeastern Pharmaceutical and Chem. Co. (NEPACCO)*, 579 F. Supp. 823, 850 (W.D. Mo. 1984), *aff'd in part, rev'd in part*, 810 F.2d 726 (8th Cir. 1986), *cert. denied*, 484 U.S. 848 (1987).

252. Compare CERCLA, 42 U.S.C. § 9607(a)(4)(C) ("damages for injury") with *id.* § 9607(a)(4)(A) ("all costs . . . incurred").

*1. Injury Determination and the Acceptance Criteria: Law Confronts the Web of Life*

The DOI rule implementing the NRD provisions of CERCLA and the CWA sets forth a methodology under which trustees may identify and assess an "injury" to natural resources.<sup>253</sup> The general definition of "injury" in the regulations, applicable to all natural resources, is

a measurable adverse change, either long- or short-term, in the chemical or physical quality or the viability of a natural resource resulting either directly or indirectly from exposure to a discharge of oil or release of a hazardous substance, or exposure to a product of reactions resulting from the discharge of oil or release of a hazardous substance.<sup>254</sup>

This definition requires trustees to meet two burdens in establishing an injury to natural resources. First, trustees must establish the occurrence of an adverse change in the chemical or physical quality or the viability of a natural resource, detected through observation or scientific methods.<sup>255</sup> To assist trustees in meeting this requirement, the DOI regulations provide standards which, if exceeded, identify the presence of an injury.<sup>256</sup>

In addition, trustees must trace the adverse change in the resource to the hazardous substance or oil released or discharged by the defendant.<sup>257</sup> The requirement that trustees es-

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253. 43 C.F.R. § 11.60 (1994).

254. *Id.* § 11.14(v). In addition to the general definition of "injury," the DOI regulations set forth specific definitions for various types of natural resources addressed under CERCLA. *Id.* § 11.62. For air, surface water, and groundwater, the regulations reference existing federal and state regulatory standards and criteria. *Id.* §§ 11.62(b)-(d). For biological and geological resources, however, with the exception of federal and state consumption guidelines, no standards or criteria defining injury exist. For these resources, the DOI developed specific injury definitions. *Id.* §§ 11.62(e)-(f).

255. *Id.* §§ 11.62(e)-(f).

256. *Id.* § 11.62(f)(2). The method for establishing an adverse change in the viability of a biological resource relies on measurable biological symptoms, characteristics, or other indicators of diminished viability, such as death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions, or physical deformity of organisms. *Id.* § 11.62(f)(1)(i).

257. The regulation directs that trustees establish whether "one or more natural resources have been injured as a result of the discharge of oil or release of a hazardous substance." *Id.* § 11.13(e)(1).

establish a pathway of contamination linking the natural resource injury to the discharge or release that originally invoked liability constitutes a causation element; to establish an "injury" for which a defendant may be found liable, trustees must trace detrimental effects on natural resources back to a release of hazardous substances or discharge of oil that caused the detrimental effects and for which the defendant is responsible.<sup>258</sup>

To meet this second element of the injury requirement, trustees must establish that the measurable adverse biological change detected in the first step of the injury determination differs from any measurable adverse biological change occurring naturally to background population levels. Trustees also must establish that the measurable adverse biological change establishing injury exceeds any adverse changes resulting from other injury-causing factors in the general assessment area.<sup>259</sup> Finally, trustees must establish that the injured natural resources were *first* injured as a result of the defendant's polluting act.<sup>260</sup>

Trustees thus face a significant proof obstacle in the enforcement of their NRD obligations. Unfortunately for trustees, living organisms constantly respond to many presences and events in their natural habitat, with or without an event of pollution.<sup>261</sup> These presences and events may include nonhuman changes, such as weather changes, changes in heat or light, seasonal changes, changes in food supplies, changes caused by predators, and even changes caused by the presence of other members of the same species.<sup>262</sup> Organisms may also respond to effects humans visit on them or their habitats unrelated to a particular event of pollution, such as overfishing and habitat alteration.<sup>263</sup> In combination or indi-

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258. See *id.*

259. *Id.* § 11.62(f)(3).

