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## REARRANGING THE DECK CHAIRS: ENDANGERED SPECIES ACT REFORMS IN AN ERA OF MASS EXTINCTION

PATRICK PARENTEAU\*

*And God said unto them, Be fruitful, and multiply and replenish the earth,  
and subdue it; and have dominion over the fish of the seas, and over every  
living thing that moveth upon the earth.*

Genesis 1:28

And indeed we have. It may not be the “end of nature,”<sup>1</sup> but nature sure ain’t what it used to be. Humans are not just part of the ecosystem, we dominate it. The evidence is all around us. Humanity expropriates forty percent of the “net primary production” (NPP) of the land on earth.<sup>2</sup> Between one-third and one-half of the land surface has been transformed by human action, and more than half of all accessible surface water is appropriated for human use.<sup>3</sup> The carbon dioxide concentration in the atmosphere has increased by thirty percent since the beginning of the Industrial Revolution,<sup>4</sup> and the planet is one degree (C) warmer.<sup>5</sup> Every

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\* Director, Environmental Law Center, Vermont Law School. I wish to thank the editors of the William & Mary Environmental Law and Policy Review for the good scrubbing they gave this article, and for their patience and good humor over the past many months.

<sup>1</sup> See, e.g., BILL MCKIBBEN, *THE END OF NATURE* (1989). McKibben was among the first to articulate for general audiences the profound effect of human actions upon the biosphere. McKibben’s lucid, often poignant, descriptions of the problems of acid rain, ozone depletion and global warming inspired some and angered others. By and large, however, his characterizations of the problems have been right on target; and, in particular his predictions about climate change, scoffed at by some, have been vindicated by the report of the Intergovernmental Panel on Climate Change (IPCC), signed by 2500 scientists, that led to the signing of the Kyoto Protocol in December, 1997, calling for reductions in greenhouse gases. See Jim Shama, *It’s Time to Act on Global Warming*, CHI. TRIB., Dec. 10, 1995, at 22; *Conference of the Parties to the Framework Convention on Climate Change: Kyoto Protocol*, 37 I.L.M. 22 (1998).

<sup>2</sup> See Peter Vitousek et al., *Human Appropriation of the Products of Photosynthesis*, 39 *BIOSCIENCE* 368, 373 (1986). NPP is the amount of solar energy captured in photosynthesis by primary producers, less the amount of energy used in their growth and reproduction. In short, NPP is the basic food source for everything on earth. See *id.* at 368.

<sup>3</sup> See Peter M. Vitousek et al., *Human Domination of Earth’s Ecosystems*, 277 *SCIENCE* 494, 494 (1997) [hereinafter Vitousek, *Human Domination*].

<sup>4</sup> See *id.* at 496.

<sup>5</sup> See WORLD METEOROLOGICAL ORGANIZATION/UNITED NATIONS ENVIRONMENT PRO-

spring, a hole the size of the North American continent opens in the ozone layer over the Southern Hemisphere, bathing the earth in ultra-violet radiation.<sup>6</sup> Populations of amphibians are in precipitous decline throughout the world, and scientists are not sure why, though habitat destruction, ultra-violet radiation, disease organisms, and chemical contaminants are the prime suspects.<sup>7</sup> Nearly a quarter of the ocean fisheries are severely depleted, and approximately forty-four percent of the ocean fisheries are at the limit of exploitation.<sup>8</sup> One-quarter of the bird species on earth have been driven to extinction.<sup>9</sup> And, in one of the more chilling mysteries, bizarre deformities and reproductive abnormalities are showing up in wildlife populations, from wading birds in the Great Lakes to alligators in the Everglades, which some scientists believe are linked to synthetic chemicals known as "endocrine disrupters."<sup>10</sup>

Concern over these conditions led fifteen hundred of the world's leading scientists to issue a "Warning To Humanity" in 1992.<sup>11</sup> In uncharacteristically blunt language, the scientists warned that "human beings and the natural world are on a collision course," and urged

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GRAMME, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE: THE IPCC SCIENTIFIC ASSESSMENT xi (J.T. Houghton et al., eds., 1990).

<sup>6</sup> See *CFC's and the Stratospheric Ozone Layer*, AMBIO, Oct. 1990 (special issue), at 19.

<sup>7</sup> See Alfred R. Blumstein & David B. Wake, *The Puzzle Of Disappearing Amphibian Populations*, SCI. AM., Apr. 1995, at 52. Because amphibians sample many parts of the environment, their health reflects the combined effects of many separate influences in their ecosystem. Also, because frogs and other amphibians remain in one location for most of their lives, they are an excellent gauge of local environmental conditions.

<sup>8</sup> See Vitousek, *Human Domination*, *supra* note 3, at 495.

<sup>9</sup> See *id.* at 498.

<sup>10</sup> See, e.g., THEO COLBORN ET AL., OUR STOLEN FUTURE: ARE WE THREATENING OUR FERTILITY, INTELLIGENCE, AND SURVIVAL?—A SCIENTIFIC DETECTIVE STORY (1996). Dr. Colborn argues that the evidence against synthetic chemicals containing dioxins, PCBs and other endocrine disrupters is sufficient to warrant that they be tested for hormonal effects in the same way they are currently tested for carcinogenic and mutagenic effects. See *id.* at 242. The theory of chemical endocrine disrupters is hotly disputed within the scientific community. See generally Richard Stone, *Environmental Estrogens Stir Debate*, 265 SCIENCE 308 (1994). Dr. Colborn has been compared to Rachel Carson whose warnings 30 years ago of pesticide contamination of the food chain also met with skepticism within the scientific establishment and outright hostility from the chemical industry. The lesson of history, in my view, is that Rachel Carson was right.

<sup>11</sup> See Union Of Concerned Scientists, *World's Scientists' Warning To Humanity* (1992), reprinted in PAUL R. EHRLICH & ANNE L. EHRLICH, BETRAYAL OF SCIENCE AND REASON: HOW ANTI-ENVIRONMENTAL RHETORIC THREATENS OUR FUTURE (1997) [hereinafter EHRLICH, BETRAYAL OF SCIENCE AND REASON].

“fundamental changes” lest the earth become “unable to sustain life in the manner we know it.”<sup>12</sup> Environmental kooks? Hardly: the list of signatories includes over 100 Nobel Laureates from many scientific fields.<sup>13</sup>

Something must be going on, and that something is at the heart of the current debate over the reauthorization of the Endangered Species Act (ESA),<sup>14</sup> and, more broadly, the fate of global biodiversity. This something is a human-orchestrated mass extinction of plants and animals; the “sixth extinction,” as it has been called.<sup>15</sup> And unless something dramatic is done about it, humanity threatens to turn the earth into a “planet of weeds.”<sup>16</sup>

This article attempts to describe the causes and consequences of this mass extinction phenomenon, and how the ESA seeks, bravely but inadequately, to cope with it. Part I provides a background on the “biodiversity crisis” and why it matters. Part II discusses the economic and political roots of the crisis. Part III explains how the ESA is supposed to work to prevent extinction and promote species recovery. Part IV briefly reviews what the ESA has, and has not, accomplished. Part V highlights the major criticisms of the ESA. Part VI discusses the administrative reforms implemented by the Clinton Administration to make the law more “user-friendly.” Part VII describes legislative proposals intended to make the ESA even friendlier through the reauthorization process. Finally, Part VIII offers a contrarian view of what

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<sup>12</sup> See *id.* at 242-50.

<sup>13</sup> See *id.* at 246-50.

<sup>14</sup> The Endangered Species Preservation Act of 1966, Pub. L. No. 89-669, §§ 1-3, 80 Stat. 926 (repealed 1973), was the first federal legislation on the subject of endangered species. See MICHAEL J. BEAN & MELANIE ROWLAND, *THE EVOLUTION OF NATIONAL WILDLIFE LAW* 194 (3d ed. 1997). It did little more than authorize land acquisition out of the Land and Water Conservation Fund. See *id.* The Endangered Species Conservation Act of 1969 expanded the program and authorized the Secretary of Interior to compile a list of “wildlife threatened with worldwide extinction,” and to prohibit trade in endangered species. See *id.* at 196 (quoting the Endangered Species Conservation Act of 1969, Pub. L. No. 91-135, 83 Stat. 275 (1969)).

<sup>15</sup> See, e.g., RICHARD LEAKEY & ROGER LEWIN, *THE SIXTH EXTINCTION: PATTERNS OF LIFE AND THE FUTURE OF HUMANKIND* 245 (1995) (“Dominant as no other species has been in the history of life on Earth, *Homo sapiens* is in the throes of causing a major biological crisis, a mass extinction, the sixth such event to have occurred in the past half billion years.”).

<sup>16</sup> See David Quammen, *Planet of Weeds: Tallying the Losses of Earth's Animals and Plants*, HARPER'S, Oct. 1998, at 57 [hereinafter Quammen, *Planet of Weeds*].

"real reform" might look like.

The premise of this article is that if the global extinction rate is to be slowed, the United States, as the wealthiest and most powerful nation on earth, must lead the way by strengthening both its domestic laws, particularly the ESA, and by expanding the reach of its foreign policy initiatives to actively foster biodiversity conservation around the world. Unfortunately, the political discourse on these issues is, at the moment, completely out of touch with the state of the science, and with more enlightened economic thinking about how to achieve prosperity without beggaring the planet. We desperately need—I hate to say it—a paradigm shift in our thinking if we are to create a world in which humans and nature are ever to live in "productive harmony."<sup>17</sup>

## I. BACKGROUND: THE BIODIVERSITY CRISIS AND WHY IT MATTERS

The global loss of biodiversity<sup>18</sup> is perhaps the most serious environmental issue of our time.<sup>19</sup> The extinction event now taking place

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<sup>17</sup> "Productive harmony" is the stated goal of the National Environmental Policy Act of 1969, 42 U.S.C. § 4231(a) (1994). Even though this goal seems unattainable, given the expected increases in global population, the industrialization of developing nations, rising levels of consumption, and the often unpredictable impacts of new technologies, all of which are pushing the limits of the earth's carrying capacity, it is nonetheless a worthwhile aspiration.

<sup>18</sup> The term biodiversity is relatively new, having first come to prominence at the National Forum on Biodiversity sponsored by the National Academy of Sciences and the Smithsonian Institution in 1986. See BIODIVERSITY II: UNDERSTANDING AND PROTECTING OUR BIOLOGICAL RESOURCES I (Marjorie L. Reaka-Kudla et al., eds., 1997) [hereinafter BIODIVERSITY II]. By the time of the 1992 Earth Summit in Rio, it had become one of the central issues of scientific and political concern world-wide. See *id.* The United Nations Convention on Biological Diversity, produced in Rio De Janeiro, defines biodiversity as "the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems." WALTER V. REID ET. AL, WORLD RESOURCES INSTITUTE, BIODIVERSITY PROSPECTING: USING GENETIC RESOURCES FOR SUSTAINABLE DEVELOPMENT Annex 4, Art. 2, 304-05 [hereinafter BIODIVERSITY PROSPECTING]. Many other definitions have been suggested by the biologists studying nature. See, e.g., DAVID TAKACS, THE IDEA OF BIODIVERSITY: PHILOSOPHIES OF PARADISE 43-52 (1996).

<sup>19</sup> In a recent Louis Harris poll, commissioned by the American Museum of Natural History, 70% of the members of the American Biological Society said the mass extinction of plants and animals now underway is the most serious environmental problem facing the world. See Joby Warrick, *Mass Extinction Underway, Majority of Biologists Say*, WASH. POST, Apr. 21, 1998, at A1 [hereinafter *Harris Poll*]. Edward O.

rivals the five great extinctions that have occurred in the earth's geologic history,<sup>20</sup> only this time it is humans, not asteroids,<sup>21</sup> that are the cause.<sup>22</sup> Extinction, of course, is part of evolution; in fact, over ninety-nine percent of all the species that ever lived are extinct.<sup>23</sup> But what concerns the scientists is the accelerating *rate* of extinctions humans are causing.<sup>24</sup> The problem is magnified by the fact that there are more species on earth now than ever before: so many, in fact, that scientists cannot say, even within an order of magnitude, just how many species there are.<sup>25</sup> Estimates range from 10 to 100 million,<sup>26</sup> with 5 to 15 million being the most commonly used range.<sup>27</sup> Plants and insects—"the little things that run the world," as Dr. Wilson puts it—make up the bulk of this diversity.<sup>28</sup> Tropical forests,

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Wilson has described it as "the one folly our descendants are least likely to forgive us." EDWARD O. WILSON, *The Conservation Ethic*, in *BIOPHILIA* 119, 121 (1996) [hereinafter WILSON, *BIOPHILIA*].

<sup>20</sup> See EDWARD O. WILSON, *THE DIVERSITY OF LIFE* 343 (1992) [hereinafter WILSON, *THE DIVERSITY OF LIFE*]; LEAKEY & LEWIN, *supra* note 15, at 241.

<sup>21</sup> See LEAKEY & LEWIN, *supra* note 15, at 52-55 ("Although the debate lingers on, the chances look strong that asteroid or comet impact either caused or contributed significantly to the [extinction of dinosaurs].").

<sup>22</sup> See WILSON, *THE DIVERSITY OF LIFE*, *supra* note 20, at 346; LEAKEY & LEWIN, *supra* note 15, at 241. See also Paul & Anne Ehrlich, *EXTINCTION: THE CAUSES AND CONSEQUENCES OF THE DISAPPEARANCE OF SPECIES* xiii (1981) [hereinafter EHRlich, *EXTINCTION*].

<sup>23</sup> See DAVID M. RAUP, *EXTINCTION: BAD GENES OR BAD LUCK?* 3, 4 (1991).

<sup>24</sup> See WILSON, *THE DIVERSITY OF LIFE*, *supra* note 20, at 280. Using "optimistic conclusion[s]," Wilson estimates that 27,000 species go extinct each year, 74 each day, 3 every hour. See *id.* This estimate has been challenged by some commentators as "pure guesswork." See, e.g., GREGG EASTERBROOK, *A MOMENT ON THE EARTH: THE COMING AGE OF ENVIRONMENTAL OPTIMISM* 556-62 (1995); Charles C. Mann, *Extinction: Are Ecologists Crying Wolf?*, 253 *SCIENCE* 736, 736-37 (1991). In turn, these lay critics have been challenged by scientists. See ERLICH, *BETRAYAL OF SCIENCE AND REASON*, *supra* note 11, at 13, 112-14. Although the precise number of extinctions may never be known, there is no dispute in the scientific community that, whatever the actual number, it is significant. See COMMITTEE ON SCIENTIFIC ISSUES IN THE ENDANGERED SPECIES ACT, NATIONAL RESEARCH COUNCIL, *SCIENCE AND THE ENDANGERED SPECIES ACT* 38-40 (1996) [hereinafter NRC REPORT]; *EXTINCTION RATES* 1-6, 10-21 (John H. Lawton & Robert M. May eds., 1995) [hereinafter *EXTINCTION RATES*].

<sup>25</sup> See William K. Stevens, *Lush Life: But as Species Vanish, What Will We Lose?*, N.Y. TIMES, June 2, 1998, at 1; WILSON, *THE DIVERSITY OF LIFE*, *supra* note 20, at 273.

<sup>26</sup> See LEAKEY & LEWIN, *supra* note 15, at 115.

<sup>27</sup> See BIODIVERSITY II, *supra* note 18, at 65.

<sup>28</sup> Edward O. Wilson, *The Little Things That Run The World*, 1 *CONSERVATION BIOLOGY* 344 (1987), reprinted in EDWARD O. WILSON, *IN SEARCH OF NATURE* 139 (1997) [hereinafter WILSON, *IN SEARCH OF NATURE*]. Dr. Wilson observes: "If the invertebrates

which occupy only six percent of the earth's land surface, are thought to contain half the world's biodiversity.<sup>29</sup> These forests are estimated to be disappearing at the rate of 100,000 acres per year, an area half the size of Florida.<sup>30</sup>

Our knowledge of this vast web of life is woefully inadequate. Scientists have been able to identify about 1.7 million species, but only a tiny fraction has been studied in any depth.<sup>31</sup> Although Dr. Wilson and others have called for a major world wide effort to inventory biological resources, to "map the ecosystem," little progress has been made.<sup>32</sup> Department of Interior Secretary Bruce Babbitt made a stab at it in 1992 when he proposed the creation of a National Biological Survey, modeled on the U. S. Geological Survey, which would begin to build a data base of the nation's biological resources that could be used to guide development and conservation efforts.<sup>33</sup> This fairly innocent-sounding idea met with a storm of protest from conservative Republicans in Congress, who saw it as a sneak attack on property rights, and it was quickly dropped in favor of a modest expansion of the existing Biological Services Division within the Fish and Wildlife Service.<sup>34</sup>

Meanwhile, the rate of human-caused extinction continues to accelerate. As Professor Dan Simberloff of the University of Tennessee has said, "[t]he speed at which species are being lost is much faster than anything we've seen in the past—including including those related to meteor collisions."<sup>35</sup> Whereas the natural or "background" rate of extinction is around three or four species per year, human activity may be

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were to disappear, it is unlikely that the human species could last more than a few months." *Id.* at 144.

<sup>29</sup> See *id.* at 195. See also Norman Myers, *Tropical Deforestation: The Latest Situation*, 4 BIOSCIENCE 282, 282 (1991).

<sup>30</sup> See WILSON, THE DIVERSITY OF LIFE, *supra* note 20, at 275.

<sup>31</sup> See *id.* at 312-19; UNITED NATIONS ENVIRONMENT PROGRAMME, GLOBAL BIODIVERSITY ASSESSMENT: SUMMARY FOR POLICY-MAKERS 1-4 (1995) [hereinafter GLOBAL BIODIVERSITY ASSESSMENT].

<sup>32</sup> See WILSON, THE DIVERSITY OF LIFE, *supra* note 20, at 314. Costa Rica has developed a prototype, the National Institute Of Biodiversity (Instituto Nacional de Biodiversidad), INBio for short. See *id.* at 314. The objective of INBio is to inventory all of the plants and animals, estimated at over 500,000, in this small Central American country. See *id.* at 314-15.

<sup>33</sup> See Bruce Babbitt, *The Endangered Species Act and "Takings": A Call For Innovation Within the Terms of the Act*, 24 ENVTL. L. 355, 356 (1994).

<sup>34</sup> See *id.* at 356-57, 366.

<sup>35</sup> Harris Poll, *supra* note 19, at A1.

wiping out that many *per hour* on a global basis.<sup>36</sup> At this rate, even assuming no increase, which is more than a little optimistic given growing population and development pressures around the world,<sup>37</sup> we stand to lose twenty percent of the earth's biodiversity by 2040,<sup>38</sup> and perhaps as much as two-thirds by the end of the 21st century.<sup>39</sup> And, since it takes about 25 million years for the process of evolution to replace these species, this loss is, for all practical purposes, irreversible.<sup>40</sup>

#### A. Causes

Habitat loss, especially in tropical forests and coral reef systems, is the principal cause of this mass extinction phenomenon.<sup>41</sup> Habitat values can be lost to fragmentation as well as to outright elimination. The impact of habitat fragmentation on species diversity was first described by Edward O. Wilson and Robert McArthur in a paper presented in 1963 titled *The Equilibrium Theory Of Island Biogeography*, later published in

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<sup>36</sup> WILSON, *THE DIVERSITY OF LIFE*, *supra* note 20, at 280. "The average life of a species in the fossil record is about four million years. Thus, only about one species in four million dies a natural death each year." See RAUP, *supra* note 23, at 108.

<sup>37</sup> By the year 2000 there will be approximately six billion people on earth. See JOEL E. COHEN, *HOW MANY PEOPLE CAN THE EARTH SUPPORT?* 138 tbl.8.2 (1995). The population is increasing by roughly 90 million people per year. See *id.* at 11. At that rate the global population will be 12 billion by 2050. See *id.* at 138 tbl.8.2. As a thought experiment, imagine all of them driving sport utility vehicles, consuming resources and generating waste at the level of the average American family, which is hundreds of times that of the poorest nations on earth. See generally ALAN THEIN DURNING, *HOW MUCH IS ENOUGH?: THE CONSUMER SOCIETY AND THE FUTURE OF THE EARTH* 19-36 (1992).

<sup>38</sup> See Quammen, *Planet of Weeds*, *supra* note 16, at 60.

<sup>39</sup> See *id.* at 61. Contributors to the growing body of literature in the field of conservation and evolutionary biology include Robert M. May, W. V. Reid, Stuart L. Pimm, Peter Raven, Stephen J. Gould, Anne and Paul Ehrlich, Norman Myers, Tom Lovejoy, Jared Diamond, Reed Noss, Dan Simberloff, Michael Soule, John Terborg, Jane Lubchenko, Ernst Meyer, Dan Janzen, and Tom Eisner.

<sup>40</sup> See WILSON, *IN SEARCH OF NATURE*, *supra* note 28, at 196.

<sup>41</sup> See NRC REPORT, *supra* note 24, at 35-38. A recent study by the World Resources Institute estimates that 60% of the world's coral reef systems are threatened by coastal development, pollution and overfishing. See *Coral Reefs at Risk, Study Says*, TAMPA TRIB., June 24, 1998, at 6. Coral reefs are second only to tropical rainforests in biological wealth. See Marjorie L. Reaka-Kudla, *The Global Biodiversity of Coral Reefs: A Comparison with Rain Forests*, in BIODIVERSITY II, *supra* note 18, at 83, 83-93. See also Andy P. Dobson et al., *Hopes For The Future: Restoration Ecology and Conservation Biology*, 277 SCIENCE 515, 515-18 (1997) (analyzing how habitat conversion has been a major threat to biodiversity).



the book *The Theory of Island Biogeography*.<sup>42</sup> Although the mathematical details are complicated and controversial, the essence of the theory is quite simple: the more habitat, the better for biodiversity.<sup>43</sup>

Introduction of exotics is also a major and growing threat to biodiversity.<sup>44</sup> Pollution and over-harvest are other factors.<sup>45</sup> Perhaps the greatest long term threat to ecosystem integrity is long term global climate change, or as the media likes to call it, "global warming."<sup>46</sup> Though there are still skeptics, especially in the fossil fuels business, on the talk show circuit, and in the Congress, there is now a strong scientific consensus that industrial emissions of "greenhouse gases," chiefly carbon dioxide, are causing the buildup of carbon in the atmosphere and creating a "greenhouse effect" with potential consequences for humans that range from merely awful to catastrophic.<sup>47</sup> Although the United States signed

<sup>42</sup> For a refreshingly humble account of the discovery of the theory, see Edward O. Wilson's autobiography, E.O. WILSON, *NATURALIST* 256, 319 (1997). The story is also told with flair in DAVID QUAMMEN, *THE SONG OF THE DODO: ISLAND BIOGEOGRAPHY IN AN AGE OF EXTINCTIONS* 416-31 (1996) [hereinafter QUAMMEN, *THE SONG OF THE DODO*].

<sup>43</sup> The formal name for this relationship is the species-area curve,  $S = C \cdot A^z$ , where  $S$  is the number of species,  $A$  is the area (occupied by the species), and  $C$  and  $z$  are the constants that vary from one group of organisms to another and from one location to another. See WILSON, *DIVERSITY OF LIFE*, *supra* note 20, at 276. This equation is used to predict the impact on species diversity from habitat fragmentation. See *id.* The rule of thumb is that when an area is reduced by 90% of its original size, the number of species eventually drops to one-half. See *id.* Distance between habitat patches is also important: closer is better, and the patches have to be connected so population groups can interact to foster genetic diversity. See *id.*

<sup>44</sup> See NRC REPORT, *supra* note 24, at 37. Hawaii provides a stark example of the devastating impact of exotics on endemic species. See *id.* at 38. Hawaii has the largest number of extinct and endangered species in the United States. More than one-half of the birds and mammals that now exist in Hawaii are introduced. See OFFICE OF TECHNOLOGY ASSESSMENT, *HARMFUL NON-INDIGENOUS SPECIES IN THE UNITED STATES* 13 (1993). See also ROBERT DEVINE, NATIONAL GEOGRAPHIC SOCIETY, *ALIEN INVASION: AMERICA'S BATTLE WITH NON-NATIVE ANIMALS AND PLANTS* (1998). By contrast, Alaska, which has the lowest number of exotics and the largest amount of relatively intact ecosystems (thanks to federally owned parks and wilderness) has the fewest number of endangered species.

<sup>45</sup> See NRC REPORT, *supra* note 24, at 35-37.

<sup>46</sup> ROBERT L. PETERS & THOMAS E. LOVEJOY, *GLOBAL WARMING AND BIOLOGICAL DIVERSITY* 3-14 (1992).

<sup>47</sup> See ROSS GELBSPAN, *THE HEAT IS ON* 135-53 (1998). For a rose-colored lens view of the issues, see THOMAS GALE MOORE, CATO INSTITUTE, *CLIMATE OF FEAR: WHY WE SHOULDN'T WORRY ABOUT GLOBAL WARMING* 10-13 (1998).

the Kyoto Protocol in December, 1997, pledging a reduction in greenhouse gases to 1990 levels, the agreement must be ratified by the Senate where it currently faces stiff opposition.<sup>48</sup> The Clinton Administration seems in no hurry to present the protocol to Congress until it secures additional commitments for emission caps, through "side agreements," with industrializing nations such as China and India, who will become the major contributors of greenhouse gases in the next century.

While habitat loss and species extinction in the non-industrialized countries of the world, where so much biodiversity still exists, pose the greatest threat to global biodiversity, there are serious problems right here in the United States, and Americans are hardly in a position to criticize developing nations for doing what we have already done. Since the arrival of the Europeans to the North American continent, over 500 species, subspecies, and races of plants and animals have become extinct in the United States.<sup>49</sup> Entire ecosystems, including once vast expanses of prairies, savannahs, and virgin forests have virtually disappeared, replaced by intensive agriculture, industrial forestry, and urban sprawl.<sup>50</sup> We have drained and filled over half of the nation's wetlands.<sup>51</sup> We have polluted and disrupted the ecological functioning of our most productive systems: estuaries and coastal waters. For example, the Florida Everglades have been so degraded that the Army Corps of Engineers has proposed "the largest and most complex ecological restoration ever," with an estimated price tag of \$7.5 billion.<sup>52</sup> Chesapeake Bay, another severely degraded

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<sup>48</sup> See Christopher Flavin, *Last Tango in Buenos Aires*, 11 *WORLDWATCH* 10 (1998).

<sup>49</sup> See COUNCIL ON ENVIRONMENTAL QUALITY, *ENVIRONMENTAL QUALITY: THE TWENTY-FIRST ANNUAL REPORT OF THE COUNCIL ON ENVIRONMENTAL QUALITY TOGETHER WITH THE PRESIDENT'S MESSAGE TO CONGRESS* 136 (1990).

<sup>50</sup> See REED F. NOSS & ROBERT L. PETERS, *DEFENDERS OF WILDLIFE, ENDANGERED ECOSYSTEMS: A STATUS REPORT ON AMERICA'S VANISHING HABITAT AND WILDLIFE* app., at 54-68 (1995). The authors identify 21 ecosystems as "most-endangered." See *id.* at 54. They include regional systems such as the tallgrass prairie of the Midwest and Great Plains and the old growth forests of the Pacific Northwest, which have lost over 90% of their original acreage, as well as systems in trouble on a national scale, such as cave and karst systems and large streams and rivers. See *id.* at 61-66.

<sup>51</sup> See OFFICE OF TECHNOLOGY ASSESSMENT, *WETLANDS: THEIR USE AND REGULATION*, 87, 90-91 (1984) [hereinafter *OTA WETLANDS REPORT*].

