FREE & GREEN: A NEW APPROACH TO ENVIRONMENTAL PROTECTION

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I. INTRODUCTION

There has been substantial environmental progress over the past several decades. Air and water quality, in particular, have improved, while the United States and other nations have reached unprecedented levels of prosperity. The apparent environmental successes of the past thirty to forty years, however, should not blind us to the deficiencies of the dominant approach to environmental protection. Today's environmental programs will not be able to continue the trend

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of environmental improvement. We have reached the limits of centralized environmental regulation. Indeed, in some cases we have already surpassed those limits and environmental programs themselves stand as the greatest obstacles to continued cleanup and conservation:

- The federal Superfund program,[1] created in 1980, was supposed to facilitate the rapid cleanup of abandoned hazardous waste sites. Instead, Superfund projects are plagued by excessive costs, litigation, paperwork, and delay. By 1996, the average Superfund cleanup took over a decade as cleanup costs escalated.[2] As of June 30, 1999, the Environmental Protection Agency ("EPA") claimed to have cleaned up half of the over 1,200 sites on the National Priorities List ("NPL")—the EPA's official list of the most hazardous waste sites—yet fewer than 200 had been actually taken off the list.[3] While Superfund is slow and costly, it is not at all clear that it does much to protect public health. According to one recent study, the target risk levels used for cleanups are more a function of politics than of scientific analysis.[4] Even accepting the EPA's overcautious assumptions, the mean cost per cancer case averted at a site is over $10 billion.[5] As if this were not bad enough for neighboring communities, fear of liability discourages local investment or redevelopment near designated sites. Instead, companies avoid these "brownfields" and increasingly opt to site facilities in rural or other undeveloped areas, increasing America's industrial footprint.[6]
- The Clean Air Act ("CAA")[7] mandates the use of various

1. "Superfund" is the common name of the Comprehensive Environmental Response, Cleanup, and Liability Act (CERCLA), 42 U.S.C. §§ 9601-74 (2000).

2. *See* GAO, *Superfund: Progress, Problems, and Future Outlook*, GAO/T-RCED-99-128, March 23, 1999, at 1.

3. *See* GAO, *Superfund: Half the Sites Have All Cleanup Remedies in Place or Completed*, GAO/RCED-99-245, July 1999, at 5.

4. *See* W. KIP VISCUSI & JAMES T. HAMILTON, ARE RISK REGULATORS RATIONAL? EVIDENCE FROM HAZARDOUS WASTE CLEANUP DECISIONS 22 (AEI Brookings Joint Ctr. Regulatory Studies, Working Paper No. 99-2, 1999).

5. *See id.* at 16.

6. *See generally* DANA JOEL GATTUSO, REVITALIZING URBAN AMERICA: CLEANING UP BROWNFIELDS (Competitive Enterprise Institute 2000) (describing the brownfield phenomenon).

7. 42 U.S.C. § 7401 *et seq.* (2000).

fuel additives in gasoline, including oxygenates, which increase the oxygen content of fuels. Congress included the oxygenate provisions to placate special interests, particularly the ethanol lobby.[8] Adding oxygenates to fuel increases the price of gasoline but does not do much to help clean the air. In some cases, oxygenates can reduce emissions of one pollutant at the expense of increasing another. Worse, the most widely used oxygenate, methyl tertiary butyl ether ("MTBE") has been linked to widespread water contamination.[9] In the state of Michigan alone, some 500 wells are contaminated with MTBE.[10] This is hardly the only time the CAA has produced perverse environmental results. Provisions in the 1977 legislative amendments, for example, were designed to benefit regional coal producers at the expense of their competitors, and air quality suffered as a result.[11]

- Enacted in 1973, the Endangered Species Act ("ESA")[12] was supposed to bring species back from the brink of extinction. Yet in nearly thirty years, fewer than thirty of over 1,000 domestic species have been taken off the endangered and threatened species lists. Of these, more have been delisted by reason of extinction than because of recovery due to the ESA's protections.[13] One problem is that regulatory protection for endangered species

8. For all the gory details of how the oxygenate provisions became law, see generally Jonathan H. Adler, *Clean Fuels, Dirty Air, in* ENVIRONMENTAL POLITICS: PUBLIC COSTS, PRIVATE REWARDS (Michael Greve & Fred Smith eds., 1992) [hereinafter ENVIRONMENTAL POLITICS].