260. See David R. Rosenberger, *Determination of Injury: In CERCLA's Natural Resource Damage Assessment Regulations*, presented at the seminar, "The New Rules for Natural Resource Damage Assessments and Claims Under CERCLA and OPA," Linda Burlington and William S. Rouch, Jr., Co-Chairs, 1994 (on file with Author).

261. *Id.*

262. *Id.*

263. *Id.*

vidually, these presences, events, and effects may easily result in an untraceable number of behavioral, biochemical, physiological, or genetic responses, any of which might be measurable as adverse. Indeed, it is difficult to imagine an adverse biological change to a natural resource that is not a response to a collection of causes.<sup>264</sup> In other words, due to the non-isolated nature of the ecosphere, an observed biological response occurring in the vicinity of a discharge or release does not easily allow trustees to reach a legal conclusion that the response was caused by the discharge or release and constituted an "injury" as defined by the DOI regulations. Without further investigation, such a situation only allows a conclusion that some presence or event, or combination of presences and events, in the organism's environment has or have negatively impacted its viability.<sup>265</sup>

## *2. NRD Injury/Causation: An Anti-Carsonian Roadblock in the Path of a Very Carsonian Goal*

Any reader of Rachel Carson must conclude that the requirement that trustees prove injury could eviscerate the NRD claim from within, because in the web of life no ecological change occurs in the sterile isolation required for proof of causation.<sup>266</sup> CERCLA attempts to save its NRD program from failing due to the very ecological phenomenon that the Act strives to respect by mandating that NRD regulations "identify the best available procedures to determine such damages."<sup>267</sup> This provision invites the legal conclusion that, as long as trustees adhere to whatever they are able to establish as the "best" standardized procedures for measuring injury, then the law will accept the injury-causation chain they forge, however fragile its links.

The standardized system for identifying and evaluating the procedures for measuring injury, dubbed the biological "acceptance criteria" in the DOI regulations, utilizes a screening mechanism to evaluate scientific and generally accepted knowledge about particular adverse biological responses to releases of pollu-

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264. *Id.*

265. *Id.*

266. See CARSON, *supra* note 22, at 5-13.

267. CERCLA, 42 U.S.C. § 9651(c)(2) (1988).



tion into the natural environment.<sup>268</sup> The acceptance criteria are the criteria under which trustees determine whether the scientific community would recognize a causal relationship between an event of pollution and a measured injury to a natural resource.<sup>269</sup>

Because the acceptance criteria are intended to be a means of identifying and utilizing the "best available" science, and because the best available science may be argued to be all CERCLA asks of trustees when identifying an injury to natural resources, the acceptance criteria might supply an answer to the NRD trustees' causation problem by supplying a semblance of the isolated causation chain that the law demands when the realities of actual ecological conditions and sketchy scientific knowledge would otherwise defeat a NRD claim. However, the acceptance criteria regulations do not legitimize unproven or rudimentary (albeit "best") science. The DOI recognized that some biological responses are not well understood by the scientific community.<sup>270</sup> For such biological responses, the acceptance criteria can lead to a conclusion that the "best" science is still inadequate to meet the causation standard of CERCLA.

It is somewhat ironic that the law addressing the assessment of damages for injury to natural resources, while so conceptually compatible with Rachel Carson's ideal that humans must respond to our instinct to respect and nurture our environment, should be severely handicapped in its operation due to its incompatibility with another primary teaching of Carson's, that of the

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268. 43 C.F.R. § 11.62(f)(2) (1994). The regulations set forth four acceptance criteria. The first acceptance criterion is met when the biological response observed is often the result of exposure to oil or hazardous substances. *Id.* § 11.62(f)(2)(i). The second acceptance criterion is met when exposure to oil or hazardous substances is known to cause the observed biological response in free-ranging organisms. *Id.* § 11.62(f)(2)(ii). The third acceptance criterion is met when exposure to oil or hazardous substances is known to cause the observed biological response in controlled experiments. *Id.* § 11.62(f)(2)(iii). The final acceptance criterion is met when the biological response measurement is practical to perform (sufficiently routine) and produces scientifically valid results. *Id.* § 11.62(f)(2)(iv). For a list of the 18 types of biological responses in fish and wildlife species, including both lethal and sublethal responses, that have been found to satisfy the acceptance criteria, see *id.* § 11.62(f)(4).