<sup>52</sup> See Robert P. King, *\$7.5 Billion Water-Supply Overhaul Touted*, *PALM BEACH POST*, June 6, 1998, at A1. See also Stephen S. Light & J. Walter Dineen, *Water Control in the Everglades: A Historical Perspective*, in *THE EVERGLADES: THE ECOSYSTEM AND ITS RESTORATION* 47, 81-82 (Steven M. Davis & John C. Ogden eds. 1997) [hereinafter *THE*

estuary, now hosts a nasty, flesh-eating microbe (*pfiesteria piscicida*), dubbed the "cell from hell," that seems to thrive on the contaminated runoff coming from large poultry and hog factory farms springing up throughout the basin.<sup>53</sup> Having wiped out the wild Atlantic salmon (except for a relict population in a few coastal streams in Maine),<sup>54</sup> we are in the process of doing the same to the Pacific salmon.<sup>55</sup> Plants are also in serious trouble: according to a recent report of the World Conservation Union, one in eight plant species are endangered worldwide; in the United States, the ratio is one in three.<sup>56</sup>

### B. Consequences

The consequences of this loss of biodiversity are not always readily apparent, but they are real and serious. The consequences can be reckoned in at least two ways: from an anthropocentric perspective exclusively concerned with human desires; and from a biocentric perspective that considers the intrinsic worth of all life on earth.<sup>57</sup> Either

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EVERGLADES] ("The challenge now faced is nothing short of reconfiguring the structural works of the Central and Southern Florida Project to repair the Everglades, while providing for the human needs of the region."); COMMITTEE ON RESTORATION OF AQUATIC ECOSYSTEMS: SCIENCE, TECHNOLOGY, AND PUBLIC POLICY, NATIONAL RESEARCH COUNCIL, RESTORATION OF AQUATIC ECOSYSTEMS: SCIENCE, TECHNOLOGY AND PUBLIC POLICY 287 (1992) (stating that Congress has allocated money for the Army Corps of Engineers to undo "the channelization of the river that [the Corps] completed 20 years ago.").

<sup>53</sup> For the latest on the constantly evolving story of the *pfiesteria* outbreak, visit the University Of Maryland's website at <<http://www.mdsg.edu.80/fish-health/pfiesteria>>. See also Elaine Butschen, *Pfiesteria piscicida: A Regional Symptom of a National Problem*, 28 ENVTL. L. REP. 10317 (1998). The National Atmospheric and Oceanic Administration estimates that the *pfiesteria* outbreaks have caused over \$1 billion in damage to U.S. fisheries. See *id.* at 10351. The organism may also be harmful to humans, causing learning and memory loss. See *id.*

<sup>54</sup> See Proposed Rules on Petition to List the Atlantic Salmon in the United States as Endangered or Threatened, 60 Fed. Reg. 14,410, 14,411 (Mar. 17, 1995).

<sup>55</sup> See Oliver A. Houck, *On the Law of Biodiversity*, 81 MINN. L. REV. 869, 931-37 (1997); *Salmon Recovery Pacific Salmon Fisheries Issues: Hearings Before the Subcommittee on Drinking Water, Fisheries and Wildlife of the Senate Committee on Environment and Public Works*, 104th Cong. 23 (1996) (testimony of Richard Williams).

<sup>56</sup> See William K. Stevens, *One in Every 8 Plant Species is Imperiled, a Survey Finds*, N.Y. TIMES, Apr. 9, 1998, at A1.

<sup>57</sup> See, e.g., HERMAN E. DALY & JOHN B. COBB, JR., FOR THE COMMON GOOD: REDIRECTING THE ECONOMY TOWARD COMMUNITY, THE ENVIRONMENT, AND A SUSTAINABLE FUTURE 107 (1994); JEFFREY MCNEELY, ECONOMICS AND BIOLOGICAL

approach reveals the significant value of biodiversity, and the high opportunity costs that attend its demise.<sup>58</sup>

Humans derive both direct and indirect benefits from biological resources. Direct benefits include medicine, food, shelter, and clothing. For example, in the United States, forty percent of health care prescriptions come from natural organisms (plants, animals and microorganisms).<sup>59</sup> Biodiversity supplies much of the protein and nutrition for humans, as well as the wild seeds used to hybridize crops in the race to stay one step ahead of chemical-resistant pests.<sup>60</sup> Recreation and eco-tourism, often enhanced by the presence of "charismatic megafauna," such as the wolf, the eagle and the grizzly bear, also generate significant economic value.<sup>61</sup>

The indirect benefits of biodiversity are even more compelling. These include so-called ecosystem services such as air and water quality maintenance, climate regulation, nutrient cycling, waste treatment, soil formation, pollination, flood control, and water supply.<sup>62</sup> For example, wetlands act as sponges and buffers, soaking up floods and dissipating storms; they also function as kidneys, filtering pollutants and helping to maintain water quality in rivers and lakes; and they are the nurseries that

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DIVERSITY: DEVELOPING AND USING ECONOMIC INCENTIVES TO CONSERVE BIOLOGICAL RESOURCES 53 (1988) (providing guidelines for and discussing the economic incentives and disincentives of promoting the conservation of biological diversity).

<sup>58</sup> See MCNEELY, *supra* note 57, at 10-13.

<sup>59</sup> In 1993, 80% of the 150 top prescription drugs used in the United States were either natural products or synthetics derived from natural products. See GLOBAL BIODIVERSITY ASSESSMENT, *supra* note 31, at 14.

<sup>60</sup> See David Pimentel et al., *Benefits and Costs of Pesticide Use in the U.S. Food Production*, 28 BIOSCIENCE 772, 781-84 (1978); Robert M. May, *Evolution of Pesticide Resistance*, 315 NATURE 12, 12 (1985) (commenting that despite a twofold increase in the use of pesticides, the proportion of US crops lost to pests has doubled since 1940).

<sup>61</sup> The World Bank estimates that eco-tourism generates \$2 trillion annually. See GLOBAL BIODIVERSITY ASSESSMENT, *supra* note 31, at 16. To cite one small example closer to home, the reintroduction of the gray wolf to Yellowstone National Park, which opponents argued would be the ruination of the local ranching economy is expected to generate net revenues (after taking livestock degradation into account) of \$10 million per year by 2000. See U.S. FISH AND WILDLIFE SERV., DRAFT ENVIRONMENTAL IMPACT STATEMENT ON THE REINTRODUCTION OF GRAY WOLVES TO YELLOWSTONE NATIONAL PARK AND CENTRAL IDAHO 18-19 (1993). The reintroduction is certainly popular with the touring public: the Park Service reports that visitors to Yellowstone increased by five to ten percent after the wolves were set free. See *id.* at 18.

<sup>62</sup> See *Introduction: What are Ecosystem Services?*, in NATURE'S SERVICES: SOCIETAL DEPENDENCE ON NATURAL ECOSYSTEMS (Gretchen C. Daily ed., 1997) [hereinafter NATURE'S SERVICES].

support the nation's commercial and recreational fisheries.<sup>63</sup> The destruction of wetlands throughout the Mississippi River Basin was a major contributing factor to the devastating 1993 floods.<sup>64</sup> Likewise, wetland loss in major estuaries such as the Chesapeake Bay reduces their assimilative capacity, accelerating eutrophication and causing other water quality problems.<sup>65</sup>

Pollination is another critical ecosystem service. Approximately ninety percent of the world's food supply depends on a little over 100 species of plants.<sup>66</sup> An important question, therefore, is whether pollination is a limiting factor in the productivity of these species. In a landmark field experiment conducted in 1993, scientists found that forty-six percent of a representative sample of 186 species were "pollinator-limited," meaning that pollination was more important than all the other factors that affect plant growth, including weather and soil fertility.<sup>67</sup> Assuming it accurately reflects natural conditions, the implications of this finding are profound; it means that almost half of the world's food supply may depend on wild pollinators, lending credence to Dr. Wilson's thesis that "little things" may indeed "run the world."<sup>68</sup>

Although putting a dollar value on these natural services is difficult, economists have begun to try. In a path-breaking study in 1996, a team of scientists and ecological economists, headed by Robert Costanza of the University of Maryland, estimated the value of seventeen ecosystem services for sixteen biomes<sup>69</sup> to be in the range of \$16 to 54 trillion.<sup>70</sup> At

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<sup>63</sup> See OTA WETLANDS REPORT, *supra* note 51, at 43-61.

<sup>64</sup> See generally ANN ROBINSON & ROBBIN MARKS, RESTORING THE BIG RIVER: A CLEAN WATER ACT BLUEPRINT FOR THE MISSISSIPPI 41 (1994) (explaining how wetland loss in the Upper Mississippi River has removed an estimated 26.6 million acre-feet of flood storage capacity).

<sup>65</sup> See, e.g., Susan Pollack, *Holding the World at Bay*, SIERRA, May/June, 1996, at 50, 52 (describing the decline of the Chesapeake Bay as the result of increased human activity).

<sup>66</sup> See Robert Prescott-Allen & Christine Prescott-Allen, *How Many Plants Feed the World?*, in 4 CONSERVATION BIOLOGY 365, 367-71 (1990).

<sup>67</sup> Gary Paul Nabhan & Stephen L. Buchman, *Services Provided by Pollinators*, in NATURE'S SERVICES, *supra* note 62, at 133, 137.

<sup>68</sup> See generally STEPHEN L. BUCHMANN & GARY PAUL NABHAN, THE FORGOTTEN POLLINATORS 185-201 (1996) (citing the example of the honey bee, the most important commercial pollinator, which has declined dramatically in the past 50 years, coinciding with the widespread application of agricultural pesticides).

<sup>69</sup> A biome is a "major category of habitat in a particular region of the world, such as the tundra of northern Canada or the rain forest of the Amazon basin." WILSON, DIVERSITY OF LIFE, *supra* note 20, at 393.

<sup>70</sup> See Robert Costanza et al., *The Value of the World's Ecosystem Services and Natural*

an average of \$33 trillion per year, this represents almost twice the total gross national product of all the nations of the world combined.<sup>71</sup> Further, according to the authors, these are conservative estimates that probably understate the true value.<sup>72</sup> The authors also acknowledge that some ecosystem functions are irreplaceable, and some values are priceless.<sup>73</sup>

These numbers are admittedly “soft,” though perhaps no more so than the benefit calculations used to justify federal water resource projects and National Forest timber sales.<sup>74</sup> In any case they are better than nothing, and nothing is the value typically assigned to ecosystems by conventional economic analysis.<sup>75</sup> In point of fact, the Costanza study did use conventional valuation techniques, such as “avoided cost,”<sup>76</sup> whenever they were available, and used more “cutting-edge” techniques like contingent valuation (i.e., “willingness to pay”) where they were not.<sup>77</sup>

Many conservationists object in principle to accepting economic theories as a legitimate basis to decide the fate of species.<sup>78</sup> I tend to agree that wholesale adoption of economic measures to justify biodiversity preservation would be misguided and myopic. On the other hand, in a political world where money talks,<sup>79</sup> and the rules of the game are largely

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*Capital*, 387 NATURE 253, 259 (1997).

<sup>71</sup> See *id.*

<sup>72</sup> See *id.*

<sup>73</sup> See *id.* at 258.

<sup>74</sup> For a discussion of the phony economics used to justify federal water projects, see MARC REISNER, *CADILLAC DESERT* (1986). For an economist's critique of “below cost” federal timber sales, see RANDALL O'TOOLE, *REFORMING THE FOREST SERVICE* (1982).

<sup>75</sup> See *id.* at 257. See also THOMAS PRUGH ET AL., *NATURAL CAPITAL AND HUMAN ECONOMIC SURVIVAL* 91 (1995) (“[T]he wear and tear on forests, soil, air and water caused by their exploitation is not subtracted from their value.”); MCNEELY, *supra* note 57, at 2.

<sup>76</sup> An example of an avoided cost is flood damage that could have been prevented if wetlands had not been destroyed. See generally OTA WETLANDS REPORT, *supra* note 51, at 43-46 (explaining the role of wetlands in flood peak reduction).

<sup>77</sup> See generally Paul R. Portney, *The Contingent Valuation Debate: Why Economists Should Care*, J. ECON. PERSP., Fall 1994, at 3; W. Michael Hanneman, *Valuing The Environment Through Contingent Valuation*, J. ECON. PERSP., Fall 1994, at 19; Brian R. Binger et al., *The Use of Contingent Valuation Methodology in Natural Resource Damage Assessments: Legal Fact and Economic Fiction*, 89 NW. U. L. REV. 1029 (1995).

<sup>78</sup> See DAVID EHRENFELD, *THE ARROGANCE OF HUMANISM* 177 (1981).

<sup>79</sup> According to a report of the U.S. Public Interest Research Group, political action committees contributed more than \$100 million to candidates sponsoring legislation to weaken the ESA. See *The Price of Extinction: Chapter II: Anti-Wildlife PAC Contributions*, at <<http://www.PIRG.org/enviro/esa/pac98/page4.html>>. Top recipients

economic, advocates of biodiversity cannot afford not to learn how to play the game, if only to counter artificial economic arguments.

Having said that, there is a far more important reason than their potential monetary value to be concerned about the well-being of other species, and that has to do with our own well-being. One does not have to be a deep ecologist, nor subscribe to Armageddon theories, to understand that the disappearance of so many of the living organisms with whom we share the biosphere could have serious implications for *homo sapiens*. It may be, as some economists have argued, that there are no physical limits to the ability of the human population to grow, to consume, and to pollute; and even if there are limits, there may be plenty of time for technology to find substitute resources, or perhaps even a substitute planet.<sup>80</sup> But then again, maybe not. Maybe that belief places too much faith in the wisdom of the market and the wonder of technology. Maybe there is something to this ecological notion of carrying capacity.<sup>81</sup> Or maybe the vision of a planet dominated by "weed species" rats, cockroaches and pigeons—the only ones with the capability to adapt to human-dominated conditions—does not hold much appeal.<sup>82</sup> In any case, I would not "bet the company" on the ability of the market and technology to avoid overshooting the limits.<sup>83</sup>

I submit that endangered species actually provide a more tangible, reliable index of carrying capacity limits than the market, even with improved pricing mechanisms, will ever be able to provide. Endangered species truly are, as so often described, miner's canaries, or nature's sentinels, warning us of dangers seen and unseen. The bald eagle warned us about poisoning the food chain with chemical pesticides,<sup>84</sup> the snail

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were Representative Don Young (R-Alaska), Chair of the House Resources Committee (\$471,053 over nine years), and Senator Larry Craig (R-Idaho) (\$525,659 over nine years). *See id.*

<sup>80</sup> *See* JULIAN SIMON, *THE ULTIMATE RESOURCE* (1981). *But cf.* Herman E. Daly, *Review of THE ULTIMATE RESOURCE*, in *STEADY-STATE ECONOMICS* 262 (2d ed. 1991) (responding to Dr. Simon's theory that economic growth is not limited by finite resources).

<sup>81</sup> *See* HERMAN E. DALY, *BEYOND GROWTH: THE ECONOMICS OF SUSTAINABLE DEVELOPMENT* 121 (1996) [hereinafter DALY, *BEYOND GROWTH*].

<sup>82</sup> *See* Quammen, *Planet of Weeds*, *supra* note 16, at 62.

<sup>83</sup> *See* DONELLA H. MEADOWS ET AL., *BEYOND THE LIMITS: CONFRONTING GLOBAL COLLAPSE, ENVISIONING A SUSTAINABLE FUTURE* 184 (1992). The authors conclude: "The market is blind to the long term and pays no attention to ultimate sources and sinks, until they are nearly exhausted, when it is too late to act." *Id.*

<sup>84</sup> *See* ERLICH, *EXTINCTION*, *supra* note 22, at 146.

darters warned us that boondoggle water projects were claiming far too many free-flowing rivers and valley farms;<sup>85</sup> the northern spotted owl warned us that liquidation of the old growth forest also meant damage to salmon fisheries, water supplies, and unique "quality of life" assets;<sup>86</sup> the Barton springs salamander warned us that over-pumping the Edwards aquifer threatened the agricultural communities of West Texas that also depended on adequate water levels;<sup>87</sup> the Alabama beach mouse warned us that the coastal barrier dunes system was falling apart.<sup>88</sup> And so on. Every species tells a story about resource depletion and degradation, about waste and abuse, about unsustainable uses of the land. Look behind every community of endangered plants and animals and you will find a human community threatened by the same process of environmental degradation and ecosystem decay. The loggers in the Pacific Northwest who protested that they were the real endangered species in the spotted owl controversy<sup>89</sup> did not realize just how right they were. For as soon as the last old growth tree was down, and the last lumber truck rumbled through town, their jobs would also be gone, along with the timber companies who were off to liquidate the next forest in the Northeast, the Southeast, Canada, Malaysia

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<sup>85</sup> After countless stories of "the little fish vs. the big dam," the economic fallacy of the Tellico Project was finally exposed (like "old lovers and bad checks" in the words of my colleague Professor Oliver Houck of Tulane Law School) when the Endangered Species Exemption Committee (the "God Squad"), which was created to review the project, voted 7-0 to deny an exemption. I was present at the hearing where Committee member Charles Shultz, then Chair of the Council On Economic Advisers to President Jimmy Carter, said: "Here is a project that is 95% complete and if one takes just the cost of finishing it against total project benefits, and does it properly, it doesn't pay." Unfortunately, that did not stop Congress from exempting the project from the ESA, and closing the gates on Tellico. See PLATER ET AL., ENVIRONMENTAL LAW AND POLICY: NATURE, LAW, AND SOCIETY 670 (1992). Small populations of snail darters were subsequently discovered in tributaries of the Little Tennessee River, and the Department of Interior has downlisted the darter to "threatened" status. See *id.* at 671.

<sup>86</sup> See STEVEN LEWIS YAFFEE, THE WISDOM OF THE SPOTTED OWL: POLICY LESSONS FOR A NEW CENTURY 126 (1994).

<sup>87</sup> See *Sierra Club v. Lujan*, No. MO-91-CA-069, 1993 WL 151353, at \*6 (W.D. Tex. Feb. 1, 1993).

<sup>88</sup> See *Sierra Club v. Babbitt*, No. Civ.A. 97-0691-CB-C, 1998 WL 481452, at \*3 (S.D. Ala. Aug. 4, 1998) (the beach mouse performs an important ecological function by distributing the seeds of the beach grasses that anchor the dune system).

<sup>89</sup> See generally YAFFEE, *supra* note 86, at 115-23 (discussing the contention between timber interests and preservationists over the listing of the spotted owl as a threatened species under the Endangered Species Act).



or wherever.<sup>90</sup>

But what about species that seem to have no known economic or practical value to humans. Does it make sense to try to "save every species, no matter what the cost?"<sup>91</sup> The authors of *Noah's Choice*, a book that came out when forces were mobilizing in Congress to revamp the ESA, argue that such an objective is foolhardy and counterproductive.<sup>92</sup> They suggest that a panel of experts be appointed to decide which species we should "take with us," and which ones to let go.<sup>93</sup> But how would such a panel, no matter how wise or pure, go about making such god-like decisions? Certainly not on the basis of available scientific evidence. We simply do not know enough about most species to make judgments about their ecological function, let alone their potential utility to humans. Many seemingly obscure species turn out to play a keystone role in the healthy functioning of ecosystems.<sup>94</sup> As a precautionary matter, because we can never know what species might become valuable to us, it seems prudent to seek to conserve as many as possible.<sup>95</sup> In the words of Aldo Leopold, "[t]he last word in ignorance is the man who says of an animal or plant: 'What good is it?' . . . To keep every cog and wheel is the first precaution of intelligent tinkering."<sup>96</sup>

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<sup>90</sup> See ROCKY BARKER, SAVING ALL THE PARTS: RECONCILING ECONOMICS AND THE ENDANGERED SPECIES ACT 110-11, 217-19 (1993); WILLIAM DIETRICH, THE FINAL FOREST 188 (1992); KEITH ERVIN, FRAGILE MAJESTY: THE BATTLE FOR NORTH AMERICA'S LAST GREAT FOREST 107 (1989). Each of these authors chronicles, from different perspectives, how the liquidation of the old growth forest would inevitably lead to a collapse of the economy on which it was built, just as surely as an oil field eventually dries up, or a mineral vein plays out.

<sup>91</sup> CHARLES C. MANN & MARK L. PLUMMER, NOAH'S CHOICE: THE FUTURE OF ENDANGERED SPECIES 215 (1996).

<sup>92</sup> See *id.*

<sup>93</sup> See *id.* at 229.

<sup>94</sup> A keystone species is one that "affects the survival and abundance of many other species in the community in which it lives." WILSON, DIVERSITY OF LIFE, *supra* note 20, at 401. A good example of a keystone species is the sea otter, which once thrived among the kelp forests in the near-shore waters from Alaska to Southern California. See *id.* at 164. But by the end of the 19th century it had been hunted to near extinction. See *id.* Where it vanished, the population of sea urchins, its principal prey, exploded and decimated the kelp forests, which supported a rich community of life including squid, fish and the endangered gray whale. See *id.* Through a major, privately-funded reintroduction effort, the sea otter was reintroduced, the urchin population declined, the kelp returned, and the system was restored. See *id.* at 164-65.

<sup>95</sup> See *id.* at 351.

<sup>96</sup> ALDO LEOPOLD, A SAND COUNTY ALMANAC WITH OTHER ESSAYS ON CONSERVATION

Consider the humble Pacific yew, once burned as a trash species in the old growth forests of the Northwest, later discovered to be the source of the cancer-fighting drug taxol, and now a \$1.3 billion a year product for the Bristol-Meyers Squibb Company.<sup>97</sup> Or the rosy periwinkle, a nondescript little pink-petaled plant in the tropical forests of Madagascar found to contain two alkaloids, vincristine and vinblastine, proven to be effective in the treatment of Hodgkin's disease and lymphocytic leukemia, two forms of childhood cancer.<sup>98</sup> Aspirin, the most widely taken medicine in the world, comes from the bark of the willow; digitalis, the heart medicine, comes from foxglove; a popular drug for hypertension comes from the venom of a South American pit viper.<sup>99</sup> And so on. The natural world is indeed a vast storehouse of potentially beneficial products.<sup>100</sup>

### C. *The Biocentric View*

Still, it would be a mistake to attempt to rest the case for species preservation purely on economic arguments.<sup>101</sup> Even if market prices fully reflected the value of a species, it would still be efficient, from a conventional economic standpoint, to exploit a species to extinction or totally degrade an ecosystem if the value of the species or the ecosystem over time is not increasing as fast as money deposited in an interest-bearing bank account.<sup>102</sup> Small wonder economics is sometimes called the dismal science. There is, however, another way to look at the issue: from the perspective of nature itself.

The so-called biocentric view of the world springs from many sources, starting with the cosmology of the indigenous peoples of the world. For example, the great Mayan text *Popol Vuh* tells the story of the Wooden People, whom the gods created to be the "nurturers" of the

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FROM ROUND RIVER 177 (3d prtg. 1971) [hereinafter A SAND COUNTY ALMANAC].

<sup>97</sup> See William Barrett, *Delaying Tactics*, FORBES, Mar. 1998, at 68.

<sup>98</sup> See WILSON, DIVERSITY OF LIFE, *supra* note 20, at 283.

<sup>99</sup> See NORMAN MYERS, A WEALTH OF WILD SPECIES: STOREHOUSE FOR HUMAN WELFARE 119 (1983).

<sup>100</sup> See *id.* See also NATURE'S SERVICES, *supra* note 62, at 255-70.

<sup>101</sup> See EHRENFELD, *supra* note 78, at 177 (1981).

<sup>102</sup> See ENVIRONMENTAL ECONOMICS: AN ELEMENTARY INTRODUCTION 72 (R. Kerry Turner et al. eds., 1993). See also David Ehrenfeld, *The Conservation Of Non-Resources*, 64 AM. SCIENTIST 648, 653 (stating "any competing use with a higher value, no matter how slight the differential, would be entitled to priority in the use of" natural resources not assigned monetary value).

natural world.<sup>103</sup> But the Wooden People became too clever for their own good, and began abusing the land and the animals.<sup>104</sup> So the gods decided the Wooden People would have to be eliminated.<sup>105</sup> To accomplish this, the gods "empowered nature to retaliate against humankind,"<sup>106</sup> the sun and wind, the thunderstorms and volcanoes, the jaguars and all living things turned on the Wooden People and destroyed them.<sup>107</sup> Perhaps this is where the expression, "It's not nice to fool Mother Nature" comes from. Similar creation stories are found in many Native American cultures.<sup>108</sup>

Many Eastern and Western religions hold all life sacred, and reject any human right to consciously extirpate species for economic gain.<sup>109</sup> Religion is playing a more active role in environmental politics in general and endangered species preservation in particular.<sup>110</sup> In 1992, for example, a group of religious leaders delivered a "Joint Appeal by Religion and Science for the Environment" to Congress, calling upon it to strengthen environmental laws such as the ESA.<sup>111</sup>

Ethical arguments on behalf of biodiversity are often grounded on the concept of intergenerational equity, the duty that each generation is said to owe succeeding generations.<sup>112</sup> The Iroquois Confederacy, which served as the model for American democracy, expressed this ethic in the principle that every decision made by a community ought to consider how it would affect the seventh generation hence.<sup>113</sup> This same ethic can be

<sup>103</sup> See generally DAVID SUZUKI & PETER KNUDTSON, WISDOM OF THE ELDERS: HONORING SACRED NATIVE VISIONS OF NATURE 245-47 (1992) (recounting the story of the Wooden People from the Mayan Text, *Popol Vuh*).

<sup>104</sup> See *id.*

<sup>105</sup> See *id.*

<sup>106</sup> *Id.* at 246.

<sup>107</sup> See *id.* at 246-47.

<sup>108</sup> See *id.* at 248; GERALD HAUSMAN, TUNKASHILA: FROM THE BIRTH OF TURTLE ISLAND TO THE BLOOD OF WOUNDED KNEE 5-22 (1993).

<sup>109</sup> See PETER MARSHALL, NATURE'S WEB: RETHINKING OUR PLACE ON EARTH 9-137 (1992) (discussing Taoism, Hinduism, Buddhism, Judaeo-Christianity, Islamic, and Native American beliefs).

<sup>110</sup> See WILSON, IN SEARCH OF NATURE, *supra* note 28, at 192. See also RODERICK FRAZIER NASH, THE RIGHTS OF NATURE: A HISTORY OF ENVIRONMENTAL ETHICS 87-120 (1989).

<sup>111</sup> See Laura Sessions Stepp, *Denominations Find Common Ground in Saving the Earth*, WASH. POST., May 23, 1992, at D12.

<sup>112</sup> See JOHN PASSMORE, MAN'S RESPONSIBILITY FOR NATURE: ECOLOGICAL PROBLEMS AND WESTERN TRADITIONS 110 (1974); Holmes Rolston III, *Is There an Ecological Ethics?*, 85 ETHICS 93 (1975).

<sup>113</sup> See, e.g., MARSHALL, *supra* note 109, at 143.

found in the nineteenth century writings of George Perkins Marsh,<sup>114</sup> Henry David Thoreau,<sup>115</sup> and John Muir,<sup>116</sup> and, in this century, Aldo Leopold,<sup>117</sup> Rachel Carson,<sup>118</sup> Wallace Stegner,<sup>119</sup> Terry Tempest Williams,<sup>120</sup> and Wendell Berry.<sup>121</sup> In Leopold's classic articulation of the land ethic: "A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise."<sup>122</sup> Today, this land ethic is found in the concept of sustainability, which the United Nations Commission on Economic Development defines as "meet[ing] the needs of the present [generation] without compromising the ability of future generations to meet their own needs."<sup>123</sup>

Yet another insight into the question of why species should matter to humans is Edward O. Wilson's *Biophilia Hypothesis*, which posits that millions of years of co-evolution has forged a strong psychological bond between humans and other living creatures.<sup>124</sup> The biophilia hypothesis may explain why wildlife plays such a prominent role in our literary traditions, art, recreational pursuits and all manner of cultural icons, from team mascots to Madison Avenue advertising campaigns.<sup>125</sup> It may also provide clues to why public opinion polls consistently show such strong support for species preservation.<sup>126</sup> A planet bereft of lions and tigers and

<sup>114</sup> See, e.g., GEORGE PERKINS MARSH, *MAN AND NATURE* (1864).

<sup>115</sup> See, e.g., HENRY DAVID THOREAU, *WALDEN AND CIVIL DISOBEDIENCE* (Sherman Paul ed., 1960).

<sup>116</sup> See, e.g., JOHN MUIR, *OUR NATIONAL PARKS* (1970).