9. *See* Ben Lieberman, *Running on MTBE: Closing the Pumps on the Oxygen Content Requirement*, CEI ONPOINT No. 50, *available at* http://www.cei.org/OnPointReader.asp?ID=833 (Oct. 29, 1999).

10. *See* David Mastio, *Legal, Scientific Attacks Hobble EPA*, DETROIT NEWS, May 8, 2000, at A1.

11. *See* BRUCE ACKERMAN & WILLIAM T. HASSLER, CLEAN COAL, DIRTY AIR (1981).

12. 16 U.S.C. § 1531 *et seq.* (2000).

13. *See* Robert E. Gordon, Jr., James K. Lacey & James R. Streeter, *Conservation Under the Endangered Species Act*, 23 ENV'T INT'L 359 (1997); *see also* Ike C. Sugg, *Caught in the Act: Evaluating the Endangered Species Act, Its Effects on Man and Prospects for Reform*, 24 CUMB. L. REV. 1, 42-44 (1993). It is worth noting that many of the alleged "successes" of the ESA are nothing of the kind and involve species that were either never in danger of extinction or were helped by exogenous factors. *See id.* (discussing the examples of the Palau dove, Palau fantail flycatcher, Palau owl, Rydberg milk-vetch, and American alligator).

> discourages habitat conservation on private land. Stringent land-use restrictions make ownership of endangered species habitats a liability instead of an asset. The presence of a listed species can freeze the use of private land, barring everything from home construction and timber cutting to farming and clearing firebreaks. Faced with this risk, landowners respond accordingly. Indeed, there is increasing evidence that landowners preemptively destroy potential habitat rather than risk federal regulation.[14]

These are but a few examples of the harms caused by existing environmental programs, each of which costs the American people billions of dollars per year. Taken as a whole, today's environmental regulations impose substantial costs and inequitable burdens, generate meager benefits, and divert resources from environmental efforts that could produce more significant gains.

This Article seeks to outline an alternative approach to environmental policy, one based on market institutions and property rights instead of central planning and bureaucratic control. In principle, this entails nothing less than a complete reorientation of existing environmental policy. The aim is both to improve environmental protection and to lessen the costs—economic and otherwise. It seeks to enhance environmental protection without sacrificing individual rights or economic liberty, to safeguard environmental values without expanding government control of Americans' lives, and to find solutions grounded in market institutions, not regulatory bureaucracies.

Part II of this Article diagnoses the problem with conventional approaches to environmental policy. It is not merely that existing regulations and programs are inefficient or overly bureaucratic. Rather, the failure of existing environmental strategies is the inevitable result of an outlook that views government regulation as the proper policy response to each and every activity that produces an environmental impact. This approach to environmental policy is a recipe for ecological central planning and is destined to fail.

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14. *See* Dean Lueck, *The Law and Politics of Federal Wildlife Preservation, in* POLITICAL ENVIRONMENTALISM: GOING BEHIND THE GREEN CURTAIN 107-10 (Terry L. Anderson ed., 2000) [hereinafter POLITICAL ENVIRONMENTALISM]; Sugg, *supra* note 13, at 43.

Part III provides a cursory outline of an alternative paradigm for environmental protection that is grounded in market institutions, particularly property rights. This vision is often referred to as "free market environmentalism." By focusing on institutions and the incentives that they create, this approach to environmental policy seeks to reconcile human demands for economic well-being, safety, and environmental protection by incorporating environmental resources and values into the marketplace, rather than regulating them outside economic institutions.

A new science of environmental protection will not, indeed cannot, be implemented overnight. Political and institutional change is necessarily incremental. With this in mind, Part IV outlines a series of principles that should guide those interested in a more efficient, effective, and equitable approach to environmental protection, and offers specific examples of policy reforms that can reconcile environmental protection and market institutions.

II. DIAGNOSING THE PROBLEM

A. The Call for Change

Environmental regulation imposes a large and growing burden on the United States economy. In 1999, environmental regulations cost an estimated $206 billion—over one-quarter of the total federal regulatory burden.[15] These costs are rarely readily apparent; rather, they are buried in the costs of products and services throughout the economy. Apparent or not, the pinch is real—over $2,000 for the average family of four in 1999.[16] These numbers will only increase in the years to come. In late 1999, the EPA's accounted for over ten percent of all new rules in the regulatory pipeline.[17] Of the 137 forthcoming major rules identified by the federal government in October 1999, the EPA accounted for twenty-eight, over twenty percent of the total, and more than any other federal

15. *See* CLYDE WAYNE CREWS, TEN THOUSAND COMMANDMENTS: AN ANNUAL POLICYMAKER'S SNAPSHOT OF THE FEDERAL REGULATORY STATE 4 fig.3 (3d ed. 2000) (figure in 1998 dollars).