269. See 43 C.F.R. § 11.62(f) (1994).

270. See 51 Fed. Reg. 27,710 (1986) (responding to comments).

interconnectedness of all members of the ecosphere. In *Ohio v. United States Department of the Interior*,<sup>271</sup> the plaintiffs characterized the acceptance criteria as being extraordinarily burdensome and as requiring a greater quantum of evidence of causation than the common law required.<sup>272</sup> The D.C. Circuit responded by stating that "legislative history illustrates . . . that a motivating force behind the CERCLA natural resource damage provisions was Congress' dissatisfaction with the common law."<sup>273</sup> A committee print states that causation-of-injury standards were one of the common-law obstacles to recovery for environmental harms that CERCLA was intended to eliminate:

[P]laintiffs in toxic pollution suits may have substantial difficulty in proving that a particular exposure to a pollutant was the cause in fact of an injury. The case studies reinforce the notion that such problems of proof can be significant barriers to recovery.<sup>274</sup>

The court ruled in *Ohio*, however, that CERCLA is ambiguous on the question of whether the causation-of-injury standard under CERCLA section 107(a)(4)(C) must be less demanding than that of common law and therefore upheld the acceptance criteria.<sup>275</sup> The causation-of-injury burden on NRD trustees thus stands firm as possibly the single most significant indicator of the law's reticence to embrace Carson's ideal of environmentalism.

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271. 880 F.2d 432 (D.C. Cir. 1989).

272. *Id.* at 469.

273. *Id.* at 455; see also *id.* at 455 n.38 (citing S. REP. NO. 848, 96th Cong., 2d Sess. 13-14 (1980), for the proposition that "[t]raditional tort law presents substantial barriers to recovery . . . . [C]ompensation ultimately provided to injured parties is generally inadequate.").

274. *Id.* at 470 (quoting SENATE COMM. ON ENVIRONMENT AND PUBLIC WORKS, 96TH CONG., 2D SESS., SIX CASE STUDIES OF COMPENSATION FOR TOXIC SUBSTANCE POLLUTION: ALABAMA, CALIFORNIA, MICHIGAN, MISSOURI, NEW JERSEY, AND TEXAS; A REPORT PREPARED UNDER THE SUPERVISION OF THE CONGRESSIONAL RESEARCH SERVICE OF THE LIBRARY OF CONGRESS 517 (Comm. Print 1980)).

275. *Ohio*, 880 F.2d at 472.

*C. NRD "Contingent Valuation" and the Moral Instinct To Protect the Environment*

Conceptually, the most poetic and profound element of NRD law is the effort to reflect the nonutilitarian loss to humans of a polluted natural environment. CERCLA's simple directive that liability include damages for "loss of natural resources"<sup>276</sup> has spawned a great deal of debate over how and whether the law can derive a damage figure reflecting people's moral or emotional suffering due to their knowledge of harm to a species, habitat, or other element of the natural world.<sup>277</sup> Much of this debate has focused on the contingent valuation methodology (CVM), a survey method for deriving a dollar figure reflecting the sense of loss humans experience when a species is destroyed or its existence is threatened or when human access to and enjoyment of nature is made impossible by pollution.<sup>278</sup>

*1. Background and Overview of Contingent Valuation Methodology*

As noted above, the DOI regulations implementing CERCLA's NRD provisions were challenged in the *Ohio* and *Colorado* companion cases in part for designating NRD as the "lesser of" restoration and loss use values.<sup>279</sup> Following guidance from *Ohio*, the 1994 DOI regulations provide that the monetary measure of NRD is the estimated cost of the restoration, rehabilitation, replacement, or acquisition of equivalent resources.<sup>280</sup> In addi-

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276. CERCLA, 42 U.S.C. § 9607(a)(4)(C) (1988).

277. See, e.g., Thomson, *supra* note 172.

278. For trustees to arrive at an economic value for damages to natural resources, the regulations provide a number of valuation methods that trustees may use separately or in combination with other methods. See 59 Fed. Reg. 14,262, 14,264 (1994) (to be codified at 43 C.F.R. pt. 11).

279. See *Colorado v. United States Dep't of the Interior*, 880 F.2d 481, 490-91 (D.C. Cir. 1989); *Ohio*, 880 F.2d at 462-64; *supra* notes 205-11 and accompanying text.