<sup>117</sup> See, e.g., Leopold, *The Land Ethic*, in *A SAND COUNTY ALMANAC*, *supra* note 96, at 217.

<sup>118</sup> See, e.g., RACHEL CARSON, *SILENT SPRING* (1962).

<sup>119</sup> See, e.g., WALLACE STEGNER, *WHERE THE BLUEBIRD SINGS FROM THE LEMONADE SPRINGS: LIVING AND WRITING IN THE WEST* (1992).

<sup>120</sup> See, e.g., TERRY TEMPEST WILLIAMS, *REFUGE: AN UNNATURAL HISTORY OF FAMILY AND PLACE* 281-90 (1991) (discussing one family's confrontation with cancer believed to be the result of above ground nuclear testing in Utah).

<sup>121</sup> See, e.g., WENDELL BERRY, *HOME ECONOMICS* (1987).

<sup>122</sup> Leopold, *The Land Ethic*, in *A SAND COUNTY ALMANAC*, *supra* note 95, at 240.

<sup>123</sup> WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, *OUR COMMON FUTURE* 43 (1987).

<sup>124</sup> See *THE BIOPHILIA HYPOTHESIS* (Stephen R. Kellert & Edward O. Wilson eds., 1993).

<sup>125</sup> Dr. Wilson says animals, such as snakes, are "agents of nature that are translated into symbols of culture." See *The Serpent*, in WILSON, *BIOPHILIA*, *supra* note 19, at 97-101.

<sup>126</sup> See B. CZECH & PAUL R. KRAUSMAN, *PUBLIC OPINION ON SPECIES AND ENDANGERED SPECIES CONSERVATION* (1997). According to this poll, 84% of Americans would support stronger endangered species laws.

bears, indeed, of most the wild creatures that currently inhabit it, does sound like a pretty lonely place.

To summarize Part I, the biodiversity crisis is real, and the stakes are high. Extinction estimates may vary by a wide margin, but they all agree on the central point that the current rate is far beyond any definition of "normal," and it is increasing.<sup>127</sup> Each extinction, no matter how inconsequential it may appear in isolation, represents another strand removed from the fabric of life, another rivet popped from the wing of the airplane.<sup>128</sup> Neo-classical economics tells us almost nothing about the dollar value of individual species, let alone the cumulative value of the services that healthy ecosystems provide.<sup>129</sup> The emerging field of ecological economics is beginning to get a handle on these values, and the numbers being generated, though soft, are huge.<sup>130</sup> Yet in the end it is not what we know but what we do not know that may provide the most cogent argument for exercising the "precautionary principle," for trying to save "every cog and wheel," not just for ourselves but for the next seven generations to come.<sup>131</sup>

All well and good, you may be thinking, but isn't habitat loss and even extinction simply the inevitable, albeit unfortunate, price we must pay for "progress?" A look at the roots of the biodiversity crisis might shed some light on this question.

## II. THE ROOTS OF THE BIODIVERSITY CRISIS: MARKET AND POLICY FAILURES

Most environmental problems, and certainly habitat destruction and species endangerment, have their roots in our economic and political systems. This section reviews the reasons why the market fails to properly value biological resources and why government policies to date have failed to correct the market's shortcomings.

### A. *Market Failures*

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<sup>127</sup> See EXTINCTION RATES, *supra* note 24, at 10-16.

<sup>128</sup> See EHRLICH, EXTINCTION, *supra* note 22, at xi.

<sup>129</sup> See *id.* at 53-76.

<sup>130</sup> See ENVIRONMENTAL ECONOMICS, *supra* note 102, at 312-13.

<sup>131</sup> See *id.* at 32-33 (discussing intergenerational responsibility for environmental damage).

### 1. *The Market Undervalues Biodiversity*

How much is a bald eagle worth? Conventional economic analysis would attempt to answer this question by looking at such things as the amount of money that birdwatchers spend on binoculars, Peterson's Field Guides, gasoline, pre-dawn breakfasts at the local diner, and maybe the cost of a motel room.<sup>132</sup> That approach may work, at least at some level, for charismatic species, like eagles and whooping cranes, but how about the Delhi Sands flower-loving fly,<sup>133</sup> or the cave mold beetle?<sup>134</sup> Not many people would drive a block to catch a glimpse of one of these odd-sounding organisms. Yet the fact that something is hard to count does not mean it is not worth counting. As the example of the Pacific yew illustrates, one person's trash may be another's cancer cure.<sup>135</sup>

### 2. *The Market Treats Biodiversity As A Free Good*

There are no property rights in wild organisms; biodiversity is part of the "global commons."<sup>136</sup> Thus, the market treats biological resources as "free goods" for the taking, at least until some legal regime is created to control access to such organisms and establish protocols for how property rights are to be acquired, including in some instances protection for the rights of indigenous people.<sup>137</sup> As with every other "commons"

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<sup>132</sup> This is the classic "travel cost method," which attempts to value natural resources based on what people are willing to spend to visit them. See ENVIRONMENTAL ECONOMICS, *supra* note 102, at 116-18, 119 tbl.1.

<sup>133</sup> The habitat of the fly is located entirely within an eight mile radius in southwestern San Bernadino County, California. See National Association of Homebuilders v. Babbitt, 130 F.3d 1041, 1044 (D.C. Cir. 1997). The fly is a pollinator, a member of the mydas flies family, which is rare in North America. See *id.* at 1043 (upholding the constitutionality of the ESA's "take" prohibition as it applies to the fly). Scientists are just beginning to understand the crucial role that pollinators play in the ecosystem, including the production of food items. See BUCHMANN & NABHAN, *supra* note 68, at 257.

<sup>134</sup> The beetle is one of 40 species involved in the Balcones Canyonlands Habitat Conservation Plan. See REED F. MOSS, ET AL., THE SCIENCE OF CONSERVATION PLANNING 41 (1997). Beetles, the most numerous species on earth, are decomposers, performing a not very glamorous but essential job in soil formation. See WILSON, DIVERSITY OF LIFE, *supra* note 20, at 137, 140.

<sup>135</sup> See NATURE'S SERVICES, *supra* note 62, at 263.

<sup>136</sup> See MCNEELY, *supra* note 57, at 10.

<sup>137</sup> See MICHAEL A. GOLLIN, *An Intellectual Property Rights Framework For Biodiversity Prospecting*, in BIODIVERSITY PROSPECTING, *supra* note 18, at 159-93 (1993).

problem, for example, the collapse of many ocean fisheries,<sup>138</sup> the economic incentives are heavily skewed towards exploitation and away from conservation.<sup>139</sup> Why would any "rational" economic person forego taking the last cod, or the last rosy periwinkle, knowing a competitor might grab it?<sup>140</sup>

This problem is exacerbated by the time lag phenomenon.<sup>141</sup> For some species, the point of no return is reached long before anyone knows it. The passenger pigeon is a case in point. Once so numerous that they "darkened the sky," the passenger pigeon was literally hunted out of existence: its population went from over a billion to exactly zero.<sup>142</sup> Yet even though there were still millions of passenger pigeons extant when hunting was outlawed, the species was doomed because its population had already dropped below its viable level.<sup>143</sup>

The northern spotted owl provides a more recent example. When the U.S. Fish and Wildlife Service, in response to a court order, proposed to list northern spotted owl as a threatened species,<sup>144</sup> timber company biologists took to the field searching for owls, hoping to demonstrate that there were a lot more owls than people thought.<sup>145</sup> There were.<sup>146</sup> But that did not change the fact that the species was on an "extinction trajectory" as demonstrated by population models and demographic studies.<sup>147</sup> The

<sup>138</sup> See MEADOWS ET AL., *supra* note 83, at 185-88. According to the latest report of the National Marine Fisheries Service, major U.S. fish stocks are "severely depleted," and will require 5-20 years to recover. See George Reiger, *Troubled Waters: Most Anglers are Content to Leave Management to the "Experts"—And so the Pelagic Fisheries Continue to Dwindle and Vanish*, FIELD & STREAM, May 1, 1998, at 28.

<sup>139</sup> See MCNEELY, *supra* note 57, at 12-13.

<sup>140</sup> See Garrett Hardin, *The Tragedy Of The Commons*, 162 SCIENCE 1243, 1244 (1968).

<sup>141</sup> Time lag phenomenon refers to the delayed effect of a certain type of environmental harm.

<sup>142</sup> See QUAMMEN, THE SONG OF THE DODO, *supra* note 42, at 307.

<sup>143</sup> See *id.* The passenger pigeon was a "colony species," meaning that it relied on congregating in huge groups as a defense against predators. See *id.* By the time hunting was outlawed the population had dropped below its evolutionarily-determined critical mass. See *id.* at 312. See also, Daniel F. Doak, *Source-Sink Models and the Problem of Habitat Degradation: General Models and Applications to the Yellowstone Grizzly*, 9 CONSERVATION BIOLOGY 1370, 1377 (1995).

<sup>144</sup> See *Northern Spotted Owl v. Hodel*, 716 F. Supp. 479 (W.D. Wash. 1988).

<sup>145</sup> See YAFFEE, *supra* note 86, at 60-68.

<sup>146</sup> See *id.*

<sup>147</sup> See Russell Lande, *Risks of Population Extinction From Demographic and Environmental Stochasticity and Random Catastrophes*, 142 AM. NATURALIST 911, 921-23 (1993).

problem was not simply the immediate size of the owl's population but the fact that it was in precipitous decline across its entire range, and that the decline was directly related to the loss of its specialized old growth habitat.<sup>148</sup> In fact, what the owl counters were observing was a "packing" phenomenon, meaning that owls were crowding into smaller and smaller habitat patches.<sup>149</sup> It was a case of less habitat, not more owls. Eventually, this view of the population ecologists prevailed and became the foundation of the Clinton Forest Plan, which reduced old growth logging by eighty percent and set aside large, though perhaps not large enough, tracts of federal land for the owl and other old growth related species such as the Pacific salmon and the marbled murrelet.<sup>150</sup> This multi-species, landscape-scale plan, organized by watersheds, was initially hailed as a prototype "ecosystem management plan," but the end result, known as Option 9, has received sharp criticism from the science community for failing to ensure the long term viability of the affected species.<sup>151</sup>

### 3. *The Market Treats Extinction as an Externality*

Habitat loss is a classic externality.<sup>152</sup> For example, the price paid for timber and forest products does not reflect the costs of erosion, flooding, stream sedimentation, habitat destruction, species extinction, and global warming caused by road-building and large scale deforestation.<sup>153</sup> Instead these costs are imposed on other landowners, the public, and future

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<sup>148</sup> See YAFFEE, *supra* note 86, at 47-48.

<sup>149</sup> See generally Yaffee, *supra* note 86.

<sup>150</sup> See *Seattle Audubon Society v. Lyons*, 871 F.Supp. 1291, 1305 (W.D. Wash. 1994).

<sup>151</sup> See KATHIE DURBIN, *TREE HUGGERS: VICTORY, DEFEAT & RENEWAL IN THE NORTH-WEST ANCIENT FOREST CAMPAIGN* 202-08 (1996). The Wildlife Society, The Ecological Society of America, and the American Institute of Biological Sciences were among the scientific organizations critical of Option 9. See *id.* at 207-08.

<sup>152</sup> Economists define an externality as "the unintended effect[] of production or consumption by firms or consumers that are not mediated by markets and thus impose costs (or deliver benefits) that are not reflected in the price of transactions." PRUGH ET AL., *supra* note 75, at 129. For example, hydropower dams can decimate fisheries and lead to extinctions, as they have in the Pacific Northwest, but ratepayers do not see a "biodiversity loss surcharge" in their monthly electric bills. See *id.* at 130.

<sup>153</sup> See MCNEELY, *supra* note 57, at 10-12. Forests are "carbon sinks," the loss of which contributes to global warming. See, e.g., Joy E. Hecht & Brett Orlando, Dialogue, *Can the Kyoto Protocol Support Biodiversity Conservation? Legal and Financial Challenges*, 28 ENVTL. L. REP. 10508 (1998).



generations.<sup>154</sup> To remedy this type of market failure, some economists, most notably the Nobel Laureate Ronald Coase, argue that those who are injured should pursue private damage actions, using common law tort theories.<sup>155</sup> Setting aside ethical and policy problems for a moment, this approach has serious legal and practical limitations. For openers, there is no tort of extinction. The law regards wildlife as *res nullius*,<sup>156</sup> the property of no one until "reduced to lawful possession."<sup>157</sup>

The demise of the dusky seaside sparrow is a case in point.<sup>158</sup> The dusky became extinct in 1987, the result of cumulative habitat loss over several decades.<sup>159</sup> No one set out to extirpate the dusky; it was simply the unintended consequence of an economic system that treats land as a commodity, to be bought and sold, and converted to its "highest and best use," which in this case meant cattle ranches, highways and subdivisions, leaving too little of the native saw grass savannah in which the dusky evolved.<sup>160</sup>

So, who would have standing to sue for the extinction of the dusky? Whom would they sue? In what court? And what would be the cause of action? Cutting-edge stuff, to be sure.

Assuming that someone with standing could be found (a large assumption given the Supreme Court's current propensity for limiting standing in environmental cases),<sup>161</sup> the most likely claim would rest on some type of public trust or nuisance theory related to habitat destruction.<sup>162</sup> The parties bringing such actions would then have to prove

<sup>154</sup> See DALY & COBB, *supra* note 57, at 55 ("[A]ll external costs and benefits must be 'internalized' in the money price paid by whoever buys the good or service the production of which gave rise to the external cost.").

<sup>155</sup> See, e.g., Ronald Coase, *The Problem of Social Cost*, 3 J. L. & ECON. 1 (1960).

<sup>156</sup> "A thing which has no owner naturally belongs to the first finder." BLACK'S LAW DICTIONARY 1310 (6th ed. 1990). See also BEAN & ROWLAND, *supra* note 14, at 34.

<sup>157</sup> See *Pierson v. Post*, 3 Caines 175 (1805). State, federal, and tribal governments can sue to recover damages for injuries to natural resources under the *parens patriae* doctrine. See, e.g., *Puerto Rico v. S.S. Zoe Colocotroni*, 628 F.2d 652, 670 (1st Cir. 1980). But money damages can never undo extinction.

<sup>158</sup> See, e.g., MARK JEROME WALTERS, *A SHADOW AND A SONG* (1987).

<sup>159</sup> See *id.* at 1-10.

<sup>160</sup> See *id.* at 127.

<sup>161</sup> See, e.g., *Lujan v. National Wildlife Federation*, 497 U.S. 871 (1990); *Lujan v. Defenders Of Wildlife*, 504 U.S. 555 (1992); *Steel Company v. Citizens For A Better Environment*, 118 S.Ct. 1003 (1998).

<sup>162</sup> See, e.g., Harry R. Bader, *Antaeus and the Public Trust Doctrine: A New Approach to Substantive Environmental Protection in the Common Law*, 19 B.C. ENVTL. AFF. L. REV. 749, 754-61 (1992).

causation, a tough challenge even in the most straightforward pollution case, but doubly so in species endangerment situations, where the number of potentially responsible parties and contributing factors, some natural, some anthropogenic, some unknown, some unknowable, pose especially difficult hurdles. Add in the time lag phenomenon mentioned above, and the proof problems can become insurmountable.<sup>163</sup>

Assuming liability can be established, the next hurdle to overcome is how to measure and prove damages for injury to biological resources that have no ready market value. Quantifying non-use values, using methodologies such as contingent valuation and willingness-to-pay concepts,<sup>164</sup> while judicially recognized for some purposes,<sup>165</sup> raise difficult evidentiary questions in private damage actions.<sup>166</sup>

Finally, even if a case of this type is successful, the best that one can hope for is an after-the-fact payment of compensatory damages, and perhaps punitive damages to deter conduct that arguably could have been avoided in the first place with a better understanding of ecological systems and proper planning. Thus, from a purely practical standpoint, private damage actions are a poor means of protecting biodiversity. Moreover the notion that humans have a right to extirpate species so long as they "pay for it" raises troubling ethical questions.

It seems clear that market solutions alone will not stem the loss of habitat, and that some form of government intervention is required. Of course, there are many types of government intervention, at different levels, and the most appropriate combination will depend upon the nature of the problem and the capabilities of different levels of government with authority to take action. An argument can be made, for example, that environmental problems ought to be handled at the state or even local level whenever possible; unfortunately, this flies in the face of the first

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<sup>163</sup> See *supra* note 141 and accompanying text.

<sup>164</sup> See Richard T. Carson & Robert Cameron Mitchell, *Contingent Valuation and The Legal Arena*, in VALUING NATURAL ASSETS: THE ECONOMICS OF NATURAL RESOURCE DAMAGE ASSESSMENT 231 (Raymond J. Kopp & V. Kerry Smith eds., 1993).

<sup>165</sup> See *Ohio v. United States Dep't. of the Interior*, 880 F.2d 432 (D.C. Cir. 1989) (upholding use of contingent valuation in Natural Resource Damage Assessment Regulations under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA)).

<sup>166</sup> See *Colorado v. Idarado Mining Co.*, 707 F. Supp. 1227 (D. Colo. 1989), *rev'd*, 916 F.2d 1486 (10th Cir. 1990), *cert. denied* 499 U.S. 960 (1991) (upholding that the District Court did not have the authority under CERCLA to grant injunctive relief requiring the mining company to carry out remedial cleanup plan proposed by the state).

principle of ecology, which teaches that all things are interconnected in an elaborate network of cycles, feedback loops, and synergistic effects.<sup>167</sup> Political boundaries do not confine ecosystems, or the threats to them. For example, much of the mercury found in Lake Champlain comes from powerplants in the Upper Midwest.<sup>168</sup> Smog in Maine originates with the morning commute in Richmond, Virginia and gathers pollutants as it rides the prevailing winds up the eastern seaboard.<sup>169</sup> The water quality of Chesapeake Bay reflects land use decisions made by millions of people living in a five state basin.<sup>170</sup> Successful resolution of problems like these obviously requires affirmative and cooperative action by all levels of government.

#### 4. *Cost-Benefit Analysis Discounts the Future*

Cost-benefit analysis (CBA) is often touted as the only rational way to allocate resources to meet a variety of social purposes.<sup>171</sup> But CBA suffers from two serious defects when it comes to valuing biodiversity. First, CBA discounts future costs and benefits to current dollars, using a somewhat arbitrary rate of interest called the discount rate.<sup>172</sup> The higher the discount rate, the less value is assigned to future benefits—precisely the kind of benefits biodiversity provides.<sup>173</sup> Likewise, future costs are discounted, which leads to public investments in dubious “flood control structures” that lure development into the floodplain, then fail, leading to the kind of devastating consequences that occurred in the Mississippi

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<sup>167</sup> See FRITJOF CAPRA, *THE WEB OF LIFE: A NEW SCIENTIFIC UNDERSTANDING OF LIVING SYSTEMS* 297-304 (1996).

<sup>168</sup> See NORTHEAST STATES AND EASTERN CANADIAN PROVINCES, *MERCURY STUDY: A FRAMEWORK FOR ACTION E-6* (1998).

<sup>169</sup> See U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 1, *STATE OF THE NEW ENGLAND ENVIRONMENT* 10-11 (1998).

<sup>170</sup> See *supra* note 53 and accompanying text; Pollack, *supra* note 65, at 52-53.

<sup>171</sup> Cost-benefit analysis is the “analytical technique used to appraise projects with quantifiable benefits and costs over a finite planning horizon . . . . A benefit foregone is a cost just as much as a cost avoided is a benefit.” MCNEELY, *supra* note 57, at 196.

<sup>172</sup> The discount rate is the interest rate used to determine the present value of a future benefit by discounting. See ENVIRONMENTAL ECONOMICS, *supra* note 102, at 97. For example, if a dollar is invested at five percent, and compounded annually, it will be worth \$1.63 in ten years. See *id.* But for CBA analysis, the net present value of the \$1.63 is still only \$1. See *id.* at 97-99.

<sup>173</sup> See MCNEELY, *supra* note 57, at 13.

River Basin in 1993.<sup>174</sup> Economist Herman Daly has characterized discounting as “a psuedo-scientific way of making the ethical judgment that the future is not worth anything.”<sup>175</sup>

Second, CBA analysis places a premium on a rapid rate of return on investment.<sup>176</sup> This reflects the realities of Wall Street, where disappointing earnings in one quarter can send stock prices tumbling.<sup>177</sup> Unfortunately the value of biodiversity lies in much longer time horizons. In sum, CBA is strongly biased in favor of immediate investment and quick returns, neither of which favor the kind of long term commitment required to realize the economic benefits of conserving biodiversity, and to avoid loading the costs of depleted resources and dysfunctional ecosystems on future generations.<sup>178</sup>

### 5. *The GDP Treats Biodiversity Loss as Income*

All wealth comes from nature, and biodiversity is the natural capital upon which we draw to create prosperity.<sup>179</sup> Perversely, however, the system we use to measure the health of the nation's economy, the Gross Domestic Product (GDP), actually counts both pollution and resource depletion as income.<sup>180</sup> In the amoral world of economics, pollution is not all bad because it generates lots of expenditures for cleanup: the Exxon *Valdez* goes down and GDP goes up by \$2.5 billion in cleanup costs.<sup>181</sup> Superfund sites thus become more valuable than wetlands. Even cancer has a silver lining; all those lawsuits against the tobacco industry have certainly made a lot of lawyers and consultants wealthy. What matters to the GDP is that money is spent, not what it buys.<sup>182</sup>

Recognizing these shortcomings, many economists and policy

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<sup>174</sup> See ENVIRONMENTAL ECONOMICS, *supra* note 102, at 270.

<sup>175</sup> DALY, BEYOND GROWTH, *supra* note 81, at 231.

<sup>176</sup> See MCNEELY, *supra* note 57, at 13.

<sup>177</sup> See, e.g., *Starbucks Insiders Unloaded Shares Prior to Results: Linked Stock Decline*, WALL ST. J., Aug. 5, 1998, at C24 (discussing the impact of sluggish sales on stock prices).

<sup>178</sup> See DALY & COBB, *supra* note 57, at 199-206.

<sup>179</sup> See PRUGH ET AL., *supra* note 75, at 19-33.

<sup>180</sup> Clifford Cobb et al., *If GDP Is Up, Why Is America Down?*, ATLANTIC MONTHLY, Oct. 1995, at 59. The authors liken the GDP to a “calculator that can add but cannot subtract.” See *id.* at 65. GDP counts expenditures on cleanup as income.

<sup>181</sup> See JOEL MAKOWER, THE E-FACTOR 35 (1994).

<sup>182</sup> See DALY & COBB, *supra* note 57, at 65.

analysts have called for reforms that would correct the most egregious errors in our national accounting system.<sup>183</sup> Some have urged that the GDP be scrapped entirely and replaced with an Index of Sustainable Economic Welfare.<sup>184</sup>

## B. *Policy Failures*

Instead of correcting for these market failures, government at all levels, but especially at the national level, tends to exacerbate them in many cases. The federal government has at least four huge policy levers to exert on environmental problems in general and biodiversity loss in particular: tax, fiscal, regulatory, and public lands management. However, as discussed below, federal policy in each of these areas is headed in the wrong direction.

### 1. *Tax Policy*

It is axiomatic that you get less of whatever you tax. Thus, a rational tax policy should seek to tax those things that are "bad" and avoid taxing things that are "good." Our tax policy, by and large, does the opposite. Instead of taxing waste we tax income.<sup>185</sup> Instead of encouraging resource conservation, we reward depletion with tax benefits.<sup>186</sup> Instead of creating incentives to keep large land holdings intact, we force divestiture with steep investment taxes.<sup>187</sup> Instead of discouraging land speculation and sprawl, we promote it through "highest and best use" property taxes.<sup>188</sup>

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<sup>183</sup> See Robert Repetto, *Accounting for Environmental Assets*, SCI. AM., June 1992, at 94-100.

<sup>184</sup> See DALY & COBB, *supra* note 57, at 401-55, 418-19 tbl.A.1. Professor Daly recommends that the current single metric of the GDP be replaced with the following three accounts: (1) A benefit account to measure the value of the services yielded by all accumulations (including ecosystem services); (2) A cost account to measure the value of depletion, pollution and the "disutility of labor" (consuming resources in "dead-end jobs"); (3) A capital account which would include natural capital such as ecosystem infrastructure (e.g., wetlands). See *id.*

<sup>185</sup> See ROBERT REPETTO ET AL., *GREEN FEES: HOW A TAX SHIFT CAN WORK FOR THE ENVIRONMENT AND THE ECONOMY* vii, 2-7 (1992). See generally ALAN THIEN DURNING & YORAM BAUMAN, *TAX SHIFT* (1997).

<sup>186</sup> See REPETTO ET. AL., *supra* note 185, at 2.

<sup>187</sup> See *id.* at 3-4.

<sup>188</sup> See DURNING & BAUMAN, *supra* note 185, at 25.

None of this makes our tax system popular (the IRS is hated even more than the EPA) nor conducive to savings and investment, two important factors in capital formation and job creation. From both an economic and environmental perspective, shifting taxes from income to waste makes a lot of sense. But there is very little prospect of that happening at the federal level anytime soon.<sup>189</sup> There may be more opportunities to experiment with tax shift laws at the state level, and coalitions of environmental, business, consumer, and community interests are forming around these initiatives in a number of areas.<sup>190</sup>

## 2. Fiscal Policy

The Federal Government spends more on habitat destruction than on habitat acquisition for endangered species: subsidies for extractive industries in agriculture, forest products, mining, and energy are approaching \$40 billion per year,<sup>191</sup> whereas the total amount spent on acquisition of habitat for endangered species in the past thirty years is less than \$400 million.<sup>192</sup> Even though funding for endangered species programs has increased three-fold since 1976, the number of listed species has increased more than five-fold.<sup>193</sup>

There are many opportunities to redirect these misspent subsidies towards investments in ecosystem restoration, species recovery, pollution abatement, and resource conservation in general.<sup>194</sup> Having ended

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<sup>189</sup> In his first term, President Clinton proposed a hefty energy tax to help reduce the budget deficit. The idea met a firestorm of protest from congressional members from oil-producing states, and was quickly abandoned. *See generally* Dawn Erlandson, *The BTU Tax Experience: What Happened and Why it Happened*, 12 PACE L. REV. 173 (1994).

<sup>190</sup> In Vermont, for example, a coalition of environmental, consumer and business groups succeeded in getting a carbon tax bill introduced in the 1998 legislative session. Though no action was taken, it is expected to be considered again in 1999. Telephone interview with Brian Dunkiel, Tax Policy Director, Friends of the Earth (June 12, 1998). Similar efforts are underway in Minnesota, Oregon and Maine. *See generally* FRIENDS OF THE EARTH, CITIZENS GUIDE TO ENVIRONMENTAL TAX SHIFTING (1998).

<sup>191</sup> *See generally* MASSPIRG, GREEN SCISSORS '97 (1997). Friends of the Earth maintains a website with regular updates on the Green Scissors campaign to eliminate environmentally destructive subsidies. *See* Friends of the Earth at <<http://www.foe.org>>.

<sup>192</sup> *See* ENVIRONMENTAL DEFENSE FUND, REBUILDING THE ARK 6 fig.6 (1996) [hereinafter REBUILDING THE ARK].

<sup>193</sup> *See id.* at 2.

<sup>194</sup> *See generally* DAVID MALIN ROODMAN, THE WORLDWATCH INSTITUTE, THE NATURAL WEALTH OF NATIONS: HARNESSING THE MARKET FOR THE ENVIRONMENT (1998).