16. *See id.*

17. *See id.* at 17 fig.13.

agency.[18]

Environmental regulations are certainly costly. The relevant question is whether they produce much in return. After all, if the benefits outweigh the costs, it may not be worth quibbling over the price tag. The EPA claims that many of its rules represent cost-effective approaches to pressing environmental concerns, but critics suggest otherwise.[19] Assessing the record is difficult due to the lack of consistent reporting by regulatory agencies of regulatory costs and benefits.[20] Moreover, it is difficult—if not impossible—to account accurately for the value of environmental protection, particularly in the context of unowned, i.e., "public," resources.[21]

There is no question that the early environmental laws seemed to work well.[22] Beginning in the 1960s, many indicators of environmental quality showed distinct improvement.[23] Some of these gains were likely due to the first generation of federal environmental regulation. The rest occurred due to state and local efforts or other extraneous factors.[24] The initial generation

18. *See id.* at 19 fig.15. "Major" rules are the most significant regulations—those that are estimated to cost over $100 million annually and classified as "economically significant." *Id.* at 18-19.

19. *See generally, e.g.*, Robert W. Crandall, Frederick H. Reuter & William A. Steger, *Clearing the Air: EPA's Self-Assessment of Clean Air Policy*, REG., Vol. 19, No.4, at 35 (1996) (critiquing the EPA's retrospective study of costs and benefits under the CAA); Craig S. Marxsen, *The Environmental Propaganda Agency*, IND. REV., Vol. V, No. 1 (2000) (same).

20. *See* CREWS, *supra* note 15, at 32-34; Robert W. Hahn et al., *Assessing Regulatory Impact Analyses: The Failure of Agencies to Comply with Executive Order 12,866*, 23 HARV. J.L. & PUB. POL'Y 859, 865-77 (2000).

21. *See, e.g.*, Donald J. Boudreaux, Roger E. Meiners & Todd J. Zywicki, *Talk Is Cheap: The Existence Value Fallacy*, 29 ENVTL. L. 765 (1999).

22. The record, however, is clearly mixed. For instance, "none of the available data" are able to demonstrate that water quality nationwide is demonstrably better than it would have been absent the Clean Water Act. A. Myrick Freeman III, *Water Pollution Policy, in* PUBLIC POLICIES FOR ENVIRONMENTAL PROTECTION 97, 114 (Paul Portney ed., 1990); *see also* Roger E. Meiners & Bruce Yandle, *Clean Water Legislation: Reauthorize or Repeal?, in* TAKING THE ENVIRONMENT SERIOUSLY 73, 86-87 (Roger E. Meiners & Bruce Yandle eds., 1993).

23. *See generally, e.g.*, BORIS DEWEIL, STEVEN HAYWARD, LAURA JONES & M. DANIELLE SMITH, INDEX OF LEADING ENVIRONMENTAL INDICATORS FOR THE U.S. AND CANADA (1997) (documenting improvement in many environmental indicators over the past several decades).

24. For example, available air quality data indicates that emissions of at least some air pollutants declined more rapidly *before* the onset of federal air quality regulation. This case is made quite extensively in INDUR GOKLANY, CLEARING THE AIR (1999). Goklany discusses EPA data showing particulate emission reductions to be significantly greater in the 1960s than after the CAA took affect. "These data also call into question one of the fundamental premises behind the [CAA]: that

of environmental policy was effective principally because it was plucking low-hanging fruit; removing lead from gasoline and preventing the disposal of raw sewage in rivers were relatively easy issues to address. Environmental problems were obvious and economical policy measures were readily available. Not so any more.

Today few low-hanging fruit remain, and the existing regulatory system is ill-equipped, if not constitutionally unable, to reach any higher.[25] As regulations tighten, they yield diminishing marginal returns. In 1997, the EPA proposed a further tightening of national ambient air quality standards for ozone ("smog") and particulate matter ("soot"). Independent analysts estimated the new rules could cost as much as $90 to $150 billion per year to implement.[26] By the EPA's own estimates, the costs of the new ozone standard would exceed the benefits.[27] One reason is that all of the relatively inexpensive control measures have been adopted. For example, under current federal regulations, a new car produced in 2000 emits over 90 percent fewer emissions than a car produced just a few decades ago.[28] There is not much more to be gained by tightening these standards even further.