280. 59 Fed. Reg. 14,262, 14,263 (1994) (to be codified at 43 C.F.R. pt. 11). There is no preference for restoration over acquisition of the equivalent resource. *Id.* at 14,275. When restoration or acquisition of the equivalent resource is "grossly disproportionate" to lost value, however, trustees are directed to select the less costly method between restoration and acquisition. *Id.* at 14,271. Indeed, pursuant to *Puerto Rico v. SS Zoe Colocotroni*, 628 F.2d 652 (1st Cir. 1980), natural recovery is allowable as a restoration method in limited circumstances, for reasons such as cost-

tion, the measure of damages includes the "compensable value" of the services lost to the public.<sup>281</sup> In other words, where natural resources will be restored, the DOI regulations translate into monetary terms the loss suffered by the public for nonuse during the time between the injury and full restoration of the natural resource in question.

The *Ohio* decision also rejected the 1987 rule's hierarchy of damage assessment methodologies, which limited recovery for lost natural resources to the price a resource would command on the open market. Realizing that some of the value of natural resources cannot be fully measured in marketplace terms, the court concluded that a presumption in favor of marketplace value and appraisal methodology would fall short of Congress's intent that the damage assessment regulations "capture fully all aspects of loss."<sup>282</sup> The court ordered the DOI to revise the rule to cover all reliably calculated lost values of injured natural resources, including both lost use values and lost nonuse values, with no specific hierarchy of methodologies for trustees to derive those values.<sup>283</sup> The use values are the more market-translatable values of a natural resource, encompassing both consumptive uses, such as hunting and fishing, in which resources are harvested, and nonconsumptive uses, such as hiking and bird watching, in which the activity does not reduce the stock or resources.<sup>284</sup> Nonuse values have the capacity to encompass a far greater field of people, as they "are not dependent on use of the resource."<sup>285</sup>

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effectiveness, cost-benefits, concern for additional injury, and the technical infeasibility of non-natural recovery. 59 Fed. Reg. 14,262, 14,271 (1994).

281. 59 Fed. Reg. 12,262, 14,264 (1994).

282. *Ohio*, 880 F.2d at 463; see also *id.*, at 462-63 ("From the bald eagle to the blue whale and snail darter, natural resources have values that are not fully captured by the market system.").

283. *Id.* at 464.

284. See generally 59 Fed. Reg. 14,262, 14,263-64 (1994) (to be codified at 43 C.F.R. pt. 11) (stating that a market-price methodology should be used to estimate lost use values).

285. 59 Fed. Reg. 14,262, 14,263 (1994) ("Nonuse values include existence value, which is the value of knowing that a resource exists, and bequest value, which is the value of knowing that a resource will be available for future generations."). The term "passive values" has also been used to refer to the same concept. See *Ohio*, 880 F.2d at 464; see also *Utah v. Kennecott Corp.*, 801 F. Supp. 553, 566 (C.D.

CVM, the only method currently available to estimate nonuse values, uses survey questionnaires to derive both use and non-use values of injured natural resources. The CVM constructs a hypothetical market to measure willingness to pay (WTP) and willingness to accept compensation for different levels of nonmarketed natural resources.<sup>286</sup> Neither the DOI nor the

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Utah 1992) (describing "bequest value" in a slightly more utilitarian way—as "option value . . . the value associated with an individual's desire to preserve the option to use the natural resource, even if it is not currently being used"), *cert. denied*, 115 S. Ct. 197 (1994).

Possibly confusing is the court's upholding in *Ohio* of the regulation's requirement that a trustee may only recover for NRD if those resources had a "committed use," *Ohio*, 880 F.2d at 462, which is defined as "either: a current public use; or a planned public use of a natural resource for which there is a documented legal, administrative, budgetary, or financial commitment established before the discharge of oil or release of a hazardous substance is detected," 43 C.F.R. § 11.14(h) (1994). This language apparently suggests that areas of undeveloped, "uncommitted" natural resources could only suffer very limited injury. The court in *Ohio*, however, determined that the "committed use" requirement is only relevant when trustees seek damages for conjectural categories of use. *See Ohio*, 880 F.2d at 462. In short, if recovery is sought only for funds to restore the resource, then the committed use definition does not apply. *See id.*

286. The method involves in-person or telephone interviews or a mail questionnaire. Elements common to CVM questionnaires include: (1) an explanation of the structure and rules of the market in which the good or service being valued is either bought or sold; (2) a description of the good or service and how it is to be provided; (3) the value elicitation question; and (4) validation questions, to verify comprehension and acceptance of the scenario and to elicit socioeconomic and attitudinal characteristics to interpret the reasonableness of variation in respondents' responses to the valuation question.