"welfare as we know it" for the poor, perhaps Congress can muster the political courage to end it for corporate polluters.<sup>195</sup>

### 3. *Regulatory Policy*

There is no shortage of federal environmental regulations; and no lack of argument over their efficacy. For more than twenty-five years, federal environmental law has been based on the "command and control" regulatory paradigm, under which the EPA sets uniform, national, health-based standards and delegates authority to the states to administer permit programs subject to EPA oversight.<sup>196</sup> While not without its critics, this approach has led to marked improvements in the nation's air and water, primarily through controlling major sources of pollution.<sup>197</sup> However, a number of experts are calling for different models to deal with more diffuse sources of pollution, nonpoint sources, that are preventing environmental goals from being fully realized.<sup>198</sup>

In the biodiversity context, the ESA is the major regulatory program, but it functions quite differently from the pollution control statutes. Rather than set up an elaborate system of technical standards implemented through detailed operating permits, and enforced through elaborate monitoring and reporting requirements, the ESA takes a straightforward prohibitory approach along the lines of "thou shalt not harm endangered species."<sup>199</sup> The Act's requirements are discussed in detail in Part III below. Suffice it to say here that the ESA's tough reputation is vastly overrated, and the many ways around the Act's apparently strict standard of protection are well-lit by administrative policy and practice.<sup>200</sup> Despite a highly visible, and sometimes dishonest,<sup>201</sup> campaign by anti-ESA forces to portray it as a nutty idea that

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<sup>195</sup> See generally FRIENDS OF THE EARTH, DIRTY LITTLE SECRETS (1995).

<sup>196</sup> See generally Clean Water Act, 33 U.S.C. § 1342 (b); Clean Air Act 42 U.S.C. §§ 7661-7661f.

<sup>197</sup> For example, lead emissions have been virtually eliminated, and our nations water bodies meet the Clean Water Act's basic goal of "fishable/swimable."

<sup>198</sup> According to a GAO report, approximately 76% of lakes, 65% of streams, and 45% of estuaries do not meet water quality standards largely due to nonpoint sources of pollution. See U.S. GENERAL ACCOUNTING OFFICE, GREATER EPA LEADERSHIP NEEDED TO REDUCE NONPOINT SOURCE POLLUTION 8 (1990).

<sup>199</sup> See 16 U.S.C. § 1538 (1994).

<sup>200</sup> See discussion *infra* notes 219 to 325 and accompanying text.

<sup>201</sup> See EHRLICH, BETRAYAL OF SCIENCE AND REASON, *supra* note 11, at 107-24; EDWARD FLATTAU, TRACKING THE CHARLATANS, 120-30 (1998).

disrupts the economy and threatens constitutional rights of property and liberty, the plain facts are that: the American economy is fundamentally solid;<sup>202</sup> there has never been a successful ESA claim for compensation based on an unlawful taking under the Fifth Amendment;<sup>203</sup> the ESA gets blamed for "train wrecks" that were actually caused by bad economic and political decisions;<sup>204</sup> and, on balance, the Act's conservation goals have been undermined by chronic underfunding, weak enforcement, political interference and, most recently, an administrative push to make the law more "user-friendly."<sup>205</sup>

The ESA cannot succeed without clear and enforceable standards designed to achieve prompt recovery, and ultimately to prevent endangerment in the first place. But there are many different ways in which such standards can be fashioned. Professor Don Elliott at Yale Law School has coined the term "command and covenant" to describe a more

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<sup>202</sup> Alan Greenspan, the Federal Reserve Board Chair, recently testified before Congress that the economy is the strongest he has "witnessed in [his] near half century of daily observation of the American economy." Jacob M. Schlesinger, *Greenspan Suggests: No Rate Rise Soon*, WALL ST. J., June 17, 1998, at A2.

<sup>203</sup> In *Good v. United States*, the Federal Claims Court held that denial of a Corps of Engineers dredge and fill permit, which the Corps based in large part on the "biological opinion" of the Fish and Wildlife Service that the project would jeopardize an endangered species, was not a taking because the opinion outlined several "reasonable and prudent alternatives" that the landowner could take to avoid the problem. See *Good v. United States*, 31 Fed. Cl. 81 (Fed. Cl. 1997).

<sup>204</sup> The most notorious of which, of course, is the northern spotted owl. The blame for that debacle, however, rests squarely on the shoulders of the federal land management agencies, the Forest Service and the Bureau of Land Management, and more precisely, on the political appointees who controlled them. See YAFFEE, *supra* note 86; DIETRICH, *supra* note 90; DURBIN, *supra* note 151; BARKER, *supra* note 90; ERVIN, *supra* note 90. Perhaps Judge Dwyer, in issuing the injunction that basically shut down the logging program on the National Forests in the Northwest, said it best:

More is involved here than a simple failure by an agency to comply with its governing statute. The most recent violation of [The National Forest Management Act] exemplifies a deliberate and systematic refusal by the Forest Service and the FWS to comply with the laws protecting wildlife. This is not the doing of the scientists, foresters, rangers, and others at the working levels of these agencies. It reflects decisions made by higher authorities in the executive branch of government.

*Seattle Audubon Society v. Evans*, 771 F. Supp. 1081, 1090 (W.D. Wash. 1991), *aff'd.*, 952 F.2d 297 (9th Cir. 1991).

<sup>205</sup> See 63 Fed. Reg. 8859 (1998) (to be codified at 50 C.F.R. Part 17 and 50 C.F.R. part 222). See John Kostyack, *Surprise!*, 15 ENVTL. F. 19, 21 (1998).



flexible approach to regulations which would set clear, enforceable performance standards while allowing regulated entities to choose the most cost-effective means of achieving them.<sup>206</sup> However, designing effective performance standards is not easy. It requires a level of quantitative information about the nature of the environmental problem to be addressed that typically does not exist, and may be prohibitively expensive to obtain. For example, how much old growth forest is needed to provide suitable habitat to maintain viable populations of northern spotted owls and other old growth dependent species, in perpetuity?<sup>207</sup> Still, in those cases where it is possible to set specific, measurable, and enforceable performance standards, the approach is worth considering.

#### 4. *Public Lands Policy*

The Federal Government owns one-third of the nation's land base, most of it in the West, making it the largest habitat manager in the country. These lands contain much of what is left of America's natural heritage.<sup>208</sup> The bulk of this land is managed by two federal agencies, the U.S. Forest Service (USFS) and the Bureau of Land Management (BLM), and both operate under organic statutes based on the "multiple-use" paradigm imported into this country from Europe in the nineteenth century and put into practice by Gifford Pinchot, the first Chief of the Forest Service.<sup>209</sup> Over the years, multiple use has come to mean "dominant use" and usually the dominant user is commodity-driven—mining grazing, logging, oil and gas extraction, hydropower production, etc.—except for some relatively small pieces of the federal estate (adding up to less than

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<sup>206</sup> See E. Donald Elliott, *Toward Ecological Law and Policy*, in THINKING ECOLOGICALLY 170 (Daniel C. Esty & Marian R. Chertow eds., 1997).

<sup>207</sup> The commonly accepted definition of species viability is a 99% chance of survival for 100 years in the face of stochastic (random) events, such as floods, hurricanes, volcanic eruptions, and fires. See Craig M. Pease & Russell Lande, *Population Viability Analysis*, 3 ENCYCLOPEDIA OF ENVIRONMENTAL BIOLOGY 203, 204 (1995).

<sup>208</sup> See Lawrence J. McDonnell & Sarah Bates, *Rethinking Resources: Reflections on a New Generation of Natural Resources Policy and Law*, in NATURAL RESOURCES POLICY AND LAW 12 (Lawrence J. MacDonnell & Sarah F. Bates eds., 1993).

<sup>209</sup> See GEORGE CAMERON COGGINS ET AL., FEDERAL PUBLIC LAND AND RESOURCES LAW 606 (3d ed. 1993). The multiple-use paradigm is enshrined in several laws including The Multiple Use-Sustained Yield Act of 1960, 16 U.S.C. §§ 528-531 (1994); The National Forest Management Act, 16 U.S.C. § 1601(d) (1994); and The Federal Land Policy and Management Act, 43 U.S.C. § 1732(a) (1994). See COGGINS, *supra*, at 622-31.

five percent) carved out for wilderness or other special use designation.<sup>210</sup> As a result, these multiple-use lands have lost much of their ecological integrity and biodiversity.<sup>211</sup> They have become fragmented, degraded and exhausted by extractive industries pursuing boom-bust, environmentally-destructive activities that have left scars on the land and on the communities they often created, then abandoned.<sup>212</sup>

Even federal lands that are supposedly set aside for conservation purposes, such as National Parks and National Wildlife Refuges, have too often been co-opted to other purposes. In the case of many Refuges, for example, "secondary uses" such as grazing, mining, and motorized recreation, have been allowed to damage the primary purposes of wildlife conservation.<sup>213</sup> National Parks have become overwhelmed with public demand for recreation, complete with roads, parking lots, lodges, gift shops, restaurants, water slides and other amenities, to the point that they look more like a Disney theme park than unspoiled nature.<sup>214</sup> And as the recent debacle over the slaughter of bison outside Yellowstone Park shows, politics can just as easily trump science in the Park Service as it has in every other federal agency.<sup>215</sup>

To summarize Part II, the roots of the biodiversity crisis lie deep within our economic and political institutions, and that is where solutions ultimately must be found. The economic model that has produced such enormous wealth in this country, and is now the global model, also has put enormous stress on the biosphere—a level of stress that cannot continue

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<sup>210</sup> See THE WILDERNESS SOCIETY, FACT SHEET: AMERICA'S PUBLIC LANDS (1996) (on file with author).

<sup>211</sup> See REED NOSS & ALAN COOPERIDER, SAVING NATURE'S LEGACY: PROTECTING AND RESTORING BIODIVERSITY 178-297 (1994).

<sup>212</sup> See, e.g., THOMAS MICHAEL POWER, LOST LANDSCAPES AND FAILED ECONOMIES (1995).

<sup>213</sup> See Richard J. Fink, *The National Wildlife Refuges: Theory, Practice and Prospect*, 18 HARV. ENVTL. L. REV. 1, 63-76 (1994); U.S. GENERAL ACCOUNTING OFFICE, NATIONAL WILDLIFE REFUGES: CONTINUING PROBLEMS WITH INCOMPATIBLE USES CALL FOR BOLD ACTION 3 (1989). As a result of a broad-based settlement in a case brought by several national conservation organizations, the Department of Interior has begun to eliminate incompatible uses on Refuges. See *National Audubon Society v. Babbitt*, CV NO. C92-1643 (W.D. Wash. 1993).

<sup>214</sup> See generally ALSTON CHASE, *PLAYING GOD IN YELLOWSTONE* (1986).

<sup>215</sup> The bison were killed for fear they would infect domestic livestock with brucellosis, despite the fact that there has never been a documented case of such transmission. See Doug Peacock, *Yellowstone Bison Slaughter*, WILD EARTH, Summer 1997, at 6; Todd Wilkinson, *Home on the Range*, HIGH COUNTRY NEWS, Feb. 1997, at 1.

without serious consequences for human well-being at some point in the not-so-distant future. In fact, the decisions made over the next two decades will largely determine what kind of world we and our descendants will inhabit.<sup>216</sup> Simply put, we cannot continue spending our natural capital at current rates without reaping the consequences of a depleted, biologically impoverished world.

We need a new economic model, one based on genuine principles of sustainability, starting with sustaining the health of the ecosystems on which the well-being of all life depends. This sounds difficult, and it is, but it is not impossible. Models of sustainable living are starting to emerge.<sup>217</sup> The law cannot mandate all the changes needed but at least it should not be an impediment.

The ESA is supposed to be the strongest wildlife conservation law in the world.<sup>218</sup> Next, we look at whether it lives up to that reputation.

### III. HOW THE ESA IS SUPPOSED TO WORK

The grandly stated purpose of the 1973 ESA is to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved."<sup>219</sup> In fact, however, the ESA does not come close to being a law that protects ecosystems. It functions more like a hospital emergency room, treating basket cases, one at a time, as they come through the doors on stretchers. The attending physicians, namely the Fish and Wildlife Service (FWS) in the Department of Interior and the National Marine Fisheries Service (NMFS) in the Department of Commerce, seek first to stabilize the patients, stop the hemorrhaging (population decline), give them transfusions (captive breeding and reintroduction) as needed, and move them to the long term recovery ward

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<sup>216</sup> See Bill McKibben, *A Special Moment In History*, ATLANTIC MONTHLY, May 1998, at 78. After reviewing the latest figures on population growth, global warming, species extinction, and pollution trends, McKibben concludes: "The next fifty years are a special time. They will decide how strong and healthy the planet will be for centuries to come." *Id.*

<sup>217</sup> See generally ALAN WEISMAN, GAVIOTAS: THE VILLAGE TO REINVENT THE WORLD (1995); DALY, BEYOND GROWTH, *supra* note 81; MEADOWS ET AL., *supra* note 83; AL GORE, EARTH IN THE BALANCE (1992); PAUL HAWKEN, THE ECOLOGY OF COMMERCE (1993). See also Rio Declaration on Environment and Development, June 14, 1992, 31 I.L.M. 874 (1992); Wolfgang Sachs, *Environment and Development: The Story of a Dangerous Liaison*, 21 ECOLOGIST 252 (1991).

<sup>218</sup> See *Tennessee Valley Authority v. Hill*, 437 U.S. 153 (1978).

<sup>219</sup> 16 U.S.C. §1531(b) (1994).

where they administer the prescribed care (recovery plan) to restore health and vitality to the point where they can be discharged from the hospital (delisted). In more formal terms, the statute sets out the following process.

#### A. *Listing And Critical Habitat Designations*

The first step, known as the listing process, is to identify species<sup>220</sup> in trouble, diagnose their condition, and place them on either the threatened or endangered list depending on the precariousness of their situation.<sup>221</sup> Listing decisions are made in the context of informal, notice-and-comment rulemaking under the Administrative Procedure Act (APA).<sup>222</sup> The decision to list must be made “solely on the basis of the best commercial and scientific data available.”<sup>223</sup>

Citizens play a key role in the listing process. The ESA authorizes any person to petition for a listing and sets timetables for the agencies to

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<sup>220</sup> The Act defines the term “species” to include any subspecies of fish or wildlife, and any distinct population segment of any species or vertebrate fish or wildlife which interbreeds when mature.” 16 U.S.C. § 1532(15). Even Charles Darwin might have trouble applying this definition. See Holly Doremus, *Listing Decisions Under the Endangered Species Act: Why Better Science Isn't Always Better Policy*, 75 WASH. U. L.Q. 1029, 1058 (1997) (quoting from a letter written by Mr. Darwin in which he states that pinning down the meaning of species is like “trying to define the undefinable.”). In its report to Congress, The National Research Council (NRC) concluded that the ESA’s inclusion of species, subspecies and distinct population segments was “soundly justified by current science.” See NRC REPORT, *supra* note 23, at 67. However, the NRC concluded that the exclusion of invertebrates below the subspecies level (distinct population segments) was not scientifically valid. See *id.*

<sup>221</sup> An endangered species is one that is “in danger of extinction throughout all or a significant portion of its range.” 16 U.S.C. § 1532(6). A threatened species is one that is “likely to become endangered within the foreseeable future throughout all or a significant portion of its range.” *Id.* § 1532(19). The general factors to be considered in listing are these:

- (A) the present or threatened destruction, modification, or curtailment of its habitat or range;
- (B) overutilization for commercial, recreational, scientific, or educational purposes;
- (C) disease or predation;
- (D) inadequacy of existing regulatory mechanisms;
- (E) other natural or manmade factors affecting its continued existence.

*Id.* § 1533(a)(1).

<sup>222</sup> Administrative Procedure Act, 5 U.S.C. § 552 (1994).

<sup>223</sup> 16 U.S.C. § 1533(b).

respond.<sup>224</sup> If the agency fails to act within the prescribed time, or rejects the petition, the petitioner can file suit under the ESA's citizen suit.<sup>225</sup> Such suits have been successful in a number of cases.<sup>226</sup> For example, a 1993 "mega-suit" filed by several wildlife organizations led to a settlement calling for the listing of 400 species of plants.<sup>227</sup> More recently, the District Court for the District of Columbia ordered the Secretary of Interior to list the Canada lynx.<sup>228</sup>

The ESA also requires the designation of "critical habitat"<sup>229</sup> at the time of listing unless such habitat is not "determinable" or the designation is not "prudent."<sup>230</sup> The Secretary is required to consider the economic impacts of designating critical habitat and is authorized to exclude areas where the costs outweigh the benefits.<sup>231</sup> Critical habitat designations have always been controversial.<sup>232</sup> State and local governments may see it as an unwelcome federal intrusion into local land use matters. Private landowners see it as diminishing the value and development potential of their property.<sup>233</sup> Wary of this political minefield, the wildlife agencies have found lots of reasons not to designate critical habitat: not possible,

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<sup>224</sup> See *id.* § 1533(b)(3). In general, the Secretary has 90 days from receipt of a petition to decide whether it presents "substantial scientific or commercial information indicating that the petitioned action may be warranted." If that finding is made, the Secretary then has 12 months to determine whether the listing is: (a) not warranted (in which case the petition is dismissed and the petitioner may go to court), (b) warranted (in which case the Secretary "shall promptly publish a proposed rule"), or (c) warranted but precluded (e.g., due to lack of resources). See *id.*

<sup>225</sup> See 16 U.S.C. § 1540(g)(1)(c).

<sup>226</sup> See *Northern Spotted Owl v. Lujan*, 758 F. Supp. 621 (N.D. Wash. 1991).

<sup>227</sup> See *Fund For Animals v. Lujan*, Civ. No. 92-800 (D. D.C. 1992).

<sup>228</sup> See *Defenders Of Wildlife v. Babbitt* 958 F. Supp. 670 (D. D.C. 1997).

<sup>229</sup> The Act defines critical habitat as any area containing "physical and biological features essential to the conservation of the species." 16 U.S.C. § 1532(5). The Act distinguishes between occupied and unoccupied habitat. For the latter, the Secretary must make a specific finding that designation is essential to conserving the species. See *id.* § 1532(5)(A)(ii). The Act also provides that critical habitat shall not include the entire geographic area which can be occupied by the species unless the Secretary finds it is essential. See *id.* § 1532(5)(C).

<sup>230</sup> *Id.* § 1533(a)(3).

<sup>231</sup> "The Secretary shall designate critical habitat . . . after taking into consideration the economic impact . . . of specifying any particular area as critical habitat." *Id.* § 1533(b)(2).

<sup>232</sup> See James Saltzman, *Evolution and Application of Critical Habitat Under the Endangered Species Act*, 14 HARV. ENVTL. L. REV. 311 (1990).

<sup>233</sup> See Albert Gidari, *The Endangered Species Act: Impact of Section 9 on Private Landowners*, 24 ENVTL L. 419 (1994).

not prudent, not now.<sup>234</sup> Consequently, despite the statutory command that “[t]he Secretary shall designate critical habitat,”<sup>235</sup> and shall do so “concurrently” with the listing,<sup>236</sup> only one-fifth of listed species have had critical habitat declared.<sup>237</sup>

As with listing decisions, citizens can and do use the ESA’s citizen suit provision to challenge the agencies’ failure to designate critical habitat.<sup>238</sup> On the other side of the coin, opponents of critical habitat designations have had some success arguing that such designations are “major federal actions” within the meaning of the National Environmental Policy Act (NEPA), requiring preparation of an environmental impact statement (EIS).<sup>239</sup> The United States Courts of Appeal are split on this issue, with the Ninth Circuit holding that NEPA’s EIS requirement does not apply to such designations,<sup>240</sup> and the Tenth Circuit holding that it does.<sup>241</sup>

### B. *The Recovery Plan*

The next step in the process is the preparation of a recovery plan, starting with the appointment of a recovery team, comprised of federal and state officials, academics and others with expertise on the subject species.<sup>242</sup> Recovery teams are charged with developing measures to counteract the perceived threats to species, restore habitat, and rebuild depleted populations.<sup>243</sup> The ESA lists several types of recovery measures

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<sup>234</sup> 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. 278, 296 (1993); Heather Weiner, *Going Through the Motions: Fish and Wildlife Services Critical Habitat Moratorium*, ENDANGERED SPECIES UPDATE 40 (May/June 1998) (showing that none of the 178 species listed between 1996 and 1998 had critical habitat designated).

<sup>235</sup> 16 U.S.C. § 1533(b)(2) (1994).

<sup>236</sup> *Id.* § 1533(a)(3)(A).

<sup>237</sup> UNITED STATES GENERAL ACCOUNTING OFFICE, ENDANGERED SPECIES ACT: TYPES AND NUMBER OF IMPLEMENTING ACTIONS 26 (1992) [hereinafter GAO REPORT].

<sup>238</sup> See 16 U.S.C. § 1540(g) (1994). *But see* Northern Spotted Owl v. Lujan, 758 F. Supp. 621 (N.D. Wash. 1991) (indicating that the Secretary is required to designate critical habitat whenever it is “determinable”).

<sup>239</sup> National Environmental Policy Act of 1969, 42 U.S.C. § 4332 (1994).

<sup>240</sup> See Douglas County v. Babbitt, 48 F.3d 1495 (9th Cir. 1995).

<sup>241</sup> See Catron County Bd. v. Babbitt, 75 F.3d 1429 (10th Cir. 1996).

<sup>242</sup> “The Secretary shall develop and implement plans (hereinafter in this subsection referred to as ‘recovery plans’) for the conservation and survival of endangered species and threatened species . . . .” 16 U.S.C. § 1533(f) (1994).

<sup>243</sup> See DANIEL J. ROHLF, STANFORD ENVIRONMENTAL LAW SOCIETY, THE ENDANGERED

including habitat acquisition, prohibitions on hunting and trapping, removal of exotics, pollution abatement, research, captive breeding, and reintroduction.<sup>244</sup> However, the statute establishes no standards for what constitutes an acceptable recovery plan, sets no timetables for either the adoption or accomplishment of the plans, and makes no provision for public participation in the development or implementation of recovery plans.<sup>245</sup>

Although the recovery process is supposed to be the linchpin of the ESA, it has turned out to be more of an Achilles' heel.<sup>246</sup> Understaffed, underfunded, and besieged on all sides, FWS and NMFS have struggled tremendously to move the recovery process forward.<sup>247</sup> The lack of funding is a particular impediment: The 1996 budget for the FWS entire endangered species program was \$57 million, slightly more than the cost for one mile of urban interstate highway.<sup>248</sup> About a third of all listed species do not even have a recovery plan.<sup>249</sup> But the recovery process is also hampered by the lack of clear standards governing what recovery plans must contain and whether they can be enforced, i.e. whether there is "law to apply."<sup>250</sup> Indeed, despite several attempts to enforce the terms of recovery plans, to date only one court has done so.<sup>251</sup>

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SPECIES ACT: A GUIDE TO ITS PROTECTIONS AND IMPLEMENTATION 88-89 ("[T]he recovery team usually consists of representatives from agencies that will be charged with implementing the plan, scientists with expertise about the species involved, representatives from industries that may be affected by the plan, and [Fish and Wildlife Service/National Marine Fisheries Service] personnel.").

<sup>244</sup> See 16 U.S.C. § 1533(f)(1)(B).

<sup>245</sup> See *id.*

<sup>246</sup> See generally Federico Cheever, *The Road To Recovery: A New Way Of Thinking About The Endangered Species Act*, 23 *ECOLOGY L.Q.* 1 (1996).

<sup>247</sup> See *id.* at 7, 26. See also Houck, *supra* note 234, at 346-48.

<sup>248</sup> It costs about \$40 million to build just one mile of urban interstate highway. See T.H. Watkins, *What's Wrong With The Endangered Species Act? Not Much—And Here's Why*, *AUDUBON*, Jan.-Feb. 1996, at 37, 41.

<sup>249</sup> U.S. FISH AND WILDLIFE SERVICE, REPORT TO CONGRESS: ENDANGERED AND THREATENED SPECIES RECOVERY PROGRAM 5 (1994) [hereinafter *FWS RECOVERY REPORT*].

<sup>250</sup> Cheever, *supra* note 246, at 59-67.

<sup>251</sup> See generally *Sierra Club v. Lujan*, 949 F.2d 362 (10th Cir. 1991) ("At least in this case the ESA § 4 duty is mandatory, not discretionary."). But see, *Strahan v. Linnon*, 967 F. Supp. 581 (D. Mass. 1997) (measures in recovery plan are discretionary); *Fund For Animals v. Babbitt*, 903 F. Supp. 96 (D. D.C. 1995) (ESA § 4 duties are discretionary); *Morril v Lujan*, 802 F. Supp. 424, 433 (S.D. Ala. 1992) (duty to prepare recovery plan is mandatory but content is discretionary).

### C. *Delisting And Downlisting*

Once the goals of the recovery plan are achieved, the species can be delisted.<sup>252</sup> But it can take a very long time to reach that point; in fact only eight species have been delisted since 1973.<sup>253</sup> Downlisting, in which a species is moved from endangered to threatened, is an interim step signifying that the species is on the road to recovery.<sup>254</sup> Examples of species considered "fully recovered" include the American alligator and brown pelican.<sup>255</sup> Species that have been "downlisted," as opposed to delisted, include the bald eagle, peregrine falcon and Eastern timber wolf.<sup>256</sup> Recently, Secretary Babbitt announced that another twenty-nine species would be reviewed for both delisting and downlisting.<sup>257</sup> The announcement was greeted with a mixture of praise and skepticism. Some saw it as a sign that the ESA is working;<sup>258</sup> others saw it as a political ploy that did not alter the need for legislative reform.<sup>259</sup>

Like the original listing decision, delisting and downlisting are to be based solely on the "best available science."<sup>260</sup> The ESA does not contain a "triage" provision that would, as some critics argue it should, allow decisions to terminate recovery efforts at some point.<sup>261</sup> FWS has estimated the total cost to recover all of the 1119 species currently listed at \$4 billion.<sup>262</sup>

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<sup>252</sup> See 50 C.F.R. § 424.11(d) (1997).

<sup>253</sup> CONGRESSIONAL RESEARCH SERVICE, *ENDANGERED SPECIES: CONTINUING CONTROVERSY* 3 (1997) [hereinafter CRS REPORT].

<sup>254</sup> See 50 C.F.R. § 424.11(d) (1997).

<sup>255</sup> See Watkins, *supra* note 248, at 40.

<sup>256</sup> See *id.*

<sup>257</sup> See Joby Warrick, *Babbitt Sets Plan to Pare Endangered Species List*, WASH. POST, May 6, 1998, at A3.

<sup>258</sup> In announcing the proposal, Secretary Babbitt stated, "We can finally prove one thing conclusively: the Endangered Species Act works, period." *Id.*

<sup>259</sup> See Traci Watson, *29 Species Taken Off Endangered List*, USA TODAY, May 6, 1998, at A1. A spokesperson for the Earth Justice Legal Defense Fund commented, "We want (delisting) when the time is ripe, not when the political pressure is ripe." *Id.* Representative Richard Pombo (R-California) said that the species "were recovered with no help" from the Endangered Species Act, and pledged to continue his push to provide property owners "relief" from the statute. See *Spotlight Story Species: Babbitt to Upgrade Status of 29 Plants, Animals*, GREENWIRE, May 6, 1998.

<sup>260</sup> 16 U.S.C. § 1533(c)(2).

<sup>261</sup> See generally MANN & PLUMMER, *supra* note 91.

<sup>262</sup> See FWS RECOVERY REPORT, *supra* note 249, at 25.



#### D. *Protections During Recovery*

The listing of a species triggers a series of duties and prohibitions designed to "halt and reverse the trend towards extinction."<sup>263</sup> On paper, the ESA looks like what some have called it—the strongest wildlife protection law in the world.<sup>264</sup> In reality, however, the ESA turns out to be not so formidable, a statute that operates, as will be seen, on a philosophy of compromise and accommodation, relying more on mitigation than prohibition. The ESA's effectiveness turns on three key provisions.

##### 1. *The Duty to Conserve*

One of the most overlooked provisions of the ESA is section 7(a)(1), which provides that "[a]ll other Federal agencies shall, in consultation with and with the assistance of the Secretary, utilize their authorities in furtherance of the purposes of this chapter by carrying out programs for the conservation of endangered species and threatened species."<sup>265</sup> "Conservation" is defined as "the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary,"<sup>266</sup> or in other words, until the species is fully recovered and delisted. Oddly, in spite of its clear and mandatory language, section 7(a)(1) has not had much impact on federal agencies that administer programs with the potential, given the right motivation, to provide valuable assistance in the recovery process.<sup>267</sup> These include land management agencies, such as the BLM, which controls over 180 million acres of land in the lower forty-eight states;<sup>268</sup> and the Forest Service, which manages 201 million acres in the National Forest System.<sup>269</sup> It also

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<sup>263</sup> *Tennessee Valley Authority v. Hill*, 437 U.S. 153, 173 (1978).