One of the variables in a CVM survey is the method in which a value is elicited from surveyed individuals for the resource in question. Value elicitation can be performed in three ways. First, there may be an open-ended WTP question format that simply asks the respondent to state his or her maximum WTP in dollars.

Another value elicitation procedure is the close-ended "iterative bidding" type question. Here the interviewer states an initial dollar amount and the respondent decides whether he or she would pay. If the respondent professes a WTP, the interviewer raises the amount until the respondent declines to pay. The highest dollar amount receiving a positive response is recorded as the person's maximum WTP. (If a negative response is received to the initial dollar amount, then the amounts are lowered until the interviewer receives a positive response.) In the interactive approach, poor selection of the starting value may influence the respondent's final reported value.

The approach favored by many economists is called dichotomous choice or "referendum." Under this approach, a respondent answers "yes" or "no" to one randomly assigned dollar amount chosen by the interviewer. For a general overview of CVM, see, for example, Richard T. Carson et al., *Contingent Valuation and Lost Passive*

National Oceanic and Atmospheric Administration (NOAA) regulations are able to set forth any universal rules on how each element of a CVM questionnaire should be designed, as appropriate formulations depend on the natural resource being valued and its context.<sup>287</sup>

## *2. The Response to Contingency Valuation: Carson's Moral Philosophy Meets the Law of Evidence*

Without doubt, Rachel Carson would support the law's recognition of nonuse value:

To the bird watcher, the suburbanite who derives joy from birds in his garden, the hunter, the fisherman or the explorer of wild regions, anything that destroys the wildlife of an area for even a single year has deprived him of pleasure to which he has a legitimate right. This is a valid point of view. Even if, as has sometimes happened, some of the birds and mammals and fishes are able to re-establish themselves after a single spraying [of pesticides], a great and real harm has been done.<sup>288</sup>

Carson is far from being a lone radical in this regard, as even the critics of CVM admit that survey results indicate a positive value for natural resources not used as human utilities.<sup>289</sup> Critics of CVM generally attack its imprecision and its lack of scientific validity, arguing that it falls far short of economic stan-

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*Use: Damages from the Exxon Valdez*, in *THE NEW RULES*, *supra* note 167, at 523; Carol A. Jones, *Contingent Valuation Method*, in *id.* at 581; John B. Loomis, *The Basics of Contingent Valuation Method*, in *id.* at 589.

287. As part of the process of writing regulations implementing the OPA, the NOAA convened the Contingent Valuation Panel, chaired by Nobel Laureate Professors Kenneth Arrow and Robert Solow, to evaluate CVM as a measure of nonuse values. The Panel issued a report setting forth requirements to achieve reliability in CVM. The four categories of requirements included in the proposed OPA rule are: (1) survey design requirements; (2) survey administration requirements; (3) internal validity checks on the nature of the results; and (4) complete reporting of survey instruments, data, and analysis, plus documentation of rationale for design choices. See 58 Fed. Reg. 4601 (1993).

288. CARSON, *supra* note 22, at 86-87.

289. See Jeffrey C. Dobbins, *The Pain and Suffering of Environmental Loss: Using Contingent Valuation to Estimate Nonuse Damages*, 43 DUKE L.J. 887, 908 (1994) (citing sources indicating that CVM surveys result in a positive nonuse value as well as a naysayer who admits the point).

dards for accurate surveying and thus fails to meet legal standards for admission of expert evidence.<sup>290</sup>

The legal argument rests on the well-established rule of admissibility of expert evidence that has its root in Federal Rule of Evidence 401, addressing relevancy. Expert evidence is relevant if it is based on "principles evolved by experience or science, applied logically to the situation at hand."<sup>291</sup> In addition, expert testimony must "assist the trier of fact to understand the evidence or to determine a fact at issue."<sup>292</sup> Arguably, CVM's heavy reliance on survey methodology renders the validity of its scientific basis questionable, and thus its potential for assisting the trier of fact is weakened by the danger of a fact finder relying more on survey results than is merited.