<sup>264</sup> *See id.* at 180.

<sup>265</sup> 16 U.S.C. § 1536(a)(1).

<sup>266</sup> *Id.* § 1532(3).

<sup>267</sup> *See* J.B. Ruhl, *Section 7(a)(1) of the 'New ESA': Rediscovering and Redefining the Untapped Power of Federal Agencies Duty to Conserve*, 25 ENV'T L. 1107 (1995) [hereinafter Ruhl, *Section 7(a)(1)*].

<sup>268</sup> *See* COGGINS ET AL., *supra* note 209, at 138 ("In the lower 48 states, the BLM is responsible for the management of nearly 180 million acres of some of the least economically productive land in the country.").

<sup>269</sup> *See id.* at 137.

includes civil works agencies, such as the Army Corps of Engineers (COE) and the Bureau of Reclamation (BuRec), that build and operate water resource projects, many of which have substantially altered the ecology of river systems and estuaries, with severe impacts on fisheries, wildlife and other biological resources.<sup>270</sup>

A positive step was taken in 1994 when twelve federal agencies entered into a Memorandum of Understanding committing to a series of steps to improve the way their lands and programs are administered for the benefit of endangered species "and the ecosystems upon which those species depend."<sup>271</sup>

One reason section 7(a)(1) has not realized its potential for reforming federal policies towards conservation of endangered species is the mixed messages sent by the courts. In the first case to construe the provision, the D.C. District Court held that the Secretary of Interior had a special duty to improve the status of endangered species requiring him to restrict twilight hunting hours on a National Wildlife Refuge to prevent the accidental shooting of a protected species.<sup>272</sup> Subsequent cases have produced mixed results, and often confused and contradictory reasoning by the courts.<sup>273</sup> Two cases involving Pyramid Lake in Nevada illustrate the confusion. In the first case the Ninth Circuit held that section 7(a)(1) authorized the Secretary of Interior to reallocate water rights to protect the threatened cui-ui fish over the objections of irrigators who argued that they had priority claims to the water.<sup>274</sup> But in the second case a different panel of the Ninth Circuit held that the Department of Navy did not have a duty to leave water in Pyramid Lake because the plaintiff Pyramid Lake Tribe had not shown that the amount the Navy wanted to withdraw (to wet down an airfield used for flight exercises) would actually harm the cui-ui.<sup>275</sup> This reasoning seems to fly in the face of the pro-active nature of the duty

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<sup>270</sup> See generally NOSS & COOPERIDER, *supra* note 211, at 271-82.

<sup>271</sup> See Ruhl, *Section 7(a)(1)*, *supra* note 267, at 1123.

<sup>272</sup> See *Defenders of Wildlife v. Andrus*, 428 F. Supp. 167, 170 (D.D.C. 1977) ("the agency has an affirmative duty to increase the population of protected species."). See also *Connor v. Andrus*, 453 F. Supp. 1037, 1041 (W.D. Tex. 1978) ("FWS has an affirmative duty to bring endangered species to the point at which they may be removed from protected status.").

<sup>273</sup> See Ruhl, *Section 7(a)(1)*, *supra* note 267, at 1125-35.

<sup>274</sup> See *Carson Truckee Water Conservancy District v. Clark*, 741 F.2d 257 (9th Cir. 1984), *cert. denied* 470 U.S. 1083 (1985).

<sup>275</sup> See *Pyramid Lake Tribe of Indians v. United States Dep't of Navy*, 898 F.2d 1410 (9th Cir. 1990). See also *Platte River Whooping Crane Critical Habitat Maintenance Trust v. F.E.R.C.*, 962 F.2d 27 (D.C. Cir. 1992), *reh'g denied*, 972 F.2d 1362 (1992).

imposed by section 7(a)(1); if harm must be shown, then the duty is reactive, not affirmative. A better reading of the provision is provided by the court in *Florida Key Deer v. Stickney*,<sup>276</sup> which held that the Federal Emergency Management Authority violated section 7(a)(2) because it "failed to consider or undertake *any* action to fulfill its mandatory obligations under section 7(a)(1)."<sup>277</sup>

## 2. The Consultation Requirement

Probably the best known provision of the ESA is section 7(a)(2), which imposes both procedural and substantive requirements on federal agencies.<sup>278</sup> Procedurally, section 7(a)(2) requires federal "action agencies" (e.g. BLM, FS, COE) to consult with the "wildlife agencies" (i.e. FWS or NMFS, depending on the affected species) on "actions authorized, funded, or carried out" by such agencies that "may affect" a listed species.<sup>279</sup> The purpose of such consultation is to "insure" that federal actions "[are] not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification" of any designated critical habitat.<sup>280</sup> The product of the consultation process is a "biological opinion" written by the appropriate wildlife agency, which evaluates the impacts on listed species.<sup>281</sup> If the conclusion of the biological opinion is that the responsible agency cannot insure that its action is not likely to jeopardize the affected species or modify any designated critical habitat, then the wildlife agency must recommend whatever "reasonable and prudent alternatives" may exist that would avoid jeopardy.<sup>282</sup>

Much ink has been spilled over the consultation process.<sup>283</sup> Critics charge that it takes too long, is too expensive, and stops or impedes important projects.<sup>284</sup> Other knowledgeable commentators counter that the

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<sup>276</sup> 864 F. Supp. 1222 (S.D. Fla. 1994).

<sup>277</sup> *Id.* at 1228 (emphasis in original).

<sup>278</sup> See 16 U.S.C. § 1536(a)(2) (1994).

<sup>279</sup> See *id.*

<sup>280</sup> *Id.*

<sup>281</sup> See *id.* § 1536(b)(3)(A).

<sup>282</sup> See *id.* § 1536(b)(4).

<sup>283</sup> See, e.g., ROHLF, *supra* note 243, at 105-171; Houck, *supra* note 234, at 315-26; BEAN & ROWLAND, *supra* note 14, at 239-51.

<sup>284</sup> See, e.g., Stuart L. Somach, *What Outrages Me About The Endangered Species Act*, 24 ENVTL. L. 801 (1994).

process promotes intelligent planning, rarely stops projects, and prevents unnecessary habitat loss.<sup>285</sup> The available data seems to support the view that, while it could stand some improvement (what process could not?), the consultation process seems to work reasonably well, if judged by the objective of reducing impacts on endangered species through better project design and construction.<sup>286</sup>

### 3. *The Jeopardy Prohibition*

As mentioned, section 7(a)(2) also contains a substantive requirement that federal agencies “insure” that their actions are not likely to jeopardize the continued existence of listed species or adversely modify designated critical habitat.<sup>287</sup> This is the duty that, in the words of the United States Supreme Court, “admits of no exception,”<sup>288</sup> requiring courts to enjoin violations of section 7(a)(2) without regard to countervailing equities or public purposes.<sup>289</sup> Indeed, section 7(a)(2) may be the only provision in all of environmental law that imposes this kind of absolute compliance obligation.<sup>290</sup> The only escape from this jeopardy prohibition is the exemption process, added by Congress in 1978 to deal with the Supreme Court’s Tellico Dam decision.<sup>291</sup> Remarkably, only three exemption decisions have been made by the Endangered Species Committee (the “God Squad”) in the twenty years that the process has been available.<sup>292</sup>

So potent is the jeopardy prohibition, in fact, that it is rarely invoked.<sup>293</sup> Out of approximately 100,000 consultations between 1987 and

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<sup>285</sup> See, e.g., Houck, *supra* note 234, at 321.

<sup>286</sup> See generally GAO REPORT, *supra* note 237. See also DONALD BERRY ET AL., WORLD WILDLIFE FUND, FOR CONSERVING LISTED SPECIES, TALK IS CHEAPER THAN WE THINK: THE CONSULTATION PROCESS UNDER THE ENDANGERED SPECIES ACT 4-10 (1992) (discussing the consultation process of Section 7 of the Endangered Species Act as it affects the United States based on a study conducted by the World Wildlife Fund).

<sup>287</sup> See 16 U.S.C. § 1536(a)(2).

<sup>288</sup> Tennessee Valley Authority v. Hill, 437 U.S. 153, 173 (1978).

<sup>289</sup> “[N]either the ESA nor the Constitution provides federal courts with authority to make such fine utilitarian calculations.” *Id.* at 186.

<sup>290</sup> See Zygmunt Plater, *Statutory Violations And Equitable Discretion*, 70 CALIF. L. REV. 524, 545-56 (1982).

<sup>291</sup> See 16 U.S.C. § 1536(c).

<sup>292</sup> See Houck, *supra* note 234, at 329.

<sup>293</sup> See *id.* at 322.

1992, only twenty-seven jeopardy opinions were issued.<sup>294</sup> A major reason for this is the crabbed definition of jeopardy adopted by the wildlife agencies. In the regulations implementing section 7, jeopardy is defined to mean "action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of *both* the survival and recovery of a listed species in the wild."<sup>295</sup> The word "both" was added in 1986 when James Watt, President Reagan's controversial Interior Secretary, ordered revision of the Section 7 regulations.<sup>296</sup> The preamble to the revised rule makes it clear that the intent behind the change was to require a stronger showing of harm to a species to meet the jeopardy standard.<sup>297</sup> Thus, unless an action threatens the survival of a listed species, it does not satisfy the jeopardy standard, even if it impedes recovery.<sup>298</sup> Even though this distinction between survival and recovery lacks scientific merit, courts have nevertheless required a showing that an action actually threatens the extinction of a species.<sup>299</sup> Had the agencies chosen to frame the standard in the disjunctive, i.e., survival *or* recovery, the jeopardy prohibition could have put some real teeth in the recovery process. Such an interpretation would have been eminently reasonable given the ordinary meaning of the term "jeopardize,"<sup>300</sup> especially when read in light of the remedial purposes of the ESA,<sup>301</sup> and would have stood a good chance of being upheld under *Chevron*, which called for judicial deference to agency interpretations.<sup>302</sup>

But the politics of the ESA pushed the wildlife agencies towards a

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<sup>294</sup> See generally GAO REPORT, *supra* note 237. GAO found that over 90% of formal consultations resulted in "no jeopardy" determinations, and that "reasonable and prudent alternatives" were recommended in 90% of the cases where jeopardy was found. See *id.*

<sup>295</sup> 50 C.F.R. § 402.02 (1997) (emphasis added).

<sup>296</sup> See Joint Regulations on Endangered Species, 51 Fed. Reg. 19,926 (1986) (to be codified at 50 C.F.R. pt. 402).

<sup>297</sup> See *id.* at 19,334.

<sup>298</sup> See Houck, *supra* note 234, at 322-23.

<sup>299</sup> See, e.g., Idaho Dep't of Fish and Game v. National Marine Fisheries Serv., 850 F. Supp. 886 (D. Or. 1994).

<sup>300</sup> Webster's defines "jeopardize" as "to expose to danger (as of imminent loss, defeat or serious harm)." WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 1213 (1981). Activities shown to reduce a species chances for recovery would certainly meet this definition.

<sup>301</sup> See Tennessee Valley Authority v. Hill, 437 U.S. 153, 175 (1978).

<sup>302</sup> See *Chevron U.S.A. Inc. v. Natural Resources Defense Council*, 467 U.S. 837 (1984) (holding that courts should give words their ordinary meaning unless Congress specifies an alternative meaning; and that courts must defer to an agency's reasonable interpretation of an ambiguous statute, taking into account the purpose of the law).

reductionist, bare survival, standard of jeopardy.<sup>303</sup> And, with few exceptions, that is the way the program has been administered for the past twenty years. Given the relentless political attacks on the statute, it is not surprising that the agencies have shied away from jeopardy showdowns. In the Reagan-Bush years, the people put in charge of the program were openly hostile to it.<sup>304</sup> The Clinton Administration is certainly more sympathetic to the Act's objectives, but, as discussed in Part VI below, its attempt to save the law by making it more "user-friendly" may simply render it toothless as well as penniless.

#### 4. *The Take Prohibition*

Even more potent and controversial than the jeopardy prohibition is the ESA's broad-scale prohibition on "take." Section 9 of the Act makes it unlawful for "any person" to "take" any endangered species of fish or wildlife.<sup>305</sup> The Act defines "take" to mean "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct."<sup>306</sup> The term "harm" is further defined by regulation to include "significant habitat modification or degradation that actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering."<sup>307</sup> The harm rule has been enforced in a number of cases brought by citizens to halt habitat destruction on public and private lands.<sup>308</sup> In 1995, to the surprise of many, the U.S. Supreme Court upheld the harm rule in the

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<sup>303</sup> See Houck, *supra* note 234, at 326 ("Taken together, Interior's regulations present a composite picture of an agency doing everything possible within the law, and beyond, to limit the effect of protection under 7(a)(2).").

<sup>304</sup> The Secretaries of Interior were, in order of succession, James Watt (who explained to this author that the reason he had declared a moratorium on new listings was "[w]e already have enough endangered species."); Don Hodel (who prescribed hats and sunglasses to combat ultraviolet radiation from ozone depletion); and Manuel Lujan (who once asked, "[h]ow many squirrels do we need anyway?"). See also John Lancaster, *Lujan: Endangered Species Act Too Tough, Needs Changes*, WASH. POST, May 12, 1990, at A1 (describing Secretary Lujan's desire to weaken the Act to promote development).

<sup>305</sup> See 16 U.S.C. § 1539(a)(1) (1994).

<sup>306</sup> *Id.* § 1532(19).

<sup>307</sup> 50 C.F.R. § 17.31 (1998).

<sup>308</sup> See Houck, *supra* note 234, at 327-28. See generally Albert Gidari, *The Endangered Species Act: Impact of Section 9 on Private Landowners*, 24 ENVTL. L. 419 (1994) (discussing numerous section 9 cases, many of which were citizen suits).

*Sweet Home* case.<sup>309</sup>

For several reasons, the take prohibition, especially as applied through the harm rule, has become the lightening rod in the debate over the future of the ESA. First, unlike section 7, which applies only to the federal government, the section 9 take prohibition applies to "any person," including private property owners, which implicates Fifth Amendment regulatory takings considerations.<sup>310</sup> Second, the take prohibition is much broader than the jeopardy prohibition: the harassment of a single member of a species can be a violation.<sup>311</sup> Third, there are criminal sanctions for a "knowing" violation of the take prohibition.<sup>312</sup> Finally, and perhaps most importantly, over ninety percent of listed species in the United States have some of their habitat on non-federal lands,<sup>313</sup> and about thirty-seven percent of all listed species are found exclusively on such lands.<sup>314</sup>

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<sup>309</sup> See *Babbitt v. Sweet Home Chapter of Communities for a Greater Oregon*, 515 U.S. 687 (1995). The *Sweet Home* decision left the hard question of when habitat modification "actually kills or injures" a protected species to a case by case determination. Justice O'Connor, in a concurring opinion, expressed the view that habitat modification must be proven to be the proximate cause of the death of or injury to a specific individual member of the species. See *id.* at 709. Whether this becomes the standard that the majority of lower courts will apply remains an open question, but the Ninth Circuit has already rejected O'Connor's proximate cause requirement. See *Marbled Murrelet v. Babbitt*, 83 F.3d 1060, 1067 (9th Cir. 1996) (holding that a "threat of future harm" was sufficient to prove a violation of section 9).

<sup>310</sup> Compare Barton H. Thompson, Jr., *The Endangered Species Act: A Case Study in Takings and Incentives*, 49 STAN. L. REV. 305 (1991) (advocating at least partial compensation for "regulatory takings"), with Patrick Parenteau, *Who's Taking What? Property Rights, Endangered Species, and the Constitution*, 6 FORDHAM ENVTL. L.J. 619 (1995) (explaining that ESA has built-in mechanisms to avoid actually taking private property).

<sup>311</sup> See 50 C.F.R. § 17.21.

<sup>312</sup> See 16 U.S.C. § 1540(b). See also BEAN & ROWLAND, *supra* note 14, at 227-28 (discussing criminal and civil penalties for knowing violations). The ESA may fall into the category of a "public welfare" statute, meaning that the scienter requirement for criminal offense is the more liberal general intent standard. Thus, "knowing" may refer to knowledge of the facts, not the law. In other words if a person knows that an action is likely to impact the protected species, he or she is culpable notwithstanding a lack of knowledge that it is illegal to harm the species. See Richard J. Lazarus, *Mens Rea in Environmental Criminal Law: Reading the Supreme Court Tea Leaves*, 7 FORDHAM ENVTL. L.J. 861, 873 (1996) (relying on Official Transcript of the Oral Argument at 4-7, *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon*, 515 U.S. 687 (1995)).

<sup>313</sup> See REBUILDING THE ARK, *supra* note 192, at 3.

<sup>314</sup> See UNITED STATES GENERAL ACCOUNTING OFFICE, INFORMATION ON SPECIES PROTECTION ON NON-FEDERAL LANDS 5 tbl.1 (1994).

Congress responded to landowner concerns over potential liability for taking a protected species in the conduct of "otherwise lawful activity,"<sup>315</sup> by amending the ESA in 1982 to add a special provision, section 10, authorizing the Secretary to issue an "incidental take permit" (ITP) to allow a limited take of species subject to certain conditions.<sup>316</sup> First, the take must "not appreciably reduce the likelihood of the survival and recovery of the species in the wild."<sup>317</sup> Second, the applicant must submit a habitat conservation plan (HCP) demonstrating how the applicant will "to the maximum extent practicable, minimize and mitigate the impacts of such permitted taking."<sup>318</sup> The original model for the HCP requirement was the San Bruno Plan in Northern California, involving the Mission Blue Butterflies and Callippe Silverspot.<sup>319</sup> The San Bruno Plan set a very high standard for HCPs, calling for a reserve that set aside approximately ninety percent of the butterflies' habitat,<sup>320</sup> and including a revocation provision in the event the scientific assumptions proved incorrect.<sup>321</sup>

Perhaps because of this high standard, the costs involved, and the uncertainty of the process, very few HCPs were submitted in the first ten years of the program. Since the early 1990's, however, and particularly since the 1994 mid-term elections, there has been an explosion of HCPs and ITPs.<sup>322</sup> And the biggest promoter of HCPs is none other than Secretary Babbitt. As described below in Part VI, the HCP program is now at the center of the controversy over the future direction of the

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<sup>315</sup> 16 U.S.C. § 1539(a)(1)(B).

<sup>316</sup> See Endangered Species Act Amendments of 1982 § 10(a), Pub. L. No. 97-304, 96 Stat. 1422-24 (codified as amended at 16 U.S.C. § 1539(a) (1994)).

<sup>317</sup> 16 U.S.C. § 1539(a)(2)(e)(iv).

<sup>318</sup> *Id.* § 1539(a).

<sup>319</sup> See Robert D. Thornton, *Searching For Consensus And Predictability: Habitat Conservation Planning Under The Endangered Species Act of 1973*, 21 ENVTL. L. 605, 626 (1991).

<sup>320</sup> SAN BRUNO MOUNTAIN AREA HABITAT CONSERVATION PLAN (1982), cited and described in MICHAEL J. BEAN ET AL., RECONCILING CONFLICTS UNDER THE ESA: THE HABITAT CONSERVATION PLANNING EXPERIENCE 52 (1991).

<sup>321</sup> See Thornton, *supra* note 319, at 622.

<sup>322</sup> See generally Kostyack, *supra* note 205. The author notes that only 14 HCPs had been developed by the end of the Bush Administration, whereas today there are more than 400 plans in effect or under development. Kostyack recommends six changes in the current policy: performance standards based on recovery goals; stronger monitoring requirements; more specific adaptive management strategies; limits on the duration of assurances to landowners; improved enforcement mechanisms; and greater opportunities for public participation. See *id.*



ESA.<sup>323</sup>

To summarize Part III, the ESA is little more than a finger in the dike when it comes to the loss of biodiversity. The Act contains some potentially strong requirements for species and habitat protection, but they have been watered down by administrative practice, and they have become the target of a more conservative Congress.<sup>324</sup> The Act contains no mechanisms to provide economic incentives to landowners, and the funding that has been provided for recovery has been minuscule.<sup>325</sup> Thus the ESA has become hamstrung by, on the one hand, the agencies' reluctance to use the enforcement authority it does provide; and, on the other hand, the lack of any meaningful incentives to induce voluntary compliance.

Given these shortcomings, it is surprising that the Act has managed to accomplish anything at all, but in fact it has had some fairly impressive successes.

#### IV. WHAT THE ESA HAS ACCOMPLISHED

Twenty five years ago, the nation's symbol, the bald eagle, appeared headed for extinction in the contiguous United States.<sup>326</sup> Today, the eagle has recovered to the point that it is being considered for delisting.<sup>327</sup> The American alligator, almost wiped out by poachers, has been delisted and is once again so numerous that it is regarded as a nuisance, and a threat to unattended pets, in many parts of the South.<sup>328</sup> The whooping crane, once down to twenty, now has a population of about 200 birds in the wild and 200 in captive breeding populations.<sup>329</sup> The gray wolf, extirpated from most of its range, has been reintroduced to the Yellowstone ecosystem, and is being considered for delisting in the Upper Midwest;<sup>330</sup> and the red wolf has been reintroduced in North Carolina and

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<sup>323</sup> See *infra* notes 326 to 357 and accompanying text.

<sup>324</sup> See *supra* notes 219 to 325 and accompanying text.

<sup>325</sup> See *supra* notes 246 to 251 and accompanying text.

<sup>326</sup> In 1974, only 791 nesting pairs of bald eagles remained in the 48 contiguous states. See Watkins, *supra* note 248, at 40.

<sup>327</sup> See *id.*

<sup>328</sup> See Jim Tunstall, *Use Caution, Commonsense Near Alligators*, TAMPA TRIB., Sept. 20, 1998, at 1.

<sup>329</sup> See Brad Knickerbocker, *Saving Species, Ruffling Some Feathers*, CHRISTIAN SCI. MONITOR, Dec. 31, 1998, at 3.

<sup>330</sup> The Yellowstone wolf reintroduction has been a biological success, but is currently

in the desert southwest.<sup>331</sup> The grizzly bear population has remained fairly stable despite continuing loss of habitat and deadly encounters with humans.<sup>332</sup> The California condor would likely be extinct but for the extraordinary efforts made to capture and breed the last few wild birds.<sup>333</sup>

The ESA has been instrumental in bringing about larger scale changes as well. But for the ESA, the old growth forests of the Pacific Northwest would be all but gone by now;<sup>334</sup> but for the ESA, there would be no agreement to restore water quality in the Sacramento-San Joaquin Delta;<sup>335</sup> but for the ESA, there would be no NCCP in Southern California seeking to conserve the last of the coastal sage scrub community,<sup>336</sup> but for the ESA, there would be no Balcones Canyonlands HCP trying to save some of the natural areas around Austin, Texas;<sup>337</sup> but for the ESA, Hawaii might have lost another endemic species (the Palila) to an exotic (the Mouflon sheep);<sup>338</sup> but for the ESA, the few patches of long-leaf pine forest habitat of the red-cockaded woodpecker would be even smaller and more isolated.<sup>339</sup> Without the ESA, in short, things for biodiversity would be even grimmer than they are.

Nevertheless, the overall track record of the ESA is disappointing. The official scorecard looks like this:

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under a legal cloud as a result of the legal ruling in *Wyoming Farm Bureau Federation v. Babbitt*, 987 F. Supp. 1349 (D. Wyo. 1997) (holding that the reintroduction program violated the ESA). The District Court held that the designation of the Yellowstone pack as a “nonessential experimental” population was illegal because the introduced wolves are not geographically isolated from wild wolves which may be recolonizing the area. *See id.* at 1374. The District Court ordered removal of the introduced wolves, but stayed its order pending resolution of the government’s appeal to the Tenth Circuit. *See id.* at 1376.

<sup>331</sup> *See* Watkins, *supra* note 248, at 42.

<sup>332</sup> *See id.*

<sup>333</sup> *See* United States Fish and Wildlife Serv., *Endangered Species Box Score* (last visited Aug. 31, 1998) <<http://www.fws.gov/r9erdspp/boxtbl.html>> [hereinafter *Box Score*].

<sup>334</sup> *See* DIETRICH, *supra* note 90, at 78, 213.

<sup>335</sup> *See id.*

<sup>336</sup> *See* Oliver A. Houck, *On the Law of Biodiversity*, 81 MINN. L. REV. 869, 960-65 (1997) [hereinafter Houck, *Biodiversity*].

<sup>337</sup> *But see* Ruhl, *Section 7(a)(1)*, *supra* note 267, at 1413-23 (standing for the proposition that although the Balcones Canyonlands HCP has been possible because of the ESA, it has been extremely costly and largely unsuccessful).

<sup>338</sup> *See* Cheever, *supra* note 246, at 45.

<sup>339</sup> *See id.* at 30.

### A. Listings

As of May, 1998, there were 1143 domestic species on the combined list (469 animals, 675 plants).<sup>340</sup> Another two hundred or so are considered eligible for listing but are stuck in the agency's bottleneck.<sup>341</sup> Several thousand more languish as potentially eligible for listing but require further study.<sup>342</sup> Many of these species may be gone by the time the bureaucracy gets around to them.<sup>343</sup>

### B. Critical Habitat Designations

As mentioned above, critical habitat has been designated for about one-fifth of listed species,<sup>344</sup> and most of that was designated before the 1978 ESA Amendments<sup>345</sup> which made the designation process more cumbersome and difficult.<sup>346</sup> There have been frequent calls to repeal the critical habitat designation provision.<sup>347</sup> Some argue that it adds nothing to the jeopardy prohibition.<sup>348</sup> In its report to Congress, however, the National Research Council recommended retaining the concept and adding a special category of "survival habitat" to be designated at the time of listing without the requirement for economic analysis.<sup>349</sup> Moreover, from an enforcement standpoint it is often easier to prove that an activity will adversely modify critical habitat than it is to prove that it will jeopardize the survival of the entire species.<sup>350</sup> Even FWS acknowledges that the

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<sup>340</sup> See *Box Score*, *supra* note 333.

<sup>341</sup> See Review of Plant and Animal Taxa that are Candidates or Proposed for Listing as Endangered or Threatened, 62 Fed. Reg. 49,398 (1997).

<sup>342</sup> See Houck, *supra* note 234, at 292.

<sup>343</sup> See *id.* at 292-293.

<sup>344</sup> See GAO REPORT, *supra* note 237 and accompanying text.

<sup>345</sup> See Endangered Species Act Amendments of 1978, Pub. L. No. 95-632, 92 Stat. 3751 (codified as amended at 16 U.S.C. §§ 1532-1536, 1538-1540, 1542 (1994)).

<sup>346</sup> See GAO REPORT, *supra* note 237, at 26.

<sup>347</sup> See Saltzman, *supra* note 232, at 335-38.

<sup>348</sup> See *id.*

<sup>349</sup> NRC REPORT, *supra* note 22, at 17.

<sup>350</sup> See Houck, *supra* note 234, at 296-307. This author has had first hand experience using a critical habitat designation for the whooping crane on the Platte River in Nebraska to win a lawsuit (the Grayrocks case) challenging upstream water diversions on the theory that the cumulative loss of stream flow was altering the physical characteristics of the river channel, and thereby adversely modifying the habitat. See *Nebraska v. Rural Electrification Admin.*, 12 F.E.R.C. 1156 (D. Neb. 1978). Without the critical habitat designation it would have been extremely difficult, perhaps impossible, to

critical habitat standard provides more protection, and does more to promote recovery, than does the jeopardy prohibition.<sup>351</sup>

### C. Recovery

According to FWS data, more species are declining than are improving.<sup>352</sup> In fact, as of 1993, more listed species have gone extinct (seven) than have fully recovered (five).<sup>353</sup> These are discouraging statistics in the abstract, but it must be remembered that these species were in bad shape when they were listed (in fact some were very nearly extinct)<sup>354</sup> and recovery takes a long time.<sup>355</sup> The good news is that listing does make a difference and designation of critical habitat does make a difference.<sup>356</sup> And most importantly, preparation and implementation of a recovery plan makes a big difference in the prospects for recovery of these species.<sup>357</sup> In short the data shows that the Act does work.<sup>358</sup> No doubt it would work even better with adequate funding, less political interference, and more vigorous enforcement. But there is also no doubt that the ESA needs more effective tools, and specifically more carrots, to achieve recovery more quickly.

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convince the court that these diversions jeopardized the survival of the Whooper, given that the Platte was migratory habitat and not the Whooper's breeding or wintering grounds.

<sup>351</sup> In the rule designating critical habitat for the northern spotted owl, FWS stated: "The Act's definition of critical habitat indicates that the purpose of critical habitat is to contribute to a species' conservation, which by definition equates to recovery . . . [T]he adverse modification standard may be reached closer to the recovery end of the survival continuum, whereas, the jeopardy standard traditionally has been applied nearer to the extinction end of the continuum." 57 Fed. Reg. 1792, 1822 (1992).

<sup>352</sup> See NRC REPORT, *supra* note 24, at 197; REBUILDING THE ARK, *supra* note 193, at 2 fig.2, 4 fig.4a & 4b.

<sup>353</sup> See MANN & PLUMMER, *supra* note 91, at 240.

<sup>354</sup> Studies show that the median population of species at the time of listing is 407. See CRS REPORT, *supra* note 253, at 3.

<sup>355</sup> See Jeffrey J. Rachlinski, *Noah by the Numbers: An Empirical Evaluation of the Endangered Species Act*, 82 CORNELL L. REV. 356, 388 (1997). Professor Rachlinski concludes, "The data presented here refute the underlying premise of Mann and Plummer's proposals: that the Act is an outright failure as it stands."

<sup>356</sup> See *id.* at 384.

<sup>357</sup> See *id.* ("[R]ecovery plans appeared to be the primary mechanism that set species on the road to recovery.").

<sup>358</sup> See *id.* at 383 ("The data clearly demonstrates that endangered and threatened species are better off with the Act than they would be without it.").

## V. MAJOR CRITICISMS OF THE ESA

Nobody is happy with the ESA. Supporters want stronger habitat protection and speedier recovery; opponents want less regulation and more protection for landowners; middle-of-the-roaders want more "balance."<sup>359</sup> Following is a brief commentary on some of the major criticisms.

A. *The Act Kicks in Too Late*

It is true that the Act usually does not kick in until a species has declined to the point where heroic efforts are often needed to rescue it.<sup>360</sup> However, it would require a whole new approach to the biodiversity problem, a true ecosystems protection law, to address the prevention issue. Whether such a law can even be designed, much less enacted, is problematic.<sup>361</sup> In the meantime, one device being tried as an early intervention measure is the "candidate conservation agreement," discussed in Part VI below, under which landowners, and in some cases states and tribes, agree to take conservation measures in exchange for FWS agreeing not to list the species.<sup>362</sup> On the surface this approach seems appealing, but it assumes that the agreements will in fact result in species improving to the point where listing is not necessary. If the agreements are based on sound biology, set enforceable performance standards, adequately provide for contingencies, and make sure there is a safety net under the species, then they could be useful tools. If they become just another "user-friendly" device to accommodate development they risk failure, and the listing will simply be postponed to a time when recovery may be more

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<sup>359</sup> See J. B. Ruhl, *Who Needs Congress? An Agenda for Administrative Reform of the Endangered Species Act*, 6 N.Y.U. ENVTL. L. REV. 367, 370-371 (1998) [hereinafter Ruhl, *Who Needs Congress?*]. The concept of balance, like sustainable development, is in the eye of the beholder. See *id.* It is doubtful that Reed Noss, the biologist, and Ross Perot, the billionaire developer, see the same things when they look at the Balcones Canyonlands country around Austin, Texas. What Noss may see as yet another ecosystem unraveling under the pressures of sprawl, Perot apparently sees as just another opportunity to make a killing in the real estate market. See generally MANN & PLUMMER, *supra* note 91, at 196-97.

<sup>360</sup> See John C. Kunich, *The Fallacy of Deathbed Conservation Under the Endangered Species Act*, 24 ENVTL. L. 501, 550-52 (1994).

<sup>361</sup> See Ruhl, *Who Needs Congress?*, *supra* note 359, at 369-72.

<sup>362</sup> See UNITED STATES FISH AND WILDLIFE SERVICE, ENDANGERED SPECIES PROGRAM: CANDIDATE SPECIES GUIDE (Draft 1994).

difficult and the conflicts more intense.

Even before their ecological merits can be assessed these agreements must overcome serious legal questions. Courts have not been very friendly to the concept of deferring listings on the basis of prospective measures and government promises of improved conservation efforts.<sup>363</sup> The courts have pointed to the strict language of section 4 of the ESA requiring that listings be made “solely on the basis of the best scientific and commercial data available,” not on what might happen in the future.<sup>364</sup>

*B. The Act's Single Species Focus is Too Narrow; It Ought to Take an "Ecosystems Management" Approach*

It is true that the ESA has historically taken a species by species approach; however, of late there has been a more concerted and somewhat successful effort to conduct multi-species planning on a regional scale.<sup>365</sup> The Natural Communities Conservation Plan (NCCP) in Southern California and the Balcones Canyonlands Plan outside Austin, Texas, are two examples of this broader approach.<sup>366</sup> Ecosystem management might sound good, but it is an elusive concept, meaning different things to different people.<sup>367</sup> According to the Forest Service, for example,

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<sup>363</sup> See Ruhl, *Who Needs Congress?*, *supra* note 359, at 387.

<sup>364</sup> See 16 U.S.C. § 1433(b)(1)(A); *Oregon Natural Resources Council v. Daley*, 6 F. Supp.2d 1139, 1143 (D. Or. 1998); *Friends of the Wild Swan v. United States Fish and Wildlife Serv.*, 945 F. Supp. 1388, 1398 (D. Or. 1996); *Biodiversity Legal Found. v. Babbitt*, 943 F. Supp. 23, 25-26 (D.D.C. 1996); *Southwest Ctr. for Biological Diversity v. Babbitt*, 939 F. Supp. 49, 52 (D.D.C. 1996).

<sup>365</sup> See generally TIMOTHY BEATLEY, *HABITAT CONSERVATION PLANNING: ENDANGERED SPECIES AND URBAN GROWTH* (1996) [hereinafter BEATLEY, *HABITAT CONSERVATION PLANNING*]; Albert C. Lin, *Participants' Experiences With Habitat Conservation Plans and Suggestions for Streamlining the Process*, 23 *ECOLOGY L.Q.* 369 (1996); U.S. FISH AND WILDLIFE SERV. & NATIONAL MARINE FISHERIES SERV., *HABITAT CONSERVATION PLANNING HANDBOOK* 1-14 (Nov. 1996) [hereinafter HCP HANDBOOK].

<sup>366</sup> The Balcones Canyonlands Conservation Plan (BCCP) is described in BEATLEY, *supra* note 365, at 173-93. The NCCP is described in Houck, *Biodiversity*, *supra* note 336.

<sup>367</sup> For an excellent discussion of the difficulty of translating the holistic concepts of ecosystem management into “law to apply,” see generally Houck, *Biodiversity*, *supra* note 336 (arguing that “ecosystem management” is too vague a concept to serve as a useful model for species protection). Professor Houck prefers the indicator species approach, with specific, enforceable standards (i.e. “law to apply”). See *id.* at 974-78. I would agree that we have no business trying to manage ecosystems as if they were a

ecosystem management apparently means whatever the agency says it means: it all depends on what "indicator species" are chosen.<sup>368</sup> According to the Plum Creek Timber Company, ecosystem management just happens to fit nicely with its plans for liquidating large areas of old growth forests in the Northwest.<sup>369</sup>

Perhaps the question is not whether humans ought to try to "manage" the ecosystem, but whether we can figure out how to manage ourselves in such a way as to reduce our collective, negative influence on natural processes. The notion that we are smart enough to manage ecosystems flies in the face of how little we know about them. To paraphrase Aldo Leopold, ecosystems are not only more complex than we think, they are more complex than we *can* think.<sup>370</sup> The human challenge is to use our big brains to think up economic systems that function in harmony with ecological processes, that reduce resource consumption, prevent pollution, and conserve natural capital, in short, that respect the land. One need not subscribe to doomsday theories of total environmental collapse to question whether a world of vanishing species, unraveling ecosystems, and deteriorating environmental conditions is really a world we want to inhabit, or bequeath to our children.

### C. *The Act Fails to Take Economics into Account in Making Listing Decisions*

It is true, as already discussed, that listings are based solely on

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human invention; however, there is no reason why we cannot use an ecosystems *approach* to design conservation programs, which, if done properly, must incorporate indicator species as a management tool. No matter what we call it, our approach to biodiversity conservation is going to need a lot better legal and policy instruments than are currently in play. For a conservation biologist's point of view, see R. Edward Grumbine, *Reflections on What is Ecosystem Management?*, 11 CONSERVATION BIOLOGY 41 (1997). For a perspective on how landowners view the concept, see Rebecca W. Thompson, *Ecosystem Management: Great Idea, But What Is It, Will It Work, and Who Will Pay?*, NAT. RESOURCES & ENV'T., Winter 1995, at 43.

<sup>368</sup> See *Sierra Club v. Marita*, 46 F.3d 606, 620-21 (7th Cir. 1995) (holding that the Forest Service was not required to follow the principles of conservation biology in managing the National Forests); Walter J. Kuhlman, *Wildlife's Burden*, in BIODIVERSITY AND THE LAW 180 (William J. Snape III, ed., 1996).

<sup>369</sup> See DEFENDERS OF WILDLIFE, FRAYED SAFETY NETS: CONSERVATION PLANNING UNDER THE ENDANGERED SPECIES ACT 97-98 (1998) [hereinafter FRAYED SAFETY NETS].

<sup>370</sup> See Aldo Leopold, *A Biotic View of Land* [1939], in THE RIVER OF THE MOTHER OF GOD 266, 266-70 (Susan L. Flader & J. Baird Callicott eds., 1991).

scientific evidence. Critics claim this is misguided because the decision to protect species carries with it potentially significant economic consequences.<sup>371</sup> Presumably, this criticism is based on a belief that some species are not worth saving and that economics can tell us which ones are and which are not. However, as discussed above, economic theory is not quite up to the task.<sup>372</sup>

Moreover, it is not realistic to count on there being sufficient information available at the listing stage to make even an educated guess about the costs and benefits of the listing. For example, it will rarely be possible to predict precisely what kinds of activities will be affected by the listing or whether the net effect of curtailing such activities will be positive or negative from the standpoint of the overall economy. In the case of the spotted owl, for example, the logging of old growth watersheds has had profoundly negative economic consequences for the Northwest salmon fisheries and economists have only recently been able to quantify the economic benefits of conserving the last of the old growth forest.<sup>373</sup>

#### D. *The Act Creates Perverse Incentives to Destroy Habitat*

No doubt some landowners are motivated to destroy habitat before it becomes "infest[ed]" with an endangered species.<sup>374</sup> Ross Perot is reported to have done this on land owned by one of his companies outside Austin, Texas, to prevent occupancy by the golden cheeked warbler and black-capped vireo, two threatened species involved in the Balcones Canyonlands Conservation Plan.<sup>375</sup> And there probably are individuals who would rather violate the ESA, to "shoot, shovel, and shut up," than submit to its restrictions. But the available data does not support the sweeping claim that species are more at risk on private lands than on public lands due to the take prohibition:<sup>376</sup> in fact, the data cuts in the opposite direction.<sup>377</sup> Moreover without the take prohibition there undoubtedly would be few, if any, HCPs and regional planning efforts

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<sup>371</sup> See *supra* notes 171 to 178 and accompanying text.

<sup>372</sup> See *supra* notes 132 to 135 and accompanying text.

<sup>373</sup> See generally David Seidman, *Out of the Woods*, AUDUBON, July-Aug., 1996, at 66.

<sup>374</sup> MANN & PLUMMER, *supra* note 91, at 196-97.

<sup>375</sup> See *id.*

<sup>376</sup> See Jeffrey J. Rachlinski, *Perverse Incentives in the Endangered Species Act: An Empirical Evaluation* (Dec. 1990) (unpublished manuscript, on file with the author).

<sup>377</sup> See *id.*



such as the NCCP, noted above.<sup>378</sup> Nevertheless, there is widespread agreement that the ESA would have more success if it provided some carrots to go with its sticks.<sup>379</sup> The question is what kinds of incentives and how they should be funded. As mentioned, one way to accomplish this is to start shifting tax and fiscal policies away from habitat destruction and towards habitat conservation.<sup>380</sup> No one underestimates the political obstacles to accomplishing this, but it is nonetheless a worthwhile national goal that would serve a number of environmental, economic, and equity interests.

*E. The Act Imposes Unfair Burdens on Property Owners, Raising "Regulatory Takings" Concerns*

The doctrine of "regulatory taking," though of somewhat dubious historical origin,<sup>381</sup> is now firmly ensconced in constitutional jurisprudence.<sup>382</sup> In the immortal words of Justice Holmes, a regulation becomes a taking under the Fifth Amendment when it goes "too far."<sup>383</sup> Theoretically, government regulation on behalf of endangered species could at some point give rise to a successful takings claim. The remarkable thing is that it has not occurred in the twenty-five years the ESA has been on the books. One explanation may be that takings cases are expensive to litigate and tough to win.<sup>384</sup> Takings jurisprudence is

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<sup>378</sup> See Ruhl, *Who Needs Congress?*, *supra* note 359, at 1115-18; *supra* notes 365 to 367 and accompanying text.

<sup>379</sup> See THE KEYSTONE CENTER, FINAL REPORT: THE KEYSTONE DIALOGUE ON INCENTIVES FOR PRIVATE LANDOWNERS TO PROTECT ENDANGERED SPECIES 7 (1995) ("If landowners could have some assurance that activities they conduct now would not lead to prosecution under the ESA, they would be more willing to participate in activities to preserve habitat.").

<sup>380</sup> See *supra* notes 185 to 218 and accompanying text.

<sup>381</sup> See generally William Michael Treanor, *The Original Understanding Of The Takings Clause and the Political Process*, 95 COLUM. L. REV. 782 (1995). The author presents persuasive historical evidence that the founders intended the Fifth Amendment takings clause to apply only to physical takings (i.e. condemnations).

<sup>382</sup> See generally Joseph Sax, *Takings: Private Property and Public Rights*, 81 YALE L.J. 149 (1971); RICHARD A. EPSTEIN, *TAKINGS: PRIVATE PROPERTY AND THE POWER OF EMINENT DOMAIN* (1985); Carol M. Rose, *A Dozen Propositions on Private Property, Public Rights, and the New Takings Legislation*, 53 WASH. & LEE L. REV. 265 (1996).

<sup>383</sup> See *Pennsylvania Coal Company v. Mahon*, 260 U.S. 393, 415 (1922).

<sup>384</sup> Just getting into court is difficult given "ripeness" and other procedural hurdles. See *Williamson County Regional Planning Comm'n v. Hamilton Bank of Johnson City*, 473 U.S. 172, 186-91 (1985); *MacDonald, Sommer & Frates v. County of Yolo*, 477 U.S.

muddled,<sup>385</sup> and untangling it is well beyond the scope of this discussion, but in essence a property owner must prove that the regulation in question deprives the owner of all "economically viable use" of the property "as a whole."<sup>386</sup> The *Lucas* case tells us that a categorical taking occurs when the legislature passes a law that renders previously acquired property worthless.<sup>387</sup> *Lucas*, however, presented an unusual set of facts that limits its precedential significance.<sup>388</sup> In the more typical cases involving less than a total "wipeout," the Supreme Court applies a complicated three factor balancing test and outcomes are heavily fact-dependent.<sup>389</sup> Results often seem to depend on whether the Court views the nature of the regulation as preventing a harm or providing a benefit. For example, government may be given more leeway when regulating the discharge of pollutants than the filling of wetlands,<sup>390</sup> notwithstanding the fact that the

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340, 350-51, *reh'g denied* 478 U.S. 1035 (1986).

<sup>385</sup> See Carol M. Rose, Mahon *Reconsidered: Why the Takings Issue is Still a Muddle*, 57 S. CAL. L. REV. 561, 561-62 (1984).

<sup>386</sup> See, e.g., *Penn Cent. Transp. Co. v. New York City*, 438 U.S. 104, 124, 138, n.36 (1978); *Agins v. Tiburon*, 447 U.S. 255, 260 (1980); *Keystone Bituminous Coal Ass'n v. DeBenedictis*, 480 U.S. 470, 490 (1987) ("As the Court explained in *Goldblatt v. Hempstead*, 369 U.S. 590, 594]: 'Although a comparison of values before and after' a regulatory action 'is relevant, . . . it is by no means conclusive . . . .'").

<sup>387</sup> See *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003, 1019 (1992).

<sup>388</sup> Four facts make *Lucas* unique. First, the law prohibiting development was enacted after Mr. Lucas bought the property. Second, the purpose for which Mr. Lucas bought the property (i.e., construction of a residence) was not considered a "nuisance" under South Carolina law. Third, the original South Carolina statute did not provide any kind of waiver or variance provision. Finally, the parties stipulated that the economic value of the property with the development restriction was zero. See, e.g., Peter L. Henderer, *The Impact of Lucas v. South Carolina Coastal Council and the Logically Antecedent Question: A Practitioner's Guide to Fifth Amendment Takings of Wetlands*, 3 ENVTL. LAW. 407, (1997); Richard J. Lazarus, *Putting the Correct "Spin" on Lucas*, 45 STAN. L. REV. 1411 (1993); Joseph Sax, *Property Rights and the Economy of Nature: Understanding Lucas v. South Carolina Coastal Council*, 45 STAN. L. REV. 1433 (1993).

<sup>389</sup> Under the *Penn Central* test, for example, the Court looks at (1) the owner's reasonable, investment-backed expectations, (2) the nature of the government action, and (3) the diminution in market value (of the "property as a whole"). See *Penn Central Transp. Co.*, 438 U.S. at 124. Under this kind of multi-factor balancing approach, even a law that renders property valueless is not necessarily a taking. See also *Goldblatt v. Hempstead*, 369 U.S. 590, 596 (1962); *United States v. Caltex (Philippines) Inc.*, 344 U.S. 149, 155 (1952); *Hadacheck v. Sebastian*, 239 U.S. 394, 405 (1928); *Mugler v. Kansas*, 123 U.S. 623, 657 (1887).

<sup>390</sup> See, e.g., *Loveladies Harbors, Inc. v. United States*, 28 F.3d 1171, 1175, 1183 (Fed. Cir. 1994) (denial of permit to fill a wetland created a public benefit requiring compensation); *Florida Rock Indus., Inc. v. United States*, 21 Cl. Ct. 161, 175-76 (1990),

net result, namely water quality impairment, may be the same in either case.

Of course, government restrictions need not rise to the level of a constitutional violation in order to work a hardship on landowners. It may well be that, as a policy matter, it would be fairer, and more politic, to spread the costs of habitat conservation more broadly. However this just begs the question of who should pay, how much it will cost, and what kind of tax or other revenue enhancement Congress is willing to enact to fund landowner payments.

## VI. CLINTON ADMINISTRATION REFORMS

The 1994 mid-term elections, which swept Republicans into control of both Houses of Congress,<sup>391</sup> radically altered the political landscape of national environmental policy. In appreciation for leading them to victory, conservative Republicans elected Newt Gingrich (R. Ga.) Speaker of the House, and he quickly vowed to enact a program of legislative reforms embodied in the "Contract With America."<sup>392</sup> High on the list of environmental laws targeted for radical surgery was the ESA.

The Speaker signaled the direction he intended the ESA reauthorization to go by appointing Don Young (R. Ak.) Chair of the House Natural Resources Committee (which he quickly renamed the "Resources Committee").<sup>393</sup> Mr. Young in turn named Richard Pombo (R. Ca.) to head a special subcommittee to handle reauthorization of the ESA.<sup>394</sup> One would be hard pressed to find two members of Congress less friendly to the ESA.<sup>395</sup> Congressman Pombo scheduled a series of

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*vacated and remanded*, 18 F.3d 1560 (Fed. Cir. 1994).

<sup>391</sup> See *Shift of Loyalties: Political Realignment Examined in Historically Political Realignment: Past and Future*, SALT LAKE TRIB., Jan. 24, 1995, at Z2.

<sup>392</sup> The "Contract" called for, among other things, compensation for property owners burdened by government regulation to protect health and welfare, repeal of rules that do not pass a formal cost-benefit analysis, a ban on "unfunded federal mandates" for pollution control, and unspecified "regulatory reform measures." See generally, Victor B. Flatt, *Environmental 'Contraction' For America? (Or How I Stopped Worrying and Learned to Love the EPA)*, 29 LOY. L. A. L. REV. 585 (1996).

<sup>393</sup> See Scott Allen, *Speaking in Wildlife's Behalf Gingrich Intervenes in Debate Over Endangered Species*, BOSTON GLOBE, May 28, 1995, at 1.

<sup>394</sup> See *id.*

<sup>395</sup> The League of Conservation Voters, which evaluates the environmental voting records of members of Congress, gave Representatives Young and Pombo scores of 6 and 13 (on a scale of 100) respectively for 1997. See League of Conservation Voters, *National*

oversight and “field” hearings on the ESA which provided a friendly forum for everyone with a gripe against the law.<sup>396</sup> Newspapers from coast to coast carried “horror stories” of alleged ESA abuses, many of which proved to be inaccurate, exaggerated, or downright false.<sup>397</sup> Nevertheless, the momentum to repeal or weaken the law was building rapidly in Congress.

Faced with this new political reality, the Clinton Administration, led by Department of Interior Secretary Bruce Babbitt and his senior staff, decided to go on the offense by proposing a series of administrative reforms designed to improve the way the Act worked and to blunt some of the criticisms, while at the same time launching a major effort to get the word out about the Act’s accomplishments in the hope of rallying public support.<sup>398</sup>

Leading the attack on the ESA was the property rights movement backed by large corporate interests in the extractive industries (e.g., timber, mining) and real estate development community.<sup>399</sup> Since private lands play such an important role in maintaining the survival and recovery of listed species, and since landowner dissatisfaction was behind much of the anti-ESA feeling, the bulk of the administrative reforms were aimed at assuaging the concerns of private landowners.<sup>400</sup> “Fairness” became the watchword of the reform effort, as laid out in a 1995 DOI document entitled, *Protecting America’s Living Heritage: A Fair, Cooperative and Scientifically Sound Approach to Improving the Endangered Species Act*.<sup>401</sup> The document proposed a ten point plan (dubbed the “Ten Points of Light”) to improve the administration of the ESA through cooperation, negotiation and voluntary agreements,<sup>402</sup> as opposed to strict enforcement

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*Environmental Scorecards* (visited Jan. 14, 1999), <<http://www.lcv.org/scorecards/index.htm>>.

<sup>396</sup> See, e.g., Jane Kay, *On a Mission: Property Rights Advocate Finds Congress Niche*, CHI. TRIB., Nov. 18, 1995, at 17.

<sup>397</sup> See, e.g., Karin P. Sheldon, *Habitat Conservation Planning: Addressing the Achilles Heel of the Endangered Species Act*, 6 N.Y.U. ENVTL. L.J. 279, 279-80 (1998).

<sup>398</sup> See generally Babbitt, *supra* note 33.

<sup>399</sup> See Weston Kosava, *Ways to Skin the Act*, AUDUBON, Jan. 11, 1996, at 42.

<sup>400</sup> See Bob Holmes, *There’s an Endangered Species on My Land!*, NAT’L WILDLIFE, June 16, 1995, at 8.

<sup>401</sup> U.S. FISH AND WILDLIFE SERV., U.S. DEP’T OF INTERIOR, *PROTECTING AMERICA’S LIVING HERITAGE: A FAIR, COOPERATIVE AND SCIENTIFICALLY SOUND APPROACH TO IMPROVING THE ENDANGERED SPECIES ACT* (1995) [hereinafter *PROTECTING HERITAGE*]. See Ruhl, *Who Needs Congress?*, *supra* note 359, at 373.

<sup>402</sup> See *PROTECTING HERITAGE*, *supra* note 401, at 1.

of the ESA's section 9 "take" prohibition, including the harm rule.<sup>403</sup> The specific policy measures endorsed by the plan, which are incorporated into the *Habitat Conservation Planning Handbook (HCP Handbook)*,<sup>404</sup> include "safe harbor" agreements, candidate conservation agreements, "low impact HCPs," "4(d) rules," and "no surprises" guarantees.<sup>405</sup> Some of these measures have proven quite controversial, especially "no surprises."<sup>406</sup> Each is briefly discussed below.

### A. Safe Harbors

The idea for safe harbors originated in the Southeastern United States as a last-ditch effort to save some of the fast disappearing climax growth, long-leaf pine forest habitat of the threatened red cockaded woodpecker (RCW).<sup>407</sup> Safe harbor agreements are designed to apply in situations where habitat is currently "unoccupied," and the landowner is theoretically free to destroy it before the species arrives.<sup>408</sup> The *HCP Handbook* provides:

If a landowner voluntarily enters into an agreement to manage his or her lands in a manner that attracts endangered or threatened species or otherwise increases

<sup>403</sup> The ten points were expressed in the form of the following "principles:" increasing the quality of science; minimizing social and economic impacts; improving communications with landowners; treating landowners fairly; providing conservation incentives; making more efficient use of federal resources; preventing species from needing to be listed; recovering those species that are listed; adopting more efficient and consistent policies between FWS and NMFS; and including state, tribal and local entities in ESA policy. *See id.* at 3-4.

<sup>404</sup> *See HCP HANDBOOK, supra* note 365, at ii.

<sup>405</sup> *See generally* PROTECTING HERITAGE, *supra* note 401.

<sup>406</sup> *See, e.g.,* Kostyack, *supra* note 322.

<sup>407</sup> *See* Ted Williams, *Finding Safe Harbor*, AUDUBON, Jan.-Feb. 1996, at 26, 26-27.

<sup>408</sup> *See id.* I say "theoretically" because the issue of whether, and to what extent, habitat must be currently occupied to be protected under the Harm Rule has not yet been definitively answered by the courts. *See* *Defenders of Wildlife v. Bernal*, CV-98-120-TUC-FRZ (D. Ariz.) (on appeal to the 9th Cir.). Whether habitat is "occupied" at any given time may not be so easy to determine. Moreover, for some critically endangered species, every bit of suitable habitat, whether "occupied" or not, may be needed for breeding, feeding, and sheltering activities, if the species is to survive and recover, as recognized in the Act's definition of "critical habitat." *See* 16 U.S.C. §1532(5) ("critical habitat" includes "specific areas outside the geographical area occupied by the species at the time it is listed" if "essential to the conservation of the species.")).

their presence, the "Safe Harbor assurances" guarantee no additional regulatory requirements for those lands will be imposed on the landowners as a result of the proactive conservation measures.<sup>409</sup>

In other words, in exchange for providing *temporary* protection, the landowner is given contractual assurances that she will be able to destroy the habitat in the future notwithstanding the impact that it might have on the species at that point.<sup>410</sup> As some biologists have pointed out, this may create a problem if, for example, a species relocates its nest site into an area covered by a safe harbor agreement, due to a storm, a fire, or other "stochastic" event, only to have its new home taken away when the landowner no longer wishes to maintain it.<sup>411</sup>

There are also legal problems with safe harbor assurances that may cover large portions of a species range and last up to 100 years.<sup>412</sup> For openers, the ESA says nothing about "safe harbors," and cannot reasonably be interpreted as authorizing such agreements, notwithstanding their potential benefits.<sup>413</sup> As discussed below in the context of the even more problematic "no surprises" rule, there is no evidence that Congress intended to authorize FWS to enter into long term contracts waiving the government's regulatory authority in this fashion.<sup>414</sup>

The safe harbors approach has been roundly praised by property rights and environmental advocates alike.<sup>415</sup> When carefully drawn, such agreements can provide benefits to species that strict enforcement of the

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<sup>409</sup> HCP HANDBOOK, *supra* note 365, at 3-41.