Adding to the potential for overreliance on CVM results by fact finders is Federal Rule of Evidence 703, which provides that if the data that an expert relies on in presenting an opinion are "of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject, the facts or data need not be admissible in evidence."<sup>293</sup> CVM critics support this hurdle to CVM survey admissibility with the Supreme Court's statement on admissibility of proffered scientific evidence set forth in *Daubert v. Merrell Dow Pharmaceuticals*:<sup>294</sup> "the trial judge must ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable."<sup>295</sup>

Arguments offered against the reliability of CVM focus on the difficulty individuals have in casting their amorphous concerns

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290. See, e.g., Thomson, *supra* note 172, at 610-17.

291. FED. R. EVID. 401 advisory committee's note.

292. FED. R. EVID. 702.

293. FED. R. EVID. 703.

294. 113 S. Ct. 2786 (1993).

295. *Id.* at 2795. *Daubert* replaced *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923), as the general rule for admissibility of scientific evidence. *Frye* required that before novel scientific methods or principles could be introduced into evidence, one must demonstrate that the method or principle has "gained general acceptance in the particular field in which it belongs." *Id.* at 1014. *Daubert* rejected the "general acceptance" test for scientific reliability, thus dealing a blow to those who would attack CVM for its relative newness. However, CVM critics may argue that *Daubert* replaced the "general acceptance" test with a heightened requirement that trial judges personally assess the reliability of offered scientific evidence.

for natural resources in a budgetary manner.<sup>296</sup> Further evidence of the inaccuracy of individual efforts to translate nonuse values into dollars is that individuals tend to place nearly identical values on greatly differing quantities of natural resource loss.<sup>297</sup> These flaws are amplified, CVM detractors argue, when one multiplies the error by the number of households that CVM conjectures have suffered the losses of those completing the surveys.<sup>298</sup> Finally, the fact that survey results may be radically altered due to simple changes in question phraseology is another vulnerability of CVM.<sup>299</sup>

Supporters of CVM, unlike its detractors, prefer to take the broader view, finding acceptable the legalistic flaws in this "best" method for deducing a dollar amount to stand for the intrinsic value of nature. In other words, to CVM supporters, CVM's evidentiary flaws are a far lesser evil than the law's continued ignorance of nonuse value.<sup>300</sup> CVM supporters do offer less broad brush support as well. They argue, for example, that CVM perpetrates no greater upset in evidentiary law than tort law's method (or lack thereof) for measuring pain and suffering damages.<sup>301</sup>

In spite of its numerous vulnerabilities, CVM has been utilized by courts to arrive at nonuse loss values.<sup>302</sup> For purposes of serving as a measure of the law's acceptance of Carson's philosophy, CVM's vulnerability to standard attacks under evidence law underscores its demonstration of the correctness of Carson's simplest and most abstract philosophical teachings.

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296. See Dobbins, *supra* note 289, at 924.

297. See Thomson, *supra* note 172, at 611 ("In other words, 2000 oily ducks are just as valuable as 200,000 oily ducks.") (citation omitted).

298. Dobbins, *supra* note 289, at 924.

299. *Id.* at 919-20 (discussing differences between questions asking for the dollar amount a surveyed person would be willing to pay to preserve a natural resource and questions asking for the dollar amount a surveyed person would be willing to accept as compensation for a lost natural resource).

300. See *id.* at 937.

301. *Id.*

302. See, e.g., *Utah v. Kennecott Corp.*, 801 F. Supp. 553 (D. Utah 1992), *cert. denied*, 115 S. Ct. 197 (1994). As one commentator notes, continued use of CVM will improve its methodology and help it better meet the evidentiary requirements. See Dobbins, *supra* note 289, at 933.