<sup>410</sup> See *id.* Landowners are required to maintain a "baseline" condition to support any population of species that may occupy portions of their lands outside the safe harbor area. See Sheldon, *supra* note 397, at 320-21. Setting an adequate baseline, however, is difficult, and enforcing it after the passage of what may be a considerable period of time is highly problematic. See *Safe Harbor Commenters Address "Baseline," Other Issues*, ENDANGERED SPECIES & WETLANDS REPORT, Sept. 1997, at 8.

<sup>411</sup> Personal communication with Dr. Craig Pease, Vermont Law School Faculty Member (July 1998).

<sup>412</sup> See Sheldon, *supra* note 397, at 322 (The Plum Creek Timber Company HCP, covering 170,000 acres of old growth forest in the State of Washington, contains a safe harbor provision good for 50 years with the option of extending it for another 50 years).

<sup>413</sup> See 16 U.S.C. §§ 1531-1544 (1994).

<sup>414</sup> See *infra* notes 443 through 493 and accompanying text.

<sup>415</sup> See MICHAEL BEAN ET AL., RECONCILING CONFLICTS UNDER THE ESA: THE HABITAT CONSERVATION PLANNING EXPERIENCE 42 (1991); Ruhl, *Who Needs Congress?*, *supra* note 359, at 392-94.

ESA might not.<sup>416</sup> Although the ESA does not mandate such affirmative actions, it does authorize the agencies to fund them as part of recovery plans and cooperative agreements with states and landowners.<sup>417</sup> This assumes, of course that Congress actually appropriates the necessary funds—a somewhat shaky assumption, to be sure.<sup>418</sup> On the other hand, “safe harbor” agreements do not insure that habitat will be there when the species needs it. What may be a “safe harbor” for the landowner could turn out to be a “pig in a poke” from the standpoint of species recovery. Should Congress decide to codify the safe harbor policy, and thereby make it legal, it would be wise to include some safeguards such as independent scientific review of proposed agreements, opportunity for public review and comment, specific monitoring requirements, and a “safety net” provision in the event that the safe harbor becomes a death trap.

### B. *Candidate Conservation Agreements*

Candidate Conservation Agreements (CCA's), sometimes called pre-listing agreements or just voluntary conservation agreements, apply to species that are or may be eligible for listing as either threatened or endangered, but for whatever reason (e.g., listing is “warranted but precluded” by resource constraints) the responsible agency has not made a final listing decision.<sup>419</sup> As already mentioned, one advantage of a CCA is that it may result in conservation measures being taken much earlier than would otherwise occur under the painstakingly slow processes of the ESA, and before a species declines to the point where recovery is more difficult, if not impossible.<sup>420</sup> The downside is that they can become an excuse not to list a species that should be, thereby denying it the full protection that the law requires.<sup>421</sup>

Prior to its post-1994 election epiphany, FWS recognized this shortcoming and took the position that CCA's could not be used “in lieu

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<sup>416</sup> This is especially true in situations where active management is required to actually create or restore habitat, for example, the removal of an exotic species, or controlled burns to create “early successional” habitat.

<sup>417</sup> See 16 U.S.C. § 1535(d)(D) (authorizing funding to states based on “the potential for restoring endangered species and threatened species within a state”).

<sup>418</sup> See 16 U.S.C. § 1535(d).

<sup>419</sup> See generally 16 U.S.C. § 1533(b)(3). See also Houck, *supra* note 234, at 285-91.

<sup>420</sup> See *supra* notes 360 to 364 and accompanying text.

<sup>421</sup> See *Oregon Natural Resources Council v. Daley*, 6 F. Supp.2d 1139 (D. Or. 1998).

of listing.”<sup>422</sup> In its November 1994 draft guidance, however, FWS did an about-face, and declared that eliminating the need for listing is one of the principal purposes of a CCA.<sup>423</sup> In its 1997 restatement of the draft CCA policy, FWS went even further, declaring that “the ultimate goal of Candidate Conservation Agreements is to . . . nullify the need to list [species] as endangered or threatened.”<sup>424</sup> FWS took this step in the face of a string of court cases holding that pre-listing agreements were unlawful.<sup>425</sup> Indeed, FWS Director Jamie Clark said she was “undeterred” by the adverse court rulings.<sup>426</sup>

One of the reasons that FWS has lost so many of these cases is that the agreements that have been challenged lack substance—to put it as charitably as possible—a fact noted by more than one federal judge.<sup>427</sup> In fact, many of these agreements contain more wishful thinking than concrete solutions to the causes of species endangerment. In the recent case striking down the agreement between NMFS and the States of Oregon and California involving the coho salmon, for example, Judge Stewart noted “[t]he wait-and-see stance of the NMFS has no support in the ESA. Instead of placing the risk on the future and voluntary conservation measures proposed by the [Oregon Coastal Salmon Restoration Initiation Plan], the NMFS placed the risk squarely on the species.”<sup>428</sup>

No doubt FWS and NMFS have good intentions in seeking these voluntary agreements. Alas, the road to the courthouse is paved with such intentions. The agencies would be better off sticking to the clear language

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<sup>422</sup> See Memorandum From FWS Associate Director to Regional Directors Regarding Conservation Agreements (May 20, 1985), cited in Ruhl, *Who Needs Congress?*, *supra* note 359, at 385 n.70.

<sup>423</sup> See U.S. FISH AND WILDLIFE SERVICE, ENDANGERED SPECIES PROGRAM: CANDIDATE SPECIES GUIDANCE (Draft 1994).

<sup>424</sup> See Safe Harbor Agreements and Candidate Conservation Agreements, 62 Fed. Reg. 32,189 (1997) (to be codified at 50 C.F.R. pt. 13 and 17).

<sup>425</sup> See *supra* note 364 and accompanying text.

<sup>426</sup> See *Clark Says FWS Stands Behind Conservation Agreement Program*, ENDANGERED SPECIES & WETLANDS REP., Apr. 1997, at 16.

<sup>427</sup> See, e.g., *Save Our Springs Legal Defense Fund v. Babbitt*, Civ. No. 96-168-CA (W.D. Tex., Mar. 25, 1997) (finding that FWS’s decision to approve a CCA was arbitrary, and observing: “[T]he effect of the measures that are articulated in the Conservation Agreement on the species is speculative. There are no assurances that the measures will be carried out, when they will be carried out, nor whether they will be effective in eliminating the threats to the species.”) *Id.* at 9.

<sup>428</sup> *Oregon Natural Resources Council v. Daley*, 6 F. Supp.2d 1139, 1151 (D. Or. 1998).



of the statute and listing species when the "best scientific information" shows that they should be listed. The voluntary agreements can then be used as the basis for what should be a prompt and effective recovery plan.

### C. *Section 4(d) Rules*

Section 4(d) of the ESA authorizes the Secretary to issue "such regulations as he deems necessary and advisable to provide for the conservation" of threatened species.<sup>429</sup> The provision does not apply to endangered species.<sup>430</sup> For threatened species the provision gives the Secretary more flexibility to try alternative regulatory approaches to recovery, including the authorization of activities that might otherwise constitute a prohibited "take" under section 9.<sup>431</sup> This authority has been used to adopt innovative programs such as the Natural Community Conservation Plan (NCCP) developed by the State of California to deal with the California gnatcatcher in Southern California.<sup>432</sup>

Though 4(d) rules can be a useful tool, they are limited in application by the fact that threatened species constitute only one-fifth of all listed species.<sup>433</sup> However, the designation of a species as threatened rather than endangered can be manipulated to suit political purposes. There is no bright biological line between threatened and endangered; rather the status of a species rests on a continuum between a viable population and extinction.<sup>434</sup> The listing classification often comes down to a judgment call on the part of FWS or NMFS—the kind of "expert determination" requiring judicial deference under the arbitrary and capricious standard of the Administrative Procedure Act.<sup>435</sup>

### D. *Small Landowner-Low Impact Activities*

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<sup>429</sup> 16 U.S.C. § 1533(d) (1994).

<sup>430</sup> *See id.*

<sup>431</sup> *See id.*

<sup>432</sup> *See supra* note 366 and accompanying text.

<sup>433</sup> *See Box Score, supra* note 333.

<sup>434</sup> *See* Pease & Lande, *supra* note 207 (advocating the use of a population viability analysis, taking into account population size, environmental risks, and the genetic composition of the population, to determine whether a species is threatened or endangered). *See also* 16 U.S.C. § 1532 (defining endangered and threatened species).

<sup>435</sup> *See* 5 U.S.C. § 706(2)(A) (1994); *Citizens to Preserve Overton Park v. Volpe*, 401 U.S. 402 (1971).

On July 20, 1995, FWS proposed a rule to implement the small landowner-low impact exemption previously announced in its ten point plan.<sup>436</sup> Like 4(d) rules, this exemption applies only to threatened species.<sup>437</sup> The principle effect of the proposed rule is to create a categorical incidental take permit for covered activities, thereby insulating "small landowners" from liability for harm to species which is presumed to "individually or cumulatively have little or no lasting effect on the likelihood of the survival and recovery of the threatened species" affected.<sup>438</sup> Examples given in the proposed rule include routine residential yard maintenance and small construction projects.<sup>439</sup> The rule uses a five acre rule of thumb for determining whether an activity qualifies as having a "negligible impact."<sup>440</sup> If that was all there was to it, the rule might not cause much of a stir. But the rule also grants FWS blanket authority to designate an unspecified class of "activities" as having negligible impact.<sup>441</sup> Rather large objects can find their way through that kind of loophole.<sup>442</sup>

#### E. *No Surprises*

By far the most controversial of the Clinton Administration's ESA reforms is the "no surprises" policy, first announced on August 11, 1994, and now codified as a regulation.<sup>443</sup> The preamble to the final rule states its purpose very forthrightly:

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<sup>436</sup> See Proposed Rule Exempting Certain Small Landowners and Low-Impact Activities from Endangered Species Act Requirements for Threatened Species, 60 Fed. Reg. 37,419 (1995) (to be codified at 50 C.F.R. pt. 17).

<sup>437</sup> See *id.*

<sup>438</sup> *Id.*

<sup>439</sup> See *id.* at 37,421.

<sup>440</sup> See *id.* at 37,421-423.

<sup>441</sup> See *id.* at 37,421.

<sup>442</sup> Small losses of habitat have a way of adding up to big losses over time, as the experience under the Corps of Engineers Nationwide Permit Program under section 404 of the Clean Water Act unfortunately makes clear. See Clean Water Act, 33 U.S.C. § 1344 (1994). Many hundreds of thousands of wetlands were lost during the 18 years that Nationwide Permit 26, which categorically authorized activities affecting less than ten acres of wetlands, was on the books. The Corps recently published a rule scrapping Nationwide Permit 26. See 63 Fed. Reg. 36,040 (1998).

<sup>443</sup> See 63 Fed. Reg. 8859 (1998) (to be codified at 50 C.F.R. pt. 17 and 50 C.F.R. pt. 222).

The No Surprises Policy announced in 1994 provides regulatory assurances to the holder of a Habitat Conservation Plan (HCP) incidental take permit issued under section 10(a) of the ESA that no additional land use restrictions or financial compensation will be required of the permit holder with respect to species covered by the permit, even if unforeseen circumstances arise after the permit is issued indicating that additional mitigation is needed for a given species covered by a permit.<sup>444</sup>

Or, as Secretary Babbitt put it, “[a] deal is a deal.”<sup>445</sup>

And what a deal. Landowners are lining up to get in on this deal. Since the policy went into effect some 225 HCPs have been approved, and another 200 or so are in the pipeline.<sup>446</sup> This compares to a total of fourteen HCPs approved between 1982 and 1992.<sup>447</sup> No question developers see the policy as a good deal, but what about the species?

Though it is too soon for any definitive answers, preliminary reviews of these “user friendly” HCPs raise a number of red flags. Most troubling is the lack of scientific integrity underlying many of the plans. In the first large-scale study of HCPs, sponsored by the National Science Foundation and the American Institute for Biological Sciences, scientists found that many plans “do not estimate the specific number of plants and animals that may be harmed or destroyed.”<sup>448</sup> The scientists also concluded that “only a small fraction” of existing plans have “clear monitoring programs” adequate for measuring success.<sup>449</sup> Some plans actually prescribed mitigation measures that would do more harm than good for the species.<sup>450</sup> The study concludes that the responsible agencies

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<sup>444</sup> *Id.* at 8859.

<sup>445</sup> U.S. Department of Interior, Office of the Secretary, News Release, *Administration's New Assurance Policy Tells Landowners: No Surprises in Endangered Species Planning*, Mar. 11, 1994, available in 1994 WL 440313.

<sup>446</sup> See Kostyack, *supra* note 205, at 22.

<sup>447</sup> See FRAYED SAFETY NETS, *supra* note 369, at vi.

<sup>448</sup> Deborah Schoch, *New Approach to Protecting Fragile Habitats Criticized*, L.A. TIMES, July 20, 1998, at A16. The study, chaired by Professor Peter Kareiva of the University of Washington, looked at 208 HCPs, and examined 44 in depth. Professor Kareiva commented, “[t]here are a huge number of HCPs that probably should not have been written.” See Carol Kacsukyoon, *Many Habitat Conservation Plans Found to Lack Key Data*, N.Y. TIMES, Dec. 23, 1997, at F3.

<sup>449</sup> See Schoch, *supra* note 448, at A16.

<sup>450</sup> See *id.* at A3 (stating, “[b]ut the draft study . . . indicates that some plans lacked

should develop "basic scientific standards" before approving more HCPs.<sup>451</sup> In other words, the Services could use a refresher course in Biology 101.

Conservation organizations, while generally supportive of the concept of expanding the use of HCPs in appropriate situations, have also been strongly critical of the plans that the no surprises policy is producing. For example, Defenders of Wildlife (DOW) conducted a study of twenty-four plans, mostly HCPs, selected on the basis of geographic and taxonomic diversity.<sup>452</sup> In a report released this year, DOW concluded that "the conservation gains have been disappointing" and that "some plans actually have diminished species chances for recovery."<sup>453</sup> In particular, DOW faulted the HCP program for failing to set measurable, recovery-based biological goals, provide for meaningful public participation in the conservation planning process, require adequate monitoring, insure adequate funding, and provide for independent scientific review of individual HCPs.<sup>454</sup> Thus, it appears that the no surprises rule is operating on "bad science."<sup>455</sup>

It is also based on bad law, for the following reasons. First, the rule is based on a distorted, post-hoc reading of the 1982 amendments to the ESA that created the incidental take permit (ITP) and HCP provisions.<sup>456</sup> Specifically, FWS and NMFS now take the position (in contrast to their administrative practice over the preceding fourteen years) that HCPs need not improve, and may even decrease, a species chances for

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scientific input and raises warning flags about whether some species . . . are receiving the protection government regulators envisioned . . .").

<sup>451</sup> See *id.* Scientists from all quarters have been weighing in against the no surprises approach. In a 1996 letter to Congress, a group of 167 scientists stated that the policy "does not reflect ecological reality and rejects the best scientific knowledge and judgment of our time." See Kostyack, *supra* note 205, at 22. In a subsequent statement, known as the "Stanford Letter," nine distinguished conservation biologists, led by Dr. Dennis Murphy of Stanford University, noted that HCPs were being developed "without scientific guidance" and "have the potential to become habitat giveaways that contribute to, rather than alleviate, threats to listed species and their habitats." *Id.*

<sup>452</sup> See FRAYED SAFETY NETS, *supra* note 369, at xi.

<sup>453</sup> See *id.* at vii.

<sup>454</sup> See *id.* at 80-82.

<sup>455</sup> ESA critics who often complain about "bad science" in the listing process have yet to be heard from on the lack of scientific integrity in the HCP program. See MANN & PLUMMER, *supra* note 91, at 204-08.

<sup>456</sup> See Endangered Species Act Amendments of 1982 § 10, Pub. L. No. 97-304, 96 Stat. 1422-24 (codified as amended at 16 U.S.C. § 1539(a) (1994)).

recovery so long as it does not jeopardize its survival.<sup>457</sup> Thus, as was the case with the section 7 jeopardy standard discussed above, the agencies have once again made bare survival the operative standard for approval of HCPs and the issuance of ITPs. However, section 10 plainly states that the Secretary cannot issue an ITP unless he finds that the HCP "will not appreciably diminish the likelihood of the survival *and recovery* of the species in the wild."<sup>458</sup> Notwithstanding this dual standard, NMFS and FWS stubbornly insist on pursuing this policy of brinksmanship, accommodating further erosion of the habitat base while trying to avoid pushing species over the edge.<sup>459</sup>

Normally, an agency would be entitled to deference in interpreting ambiguous statutory language, but here the statute is not the least bit ambiguous.<sup>460</sup> Indeed, Congress has "spoken directly to the issue at hand, and its intent must be given effect."<sup>461</sup> Congress ordered the Services not

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<sup>457</sup> In the preamble to the proposed rule, the agencies stated:

Congress included in the ESA Amendments of 1982 provisions under section 10(a) to allow the Services to issue permits authorizing the incidental take of listed species in the course of otherwise lawful activities, provided that those activities were conducted according to an approved conservation plan (habitat conservation plan or HCP) and the issuance of the HCP permit would not jeopardize the continued existence of the species.

63 Fed. Reg. 8859 (1998). "While it may be appropriate to consider an 'enhancement factor' for an HCP, it is not a mandatory section 10(a)(2)(B) issuance criterion for all species." 63 Fed. Reg. at 8861. As examples of when it would be "appropriate" to consider recovery needs the agencies cited the case of a "severely depleted species." *See id.* However, the agencies point to nothing in the legislative history of the 1982 amendments indicating that Congress meant to distinguish between species that are "severely depleted" and those that are just plain depleted. *See id.*

<sup>458</sup> 16 U.S.C. § 1539(a)(2)(B)(iv) (emphasis added).

<sup>459</sup> For example, in response to several commentators who pointed out that the rule could reduce the recovery as well as the survival of covered species, the agencies merely reiterated that they would insure "that the permitted activities avoid jeopardy to the continued existence of the affected species." 63 Fed. Reg. at 8859, 8863 (1998).

<sup>460</sup> *See, e.g., Chevron v. Natural Resources Defense Council*, 467 U.S. 837, 844 (1984) (stating "[w]e have long recognized that considerable weight should be accorded to an executive department's construction of a statutory scheme it is entitled to administer.").

<sup>461</sup> *Id.* at 842. The legislative history is consistent with the "plain meaning" of the statute. Congress characterized the enhancement of species survival and recovery as a "basic element" of HCPs, and directed the Secretary to "consider the extent to which the conservation plan is likely to enhance the habitat of the listed species or increase the long term survivability of the species or its ecosystem." H.R. CONF REP. NO. 97-835, at 31 (1982).

to grant permits that would appreciably reduce the likelihood of recovery; yet that is exactly what the Services are doing under no surprises. Moreover, even if there was room for interpretation, the Services' current reading does not meet the traditional tests for deference.<sup>462</sup> Far from being a "contemporaneous and consistent" interpretation, it suddenly appears over a decade after passage of the 1982 ESA amendments, and represents a radical departure from administrative policy and practice during the intervening years. Indeed, the whole point of no surprises and the other "points of light" is to "reform" the ESA by effecting major change in the way the Services implement the law.<sup>463</sup> While agencies are certainly entitled to change their view of what is in the public interest, they must provide a "reasoned analysis" before reversing course, especially where the inspiration for the policy shift seems politically motivated.<sup>464</sup> Finally, the current interpretation flies in the face of the fundamental purpose of the statute, which is to conserve species and the ecosystems upon which they depend.<sup>465</sup> The no surprises rule explicitly elevates landowners interests, valid as they may be, over the ESA's paramount goal of species recovery.<sup>466</sup>

Today's HCPs are a far cry from what Congress envisioned in 1982. The model that Congress used to fashion the 1982 amendments was

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<sup>462</sup> See, e.g., *American Paper Inst. v. American Elec. Power Serv. Corp.*, 461 U.S. 402 (1983):

To uphold [the agency interpretation] we need not find that [its] construction is the only reasonable one, or even that it is the result we would have reached had the question arisen in the first instance in judicial proceedings . . . we need only conclude that it is a reasonable interpretation of the relevant provisions.

*Id.* at 422-23 (quoting *Unemployment Compensation Comm'n v. Aragon*, 329 U.S. 143, 153 (1946)).

<sup>463</sup> See *Habitat Conservation Plan Assurances ("No Surprises") Rule*, 63 Fed. Reg. 8859, pmb1.

<sup>464</sup> See *Motor Vehicles Mfrs. Ass'n. v. State Farm Mutual Auto. Co.*, 463 U.S. 29, 56 (1983).

<sup>465</sup> See 16 U.S.C. § 1531(b) (1994).

<sup>466</sup> As the Services stated in the rule's preamble: "A driving concern during the development of the policy was the absence of adequate incentives for non-Federal landowners to factor endangered species conservation into their day to day management activities." 63 Fed. Reg. 8860. This statement seems to ignore the fact that the ESA itself requires landowners to factor endangered species conservation into their day-to-day operations. What the Services are really saying is that they do not have the stomach for enforcing such requirements. "Incentives," in other words, is a euphemism for "deregulation."

a voluntary conservation agreement involving two listed species of butterflies on San Bruno Mountains north of San Francisco.<sup>467</sup> Under the San Bruno plan, some ninety percent of the butterflies known habitat was set aside in perpetuity as a reserve, setting a very high standard for future plans.<sup>468</sup> The plan also provided for annual monitoring, required affirmative "enhancement" measures to remove invasive species, authorized third-party (i.e. citizen) enforcement, and explicitly provided for revocation in the event that the monitoring indicated that the biological goals were not being met.<sup>469</sup> Given this as the model, it is hard to imagine that the ninety-seventh Congress intended to authorize the Services to approve plans that are so diametrically opposite.

Second, the no surprises rule violates the Services' affirmative conservation duties under section 7(a)(1).<sup>470</sup> As discussed above, section 7(a)(1) imposes especially strict conservation obligations on the Services in light of their critical responsibilities under the Act.<sup>471</sup> When several commenters pointed out this obligation, the Services replied "[t]he Services encourage all applicants to maximize benefits to species covered by their HCPs because of the Services' responsibilities under 7(a)(1)."<sup>472</sup> Either the Services missed the point, or they equate "encourage others" with "shall utilize their authorities to further the purposes of the statute." A reviewing court is not likely to be quite so cavalier.

Third, the very premise of no surprises, that the Services have the power to contract away the federal government's regulatory authority over vast segments of the landscape in permits lasting up to 100 years, is fatally flawed.<sup>473</sup> The U.S. Supreme Court has never sanctioned this type of waiver of regulatory (as opposed to budgetary) sovereignty, and it has struck down contracts purporting to do so in every case it has considered.<sup>474</sup> To date, these cases have involved state contracts, but their

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<sup>467</sup> See Robert D. Thornton, *Searching For Consensus And Predictability: Habitat Conservation Planning Under The Endangered Species Act of 1973*, 21 ENVTL. L. 605, 626 (1991).

<sup>468</sup> See Kostyack, *supra* note 205, at 21.

<sup>469</sup> See FRAYED SAFETY NETS, *supra* note 369, at 30, 35.

<sup>470</sup> See 16 U.S.C. § 1536(a)(1) (1994).

<sup>471</sup> See *supra* note 275 and accompanying text.

<sup>472</sup> Habitat Conservation Plan Assurances ("No Surprises") Rule, 63 Fed. Reg. 8859, 8862 (1998).

<sup>473</sup> Over five million acres are covered by the HCPs that have been approved or are in the pipeline. The Plum Creek HCP has an initial permit for 50 years with a 50 year extension option. See Sheldon, *supra* note 397, at 322.

<sup>474</sup> See Donald C. Baur & Karen L. Donovan, *The No Surprises Policy: Contracts 101*

logic applies with equal, perhaps even greater, force to the federal government.<sup>475</sup>

The device by which the Services purport to waive this regulatory power is the “unforeseen circumstances” provision that is to be included in each HCP.<sup>476</sup> As the rule’s preamble explains:

In negotiating unforeseen circumstances, the Services will not require without the consent of the permittee, the commitment of additional land, water or financial compensation or additional restrictions on the use of land, water, including quantity and timing of delivery, or other natural resources beyond the level otherwise agreed upon for the species covered by the conservation plan.<sup>477</sup>

Species “covered by the conservation plan” may include both listed and unlisted species provided the unlisted are “treated as if they were listed.”<sup>478</sup> In the event an “unforeseen circumstance” arises, and the permittee declines to undertake additional mitigation measures requiring the kinds of commitments described, the burden shifts to the Services to undertake them, if they can.<sup>479</sup> To the extent that this entails, for example, the expenditure of money, which it almost certainly would, the Services must seek appropriations from Congress, perhaps far removed in time and circumstance from the present.<sup>480</sup> In response to concerns raised about the

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*Meets the Endangered Species Act*, 27 ENVTL. L. 767 (1997); Amy C. Derry, *No Surprises After Winstar: Contractual Certainty and Habitat Conservation Planning Under the Endangered Species Act*, 17 VA. ENVTL. L.J. 357 (1998); Eric Fisher, *Habitat Conservation Planning Under the Endangered Species Act: No Surprises & the Quest for Certainty*, 67 U. COLO. L. REV. 371, 391-97 (1996); David B. Toscano, *Forbearance Agreements: Invalid Contracts for the Surrender of Sovereignty*, 92 COLUM. L. REV. 426, 447-57 (1992).

<sup>475</sup> See Toscano, *supra* note 474, at 457.

<sup>476</sup> The rule defines “unforeseen circumstances” to mean

changes in circumstances affecting a species or geographic area covered by a conservation plan that could not reasonably have been anticipated by plan developers and the Service at the time of the conservation plan’s negotiation and development, and that result in a substantial and adverse change in the status of the covered species.

63 Fed. Reg. at 8870 (to be codified at 50 C.F.R. pt. 17.3).

<sup>477</sup> *Id.* at 8868.

<sup>478</sup> See *id.*

<sup>479</sup> See *id.*

<sup>480</sup> See *id.* at 8864.



uncertainty of this prospective Congressional rescue of failed HCPs, the Services offer this bit of consolation: "The Services believe the No Surprises rule places the preponderance of the responsibility for protection beyond the terms of a specific HCP upon the Services. The only impediments to the Services' assumption of this additional responsibility will arise from limits on authority or funding to provide the additional protection."<sup>481</sup> In reality, of course, any risk associated with unforeseen circumstances falls on the species, not on the Services. If an HCP fails and there is no money appropriated to deal with it, the species will suffer, not the bureaucrats who negotiated the deal, or those who come after.

The Services' response to this argument will no doubt be that they are merely exercising their enforcement discretion. There are several problems with this response. First, a guarantee that there will be no further enforcement for 100 years, no matter what happens to the species, or how unfounded the assumptions underlying the HCP prove to be, seems to go well beyond the bounds of any reasonable exercise of discretion.

Second, it would be disingenuous for the Services to argue that the rule is not intended to constrain the regulatory authority of future Administrations. The stated purpose of the rule is to "provide certainty to landowners regarding their legal obligations."<sup>482</sup> In fact, the Services' originally proposed to include a legally binding permit-shield provision, but deleted it from the final rule because the Services felt it was not needed to provide the kind of legal certainty landowners were seeking.<sup>483</sup> Thus the rule goes far beyond a simple exercise of prosecutorial discretion. It seeks to exempt permit holders, which presumably includes successive owners, from any regulatory control beyond that agreed to in the HCP, for the life of the permit, which may be upwards of fifty years, regardless of what happens to the species covered by the plan.<sup>484</sup>

Moreover, assuming for the moment these contractual assurances are valid, they would clearly constrain what a future Administration or Congress can do with respect to regulating activity within areas covered

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<sup>481</sup> *Id.* at 8862.

<sup>482</sup> *Id.* at 8864.

<sup>483</sup> Although the Services have decided not to include a legally binding permit-shield provision in the final rule, they nonetheless strongly support a policy that permittees should feel free of potential prosecution if they are acting under the authorizations their permit and are complying with the terms and conditions of the permit.