## V. CONCLUSION: PLATER'S PARADIGM REVISITED

*Have we fallen into a mesmerized state that makes us accept as inevitable that which is inferior or detrimental, as though having lost the will or the vision to demand that which is good? Such thinking, in the words of the ecologist Paul Shepard, "idealizes life with only its head out of water, inches above the limits of toleration of the corruption of its own environment . . . . Why should we tolerate a diet of weak poisons, a home in insipid surroundings, a circle of acquaintances who are not quite our enemies, the noise of motors with just enough relief to prevent insanity? Who would want to live in a world which is just not quite fatal?"*<sup>303</sup>

Reflecting on the above survey of Carson's writing, environmental law generally, and NRD law in particular, one may conclude that, in some ways, NRD law stands as the best our democratic system, legal structure, and technologically obsessed culture can achieve in keeping with Carson's philosophy. As a validation of Carson's philosophy, the theoretical potential of NRD nonuse valuation provides a symbol of true environmentalism in United States law and economics. In other ways, however, NRD law retreats from legal maneuverings that have represented progress toward the systemization of environmentalism in the past. Congress carefully hobbled the NRD claim with monetary caps, difficult proof requirements, and a retroactivity ban, the likes of which had been successfully combatted under other environmental programs.

On the one hand, such guarded validation of the NRD concept could ward off the type of backlash that diminished the environmental purity of the ESA.<sup>304</sup> On the other hand, the statutory controls over NRD could indicate that the law has simply spent its full potential for environmentalism in NRD law as that law stands today.

This Article began by discussing a paradigm developed by Professor Plater to describe Rachel Carson's environmentalist perspective. Plater's ultimate theory, for which he creates and

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303. CARSON, *supra* note 22, at 12.

304. *See supra* notes 119-24 and accompanying text.

utilizes his Paradigm, is that the integrity of environmentalist goals can be maintained only when environmentalists maintain an effective presence as outsiders—challengers to the developed system of environmental laws and politics.<sup>305</sup> In illustrating the strengths of environmental law, Plater focuses on the power underlying the citizen suit; indeed, Plater never mentions the strict liability structure of CERCLA as a significant achievement of environmentalism.

Carson writes to persuade in *Silent Spring*, issuing direct appeals to her readers' sense of will and rightness, but makes few references to law, politics, or economics in her examination of the earth's problems and her identification of solutions. By ignoring these major social systems that define societal behavior, Carson signals, perhaps inadvertently but perhaps not, the inadequacy of society's governing and motivational systems to further her goal of maintaining the balance of nature. Indeed, Carson's decidedly nonlegal perspective may be the key to her effectiveness as a symbol of environmental thinking.

To Carson, perhaps the most telling sign of the law's inability to truly embrace environmentalism is NRD law's use of the government trustee as a buffer between the polluter and the would-be private attorneys general, thus allowing administrative process to provide the framework and language for environmental protection in law. Like Plater, therefore, a Rachel Carson living in America today, with today's well-developed regime of environmental laws, might cast the true environmentalist as the outsider of mainstream law and politics. Perhaps, now that mainstream law and politics have attempted to assimilate environmental concerns, we should take from Rachel Carson the message that environmentalism must not content itself with the statutes and policies that attempt to systemize ecological concerns. Indeed, the most significant truth we who study the law

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305. Indeed, Plater's full thesis is that the Rachel Carson Paradigm works together with a second, more politically focused Pluralist Paradigm that emerged in the sixties and marks a shift in governance that allowed the public challenger to play a significant role countering economic and governmental motivators in decisions impacting the environment. Plater indicates that this shift toward pluralistic power division is key to the success of the environmental movement. See Plater, *supra* note 21, at 1004-08.

may bring from Carson's ecological perspective is that environmentalism is a concept that is historically and unalterably foreign to the United States' democratic political culture. True environmentalism, therefore, may only maintain its effectiveness and integrity by continuing to strain the capabilities of that political culture.

In *The Sea Around Us*, Rachel Carson observed that "[i]n the artificial world of his cities and towns, [man] often forgets the true nature of his planet and the long vistas of its history, in which the existence of the race of men has occupied a mere moment of time."<sup>306</sup> Similarly, environmentalists may forget the relative moment, the single generation since Carson's death, that modern environmental law has occupied in the history of law. If Carson were alive today, she might warn environmentalists not to rely too heavily on the durability of the environmental legal structure that has developed in this short time.

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306. CARSON, *supra* note 126, at 15.