*Id.* at 8865.

<sup>484</sup> *See id.*

by the permit. Landowners would have recourse for breach of contract in the Federal Claims Court, an increasingly friendly forum for property rights.<sup>485</sup> The U.S. Supreme Court's recent decision in the *Winstar* case lends considerable weight to such claims.<sup>486</sup>

Alternatively, and more likely, the contracts may ultimately be deemed invalid because the Services lacked the authority to enter into them in the first place. It is a basic principle of constitutional and administrative law that agencies cannot contract away the government's regulatory authority in the absence of an explicit and unmistakable statutory authorization to do so.<sup>487</sup> The unmistakability doctrine is based on the longstanding principle that contracts limiting the government's future exercise of regulatory authority are strongly disfavored and will be recognized only when there is no doubt that is what Congress intended.<sup>488</sup>

The Services cannot point to any explicit language in the ESA that would authorize an "unmistakable" grant of authority allowing them to waive the federal government's regulatory authority, and their attempt to glean it from a few snippets of legislative history is akin to making sunshine from cucumbers.<sup>489</sup> Certainly Congress understood in 1982 that both species and landowners needed long term assurances that HCPs would work, and it specifically directed the Services to take account of unforeseen circumstances in the HCP planning process.<sup>490</sup> However, Congress did not specify any particular mechanism to deal with such uncertainty, wisely leaving that determination to the facts and

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<sup>485</sup> See generally Douglas T. Kendall & Charles P. Lord, *The Takings Project: A Critical Analysis and Assessment of the Progress So Far*, 25 B.C. ENVTL. AFF. L. REV. 509, 536 (referring to the appointment of Loren Smith as Chief Judge of the Court of Federal Claims).

<sup>486</sup> See *United States v. Winstar*, 518 U.S. 839 (1996). In a plurality decision, the Court held that when Congress subsequently changes the relevant law on which contracts with private parties are based, thereby barring the government from honoring its prior agreement with members of a regulated industry, the government is liable for damages to the regulated industry for breach of contract. If Congress cannot retroactively change the terms of government contracts, administrative agencies certainly cannot. See *id.*

<sup>487</sup> See *id.* at 2457-58.

<sup>488</sup> See, e.g., *Bowen v. Public Agencies Opposed to Social Security Entrapment*, 477 U.S. 41 (1986).

<sup>489</sup> In the preamble to the rule, the Services cite a single, ambiguous passage from the Conference Committee Report as the source of their authority: "Congress indicated that it was acting to . . . address the concerns . . ." 63 Fed. Reg. at 8859.

<sup>490</sup> See H. R. Conf. Rep. No. 97-835, at 30-31 (1982).

circumstances of particular cases.<sup>491</sup> There is not the slightest indication that Congress contemplated giving the Services the power to basically exempt nonfederal landowners from the ESA in exchange for a one-time promise of mitigation designed to, at best, avoid jeopardizing the survival of the covered species, but stopping well short of any kind of permanent solution to the underlying problem that lead to the endangerment.<sup>492</sup> Indeed, as discussed, the San Bruno model that Congress was working from, took exactly the opposite approach: it provided a high degree of confidence in species *recovery* (i.e. setting aside ninety percent of the species habitat) while reserving the option of re-opening the agreement to consider corrective actions in the event of "unforeseen circumstances."<sup>493</sup>

In the end, the no surprises rule fails to deliver on its promise of certainty. The Services cannot give what they do not have, and they do not have the authority to guarantee that owners of land containing endangered species habitat will not be called upon at some point in the future to undertake mitigation measures that were not specified in an HCP, especially one based on bad data and false assumptions.

## VII. LEGISLATIVE REFORMS

It has been nearly a decade since the ESA was reauthorized. It has survived on a series of continuing resolutions, saddled from time to time by riders imposing moratoria on listings and other actions.<sup>494</sup> With the issues badly polarized and partisan politics at play, neither the opponents nor the proponents have been able to muster a majority of votes to move a reauthorization bill in either the House or the Senate.<sup>495</sup>

For a while in early 1998, it looked like the impasse might be broken by a bipartisan bill crafted by Senators John Chafee (R. R.I.), a long-time ESA supporter, Dirk Kempthorne (R. Idaho), the conservative Chair of the Endangered Species Subcommittee of the Senate Environment Committee, Max Baucus (D. Mont.), and Harry Reid (D.

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<sup>491</sup> *See id.*

<sup>492</sup> *See id.*

<sup>493</sup> *See supra* note 320 and accompanying text.

<sup>494</sup> *See* transcript of debate in 142 CONG. REC. S1838-1851 (daily ed. Mar. 12, 1996) (statements of Senators Reid, Baucus, Hutchison, Chafee, Exon, Kempthorne, Lieberman). The discussion continues in 143 CONG. REC. S1907-1911 (daily ed. Mar. 13, 1996) (statements of Senators Reid, Chafee, Hutchison, Faircloth, and Gramm).

<sup>495</sup> *See* 142 CONG. REC. S1841 (statement of Sen. Hutchison).

Nev.).<sup>496</sup> The so-called Kempthorne Bill was introduced September 17, 1997, quickly garnered the support of Secretary Babbitt and the Clinton Administration, sailed through Committee in October, and seemed headed for certain passage as soon as the Senate leadership was ready to bring it to the floor for a vote.<sup>497</sup> Without the Administration's support, and with little support in Congress, the environmental community was not able to mount an effective campaign to derail the bill.<sup>498</sup> The development community, while seeking additional amendments on the Senate floor, was content to let the Senate pass a bill, knowing the real fight would be in the House, where they had stronger support.<sup>499</sup>

But then a funny thing happened, as they always do in Congress. Just as Senate Majority Leader Trent Lott (R. Miss.) was getting set to bring the bill to the floor, Senator Pete Domenici (R. N.M.) threw a monkey wrench into things by engineering passage of an amendment to an appropriations bill earmarking the proceeds from the sale of public lands in the West as the source of funding for several key provisions of the Kempthorne Bill.<sup>500</sup> Privatizing public lands has long been a goal of Senator Domenici (whose home state of New Mexico is over fifty percent federally owned) and tying it to funding for endangered species must have seemed like a clever move. However, it generated so much controversy that Senator Lott decided not to proceed with the Kempthorne Bill.<sup>501</sup> It now appears, as of this writing, that the Kempthorne Bill is dead for this session of Congress, and with the new faces in in the current Congress, it is impossible to predict what will happen next. Nevertheless, it is a fair assumption that the Kempthorne Bill, or something very much like it, will be revived in the next session of Congress. Therefore it is useful to describe briefly its major provisions.

The stated goals of *The Endangered Species Recovery Act of 1997* (the official title of the Kempthorne Bill) are: "first, to maintain and improve conservation of endangered and threatened species; second, to improve and expedite recovery of those species; and third, to reduce the

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<sup>496</sup> SENATE COMM. ON ENV'T AND PUB. WORKS, ENDANGERED SPECIES RECOVERY ACT OF 1997, S. REP. NO. 105-128 (1997) [hereinafter S. REP. NO. 128].

<sup>497</sup> See Kacsukyoon, *supra* note 483.

<sup>498</sup> See *id.*

<sup>499</sup> See *id.*

<sup>500</sup> See, e.g., Rocky Barker, *Species Bill May Still Have a Chance, Kempthorne Hopes to Get Some Reforms*, IDAHO STATESMAN, July 11, 1998, at A1.

<sup>501</sup> See *id.*

regulatory burden on, and uncertainty for, property owners.”<sup>502</sup> The bill contains numerous provisions intended to accelerate recovery planning and implementation.<sup>503</sup> However, the bill also imposes a host of new procedural steps in the recovery planning process, which will require a doubling of the Services’ annual budgets.<sup>504</sup> There is considerable skepticism, both within and outside Congress, that the necessary funds will be forthcoming from the appropriations committees, which have a much different make-up, and a different set of priorities, than the authorizing committees.<sup>505</sup> If the staffing and funding do not materialize, then the recovery process could actually grind to a halt.<sup>506</sup>

The Kempthorne Bill relies heavily on voluntary measures to actually achieve recovery.<sup>507</sup> These measures, in turn, rely on a package of economic incentives, for example, tax credits, that are contained in a companion bill.<sup>508</sup> This bill provides no permanent source of funding for these measures.<sup>509</sup> Thus, as with the agency budgets, the success of this voluntary approach hinges on the vagaries of the annual appropriations process. If past is prologue, the funding will not be generous.

The most controversial aspect of the Kempthorne Bill is that it would codify the Clinton Administration’s reforms, particularly the no surprises, safe harbors, small landowners, and candidate conservation agreement policies.<sup>510</sup> Inclusion of these policies seems to be a tacit acknowledgment their status under the current law is, at best, unclear. The Kempthorne Bill does not deal with the more volatile subjects of compensation for property owners and non-interference with state-

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<sup>502</sup> S. REP. NO. 128, *supra* note 496, at 1-2.

<sup>503</sup> *See id.* at 16-24.

<sup>504</sup> *See id.* at 39. New procedures include multiple species conservation plans, low effect activities permits, no surprises, candidate conservative agreements, safe harbor agreements, habitat reserve agreements, and scientific permits. *See id.* at 31-37.

<sup>505</sup> *See* Testimony of Jamie Rappaport Clark, Director, Fish and Wildlife Serv., Dept. of the Interior, Before the House, Comm. on Resources, on Implementation and Enforcement of the Endangered Species Act, Mar. 5, 1998, *available in* 1998 WL 8992880.

<sup>506</sup> *See Additional Views of Senators Lieberman, Moynihan, Graham, Lautenberg, and Boxer*, in S. REP. NO. 128, *supra* note 496, at 56-60.

<sup>507</sup> *See id.* at 28-29.

<sup>508</sup> *See* 143 Cong. Rec. S9423-9424 (daily ed. Sept. 16, 1997) (statement of Sen. Kempthorne). The companion bill, S.1181, is printed in 143 Cong. Rec. S9424-9426 (daily ed. Sept. 16, 1997) (statement of Sen. Kempthorne).

<sup>509</sup> *See id.*

<sup>510</sup> *See* S. REP. NO. 128, *supra* note 496, at 33-35.

allocated water rights which have been “hot button” issues in the House.<sup>511</sup>

The House side counterpoint to the Kempthorne Bill is the Miller Bill, introduced by Representative George Miller (D. Ca.) on July 31, 1997.<sup>512</sup> Titled *Endangered Species Recovery Act of 1997*, the Miller Bill makes recovery a substantive requirement of the law.<sup>513</sup> As Congressman Miller stated upon introducing the bill, “[t]he single most important change this bill would make to existing law is to insure that all our actions under the ESA—Federal actions or the actions of private landowners—do not undermine the recovery of a species.”<sup>514</sup>

The Miller Bill contains a number of economic incentives for landowners, requires performance bonds for HCPs, establishes a Habitat Conservation Trust Fund, limits the duration of incidental take permits, provides for a “low-impact” HCP exception, and imposes new obligations on federal agencies to implement conservation measures established in recovery plans.<sup>515</sup> In short, the Miller Bill is a conservationist’s delight, but it is unlikely to get out of the House Resources Committee as long as Representative Young is the Chair.<sup>516</sup>

## VIII. REAL REFORM

The test of any reform is whether it fixes the problem. As this article has hopefully demonstrated, the problem of species endangerment and biodiversity loss is huge and getting “huger.” There is no secret to the major cause of this problem: habitat loss. Unless the rate of habitat loss is halted, and reversed through a concerted restoration effort, there is little hope that listed species will recover or that additional listings can be prevented.<sup>517</sup> For some species, even more heroic efforts, such as captive breeding and reintroduction, will be required.<sup>518</sup> Others may never fully

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<sup>511</sup> See *id.* at 41.

<sup>512</sup> See 143 CONG. REC. E1595-1596 (daily ed. Aug. 1, 1997) (statement of Rep. Miller).

<sup>513</sup> The Bill would accomplish this by the deceptively simple device of redefining the “jeopardy” standard to mean any action that “reasonably would be expected, directly, indirectly or cumulatively to reduce appreciably the likelihood for recovery in the wild.” See *id.* at § 101(24).

<sup>514</sup> See 143 CONG. REC. E1596.

<sup>515</sup> See *id.*

<sup>516</sup> It is this author’s opinion that Representative Young has no interest in moving this bill.

<sup>517</sup> See *supra* notes 365 to 370 and accompanying text.

<sup>518</sup> See, e.g., Ken Alvarez, *The Florida Panther Recovery Program: An Organizational Failure of the Endangered Species Act*, in FINDING THE LESSONS, IMPROVING THE

recover and will require "perpetual care."

The administrative and legislative reforms discussed above are primarily aimed at providing regulatory relief to property owners, not at attacking the root causes of habitat loss. The premise of these reforms is that the ESA itself is the problem because it makes people destroy habitat rather than change the way they use the land.<sup>519</sup> One would hope that this is an overly pessimistic assessment of American values and stewardship ethics at this stage in our cultural development. But even if it is accurate, how is it going to help the situation to sanction habitat destruction by issuing permits? In place of the "perverse incentives" that the ESA is said to create, reforms such as "safe harbors" and "no surprises" simply create "legal incentives" to destroy habitat, subject, of course, to agreed upon mitigation measures contained in HCPs. Yet by definition these measures are not designed to provide "net benefits" to the "covered species," or even to contribute to recovery.<sup>520</sup> The most they are expected to do is prevent extinction, if they work. And if they do not work . . . well, we'll just have to figure that out later. In my view, the current approach to HCPs is simply sowing the seeds for failure down the line. It is a strategy for tragedy as far as biodiversity is concerned.

What if, on the other hand, Congress wanted to get serious about the threats to the nation's biological resources? What might "real reform" look like? Herewith my version of a ten point program to maintain and restore healthy ecosystems.

### 1. *Eliminate Environmentally Damaging Subsidies*

The Worldwatch Institute estimates that the United States could save roughly \$125 billion per year by eliminating environmentally destructive subsidies.<sup>521</sup> The Friends of the Earth has identified about \$20 billion worth of tax breaks for polluters in the federal tax code.<sup>522</sup> By eliminating these harmful subsidies and tax breaks, Congress could save taxpayers money, and reduce environmental damage. Two for the price of one.

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PROCESS 205-24 (Tim W. Clark et al. eds. 1994).

<sup>519</sup> See *supra* notes 374 to 380 and accompanying text.

<sup>520</sup> See Habitat Conservation Plan Assurances ("No Surprises") Rule, 63 Fed. Reg. 8859, pmb1.

<sup>521</sup> See ROODMAN, *supra* note 194, at 38-39, tbl.2-2.

<sup>522</sup> See FRIENDS OF THE EARTH, DIRTY LITTLE SECRETS 8 (1995).

## 2. *Adopt the Tax Shift Strategy*

"In 1920, the Cambridge University economist Arthur Pigou proposed the idea of a tax as a way to bridge the gap between private and social cost which is at the root of most environmental damage."<sup>523</sup> But as old as the idea is, remarkably few countries have actually put "Pigouvian taxes" into practice.<sup>524</sup> The time is coming, however, when the pressure to relieve income tax burdens will make a tax shift more attractive. Of all the possible "green fees," taxing energy would probably be the most fruitful and beneficial.<sup>525</sup> For example, a tax on the carbon content of fuel would reduce one of the primary greenhouse gases.<sup>526</sup> Other examples include congestion fees to reduce automobile use and curb sprawl, fees on factory farms holding more than 200 animals; solid waste fees; and development fees on land outside growth boundaries.<sup>527</sup>

There are three basic problems that need to be overcome for green fees to work properly. First is a design problem: how should a tax be set to produce the desired behavioral change? Second is an equity problem: how can the regressive nature of some of these taxes be softened? And third is the obvious political problem: how can such an idea win the necessary support in Congress? To have any chance of winning political support, such taxes would have to be "revenue neutral," meaning that they must truly offset other taxes rather than simply increase the overall tax burden.

## 3. *Make Biodiversity Conservation the Primary Purpose of Federal Land Ownership and Management*

The multiple-use paradigm may have served the nation well during the era of settlement and development of the West, but it has outlived its usefulness. Today these lands, containing some of the "last best places"<sup>528</sup>

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<sup>523</sup> FRANCES CAIRNCROSS, *COSTING THE EARTH: THE CHALLENGE FOR GOVERNMENTS, THE OPPORTUNITIES FOR BUSINESS* 95 (1992). See Charles S. Pearson, *Testing the System: GATT + PPP = ?*, 27 *Cornell Int'l L.J.* 553, 559.

<sup>524</sup> See *id.* Examples of these countries include Sweden, Finland, Italy, Denmark, United States, and Norway. See *id.* at 96.

<sup>525</sup> See PAUL HAWKEN, *THE ECOLOGY OF COMMERCE: A DECLARATION OF SUSTAINABILITY* 179-89 (1993). See REPETTO ET AL., *supra* note 185, at 53-54.

<sup>526</sup> See REPETTO ET AL., *supra* note 185, at 54-56.

<sup>527</sup> See ROODMAN, *supra* note 194, at 180-83.

<sup>528</sup> See *THE LAST BEST PLACE* (William Kittridge ed., 1992).



in America, have more societal value as wilderness, watersheds, and reservoirs of biodiversity than they do as coalfields, oilfields, cattle pastures, and clearcuts.<sup>529</sup> Obviously, there is a human dimension to this problem. The transition from an economy based on extraction and liquidation to one based on principles of sustainability and ecological health cannot be accomplished overnight. Yet these are, after all, public lands, and if their conservation for biological purposes better serves the national interest then that is how they should be managed. This does not rule out commodity production, but it would restrict it to situations where it was compatible with the primary purpose of conserving biological diversity.

#### 4. *Create a Habitat Maintenance and Restoration Trust Fund*

Such a fund could be modeled on the "Superfund"<sup>530</sup> or the Highway Trust Fund,<sup>531</sup> which are dedicated funds that, unlike the Land and Water Conservation Fund,<sup>532</sup> are not subject to the vagaries and political shenanigans of the annual appropriations process. The Habitat Fund, created as part of the ESA, would be used to support a variety of conservation projects, including the kind of multi-species, regional planning efforts undertaken in Southern California and Austin, Texas.<sup>533</sup> For example, it could be the source of matching funds for state and private conservation projects. It could also serve as a real "safety net" under the HCP program, to provide a ready source of money to fund corrective actions when failures occur, and they *will* occur. Revenue for the fund could come from the savings from eliminating harmful subsidies, and/or from taxes and fees on waste and resource depletion. The level of funding must be commensurate what is needed to achieve recovery goals, including habitat acquisition and, in appropriate cases, compensation for restrictions on development.

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<sup>529</sup> *See id.*

<sup>530</sup> *See* Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. § 9601 *et seq.* (1994).

<sup>531</sup> *See* Highway Trust Fund, 26 U.S.C. § 9503 (1994).

<sup>532</sup> *See* Land and Water Conservation Fund Act of 1965, 16 U.S.C. § 4601-4 *et seq.* (1994).

<sup>533</sup> *See* TIMOTHY BEATLEY, HABITAT CONSERVATION PLANNING: ENDANGERED SPECIES AND URBAN GROWTH 54-68, 177-85 (1st ed. 1994).

### 5. *Make Recovery the Universal Compliance Standard Under the ESA.*

As discussed, the Services have made “survival” the *de facto* implementation standard under the ESA.<sup>534</sup> Survival is the test for making jeopardy determinations under section 7, and for issuing incidental take permits under section 10.<sup>535</sup> By setting the bar so low, the Services are insuring that species recovery will be problematic and slow. If recovery is the true goal, make it an enforceable standard. It is not enough to produce more recovery plans, as the Kempthorne Bill<sup>536</sup> promises, there must be actual recovery.

### 6. *Insure That All ESA Decisions Use “Good Science”*

Much criticism has been leveled at the ESA, particularly the listing process, for not using “good science.”<sup>537</sup> For example, the Kempthorne Bill would establish a formal “peer review” process for each proposed listing.<sup>538</sup> But too little attention has been paid to the need for better science in other aspects of the statute and agency implementation. For example, the National Research Council has recommended that Congress change the ESA’s definition of “species” to include distinct populations of invertebrates and plants because their exclusion from the current definition makes no scientific sense.<sup>539</sup> The fact that critical habitat has been designated for only one-fifth of all listed species<sup>540</sup> may be good politics but hardly represents good science. The lack of recovery plans for roughly half of all listed species, and the poor quality of many of the ones that do exist, does not reflect good science.<sup>541</sup> The findings of the Kareiva study of the HCPs being developed under Secretary Babbitt’s “user-friendly” policies shows that far too many plans would not even pass a basic biology

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<sup>534</sup> See *supra* notes 287 to 304 and accompanying text.

<sup>535</sup> See Endangered Species Act of 1973, 16 U.S.C. §§ 1536, 1539 (1994).

<sup>536</sup> See SENATE COMM. ON ENV'T. AND PUBLIC WORKS, ENDANGERED SPECIES RECOVERY ACT OF 1997, S. REP. NO. 105-128 (1997).

<sup>537</sup> See ENDANGERED SPECIES RECOVERY: FINDING THE LESSONS, IMPROVING THE PROCESS 33 (Tim W. Clark et al. eds., 1994) [hereinafter ENDANGERED SPECIES RECOVERY].

<sup>538</sup> See S. REP. NO. 128, *supra* note 496, at 13.

<sup>539</sup> See NRC REPORT, *supra* note 23, at 3-4.

<sup>540</sup> See ENDANGERED SPECIES RECOVERY, *supra* note 338, at 33.

<sup>541</sup> See generally Cheever, *supra* note 246.

exam.<sup>542</sup> And the “no surprises” rule is the very antithesis of good science.<sup>543</sup>

### 7. *Make “Effectiveness” Equal to “Fairness” in ESA Implementation*

By making “fairness” the touchstone of his administrative reform effort, Secretary Babbitt seems to have overlooked the equally important principle of effectiveness. Unless the species covered by HCPs are able to recover, the program will be a failure, no matter how “fair” it is. One way to improve the efficacy of HCPs is to build in adaptive management strategies that allow adjustments to be made as the need arises. The no surprises rule, of course, runs exactly counter to this approach.<sup>544</sup> Indeed, what may seem fair to the recipient of a no surprises assurance today may not seem too fair to the landowner tomorrow who may not be able to negotiate a favorable deal because the species has declined and the mitigation options are fewer.

### 8. *Strengthen the ESA's Affirmative Conservation Duty*

The Federal Government ought to set the example on how to take species conservation into account in carrying out its activities. That seems to be what Congress had in mind when it put the language in section 7(a)(1) directing all federal agencies to utilize their authorities to conserve listed species.<sup>545</sup> As discussed, however, the courts have not been very helpful in enforcing this requirement.<sup>546</sup> The Kempthorne Bill does contain a provision requiring agencies to prepare “implementation agreements” in concert with the Services, to implement the measures contained in recovery plans.<sup>547</sup> This is a worthwhile step, but the obligations will have to be spelled out with a specificity that makes them enforceable in court, or they will become just another “to do” that does not get done.

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<sup>542</sup> See generally Kacsukyoon, *supra* note 448.

<sup>543</sup> See generally Kostyack, *supra* note 205.

<sup>544</sup> See generally Habitat Conservation Plan Assurances (“No Surprises”) Rule, 63 Fed. Reg. 8859 (1998).

<sup>545</sup> See 16 U.S.C. § 1536(a)(1) (1994).

<sup>546</sup> See *supra* notes 265 to 277 and accompanying text.

<sup>547</sup> See S. REP. NO. 128, *supra* note 496, at 18-19.

### 9. *Strengthen Public Participation Requirements In The HCP Process*

History shows that the more active and involved the public is in the implementation of the ESA, and other environmental laws, the more likely it is that the requirements of those laws will be met.<sup>548</sup> Before citizens were authorized to petition for listings and go to court to force listing decisions, for example, the listing program had ground to a virtual standstill.<sup>549</sup> Unfortunately, the HCP program, while becoming more “user-friendly,” has become much less “citizen-friendly.”<sup>550</sup> HCPs are negotiated behind closed doors, and receive only superficial, after-the-fact public comment.<sup>551</sup> Neither citizens nor scientists attempting to conduct research on HCPs can get easy access to HCPs because there is no central repository.<sup>552</sup> It almost seems as if the agencies had something to hide. Congress should bring the HCP program out into the sunlight, and establish enforceable procedural requirements for citizen participation in HCP decisions.

### 10. *Repeal the No Surprises Rule*

And replace it with statutory authority to issue incidental take permits not to exceed ten years. Create a “permit shield” provision that provides appropriate protection from enforcement for permittees who are in compliance with their permit. Models for permit shield provisions can be found in the Clean Air Act,<sup>553</sup> and the Clean Water Act.<sup>554</sup> The basic principle should be that the assurances the permittee receives should be tied to the assurances that the species have of recovery. In short, the better the HCP, the better the guarantee that no more will be expected of the permittee, and vice versa.

## IX. CONCLUSION

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The biodiversity that surrounds us is the product of 3 billion years

<sup>548</sup> See Houck, *supra* note 234, at 892-920.

<sup>549</sup> See BEAN & ROWLAND, *supra* note 14, at 203-10.

<sup>550</sup> See Kostyack, *supra* note 205, at 27-28.

<sup>551</sup> See *id.* at 22-23.

<sup>552</sup> See *supra* notes 371 to 373 and accompanying text.

<sup>553</sup> See Clean Air Act, 42 U.S.C. § 7661c (1994).

<sup>554</sup> See Clean Water Act, 33 U.S.C. § 1342 (1994).

of evolution, yet at current extinction rates, humanity threatens to eradicate more than half of it within a few generations. In the words of Michael Soule, widely regarded as the “father of conservation biology:”

Never in 500 million years of terrestrial evolution has this mantle we call the biosphere been under such savage attack. Perhaps the hardest thing to grasp is the geological and historical uniqueness of the next few decades. There simply is no precedent for what is happening to the biological fabric of this planet and there are no words to express the horror felt by those who love nature. In our lifetimes the relentless harrying of habitats, particularly in the tropics, will reduce rain forests, reefs and savannahs to vulnerable and senescent vestiges of their former grandeur and subtlety. Perhaps even more shocking than the unprecedented wave of extinction is the cessation of the evolution of new species of large plants and animals—death is one thing, but an end to birth is something else. There is no escaping the conclusion that in our lifetimes, the planet will see a suspension, if not an end, to many ecological and evolutionary processes which have been uninterrupted since the beginnings of paleontological time.<sup>555</sup>

It does not have to be this way. We can change the economic and political systems that are driving this mass extinction phenomenon. The linear economic model that propelled the Industrial Revolution—“take-make-waste”—is not sustainable. It is not sustainable because it does not respect the limits of the earth’s carrying capacity, not with the current population of 6 billion, and certainly not with the billions more that will join us over the next few decades. The human economy is a subset of nature’s economy, not the other way around. Our economy must live within the rules of ecology if it is to survive. Carbon dioxide emissions cannot exceed carbon fixation capacity; soil erosion cannot exceed soil formation; deforestation cannot exceed reforestation; groundwater pumping cannot exceed recharge; fish harvests cannot exceed fish production; and species extinction cannot exceed species adaptation. Technology can mask and ameliorate the problems that these exceedances create, but in time they

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<sup>555</sup> THE SOUL OF NATURE 245 (Michael Tobias & Georgienne Cowan, eds. 1998).

will catch up to us, like bad checks from an overdrawn bank account. And time is growing short: the gap between what we need to do and what we are actually doing is getting wider with each passing year.

Albert Einstein once observed: "The world we have created today as a result of our thinking thus far has created problems which cannot be solved by thinking the way we thought when we created them." We need to rethink our place in this world and embrace Aldo Leopold's vision of the land as a community to which we belong rather than some inanimate thing that belongs to us.<sup>556</sup> Infused with that spirit we ought to be able to fashion laws and institutions to foster health, happiness, and prosperity for all.

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<sup>556</sup> Aldo Leopold, *Foreword to Sand County Almanac* in A SAND COUNTY ALMANAC, *supra* note 96, at x-xi.