Continuing to press for further incremental gains is increasingly expensive and, in some cases, results in net environmental harm.[29] For instance, when reviewing the EPA's

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states and local governments never would impose the controls necessary to achieve healthful air." Paul Portney, *Air Pollution Policy, in* PUBLIC POLICIES FOR ENVIRONMENTAL PROTECTION 98 (Paul Portney ed., 2d ed. 2000).

25. For a discussion of some of the constitutional limits to federal environmental regulation, see Jonathan H. Adler, Comment, *The Green Aspects of* Printz*: The Revival of Federalism and Its Implications for Environmental Law*, 6 GEO. MASON L. REV. 573 (1998) (outlining the potential impact of *Printz v. United States* and other federalism decisions on federal environmental regulation).

26. *See* ANNE E. SMITH ET AL., COSTS, ECONOMIC IMPACTS, AND BENEFITS OF EPA'S OZONE AND PARTICULATE STANDARDS (Reason Pub. Policy Inst., Policy Study No. 226, 1997).

27. *See* U.S. EPA Office of Air Quality Planning and Standards Innovative Strategies and Economics Group, Regulatory Impact Analysis for Proposed Ozone National Ambient Air Quality Standard (Research Triangle Park, N.C., December 1996); *see also* Susan E. Dudley & Wendy L. Gramm, *EPA's Ozone Standard May Harm Public Health and Welfare*, 17 RISK ANALYSIS 403 (1997).

28. *See* K.H. Jones & Jonathan Adler, *Time to Reopen the Clean Air Act: Clearing Away the Regulatory Smog*, POLICY ANALYSIS NO. 233, tbl.7 (Cato Institute, 1995), *available at* http://www.cato.org/pubs/pas/pa-233.html.

29. *See generally* David Mastio, *EPA Adapts to New Environmental Challenges*, DETROIT NEWS, May 9, 2000, at A1 (reporting observation of Paul Portney, President of Resources for the Future, that "[a]s the agency attacks smaller problems, the danger is that some of the consequences of environmental

proposed revisions to national air quality standards, the Court of Appeals for the D.C. Circuit found that the EPA ignored evidence that further tightening the ozone standard could have *negative* impacts on public health.[30] Today's hyper-stringent environmental regulations are themselves substantial barriers to ecological conservation and pollution reduction in many sectors of the economy. Newer technologies are often subject to more stringent environmental regulations despite their potential to reduce environmental impacts. As the Clinton Administration noted in its report *Reinventing Environmental Regulation*: "Prescriptive regulations can be inflexible, resulting in costly actions that defy common sense by requiring greater costs for smaller returns. This approach can discourage technological innovation that can lower the costs of regulation or achieve environmental benefits beyond compliance."[31]

These problems in environmental policy have gradually produced a consensus on the need for significant reform. With few exceptions, environmental analysts recognize that changes must be made in order for environmental gains to continue into the twenty-first century. "The EPA's programs need some major rethinking, and they're not getting it," observes Terry Davies of Resources for the Future.[32] According to the United States Advisory Commission on Intergovernmental Relations, "federal rules and procedures governing decisionmaking for protecting the environment often are complex, conflicting, difficult to apply, adversarial, costly, inflexible, and uncertain."[33] Analysts at the Progressive Policy Institute, a think tank affiliated with the Democratic Leadership Council,

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protection will be as bad or worse than the original problem we were trying to solve").

30. Am. Trucking Ass'ns, Inc. v. EPA, 175 F.3d 1027, 1051 (D.C. Cir. 1999), *aff'd in part, rev'd in part*, Whitman v. Am. Trucking Ass'ns, Inc., 121 S. Ct. 903 (2001). The Court of Appeals for the D.C. Circuit held that the EPA's refusal to consider the radiation-blocking potential of tropospheric ozone violated the Clean Air Act. *Id.* at 1051-53; *see also* Randall Lutter & Christopher Wolz, *UV-B Screening by Tropospheric Ozone: Implications for the National Ambient Air Quality Standard*, 31 ENVTL. SCI. & TECH. 142A, 145A (1997) (documenting likely rise in UV-B exposure due to reductions in tropospheric ozone).

31. William J. Clinton & Albert Gore, *Reinventing Environmental Regulation*, NAT'L PERFORMANCE REV., Mar. 1995, at 2.

32. Mastio, *supra* note 10.

33. U.S. ADVISORY COMMISSION ON INTERGOVERNMENTAL RELATIONS, A-122, INTERGOVERNMENTAL DECISIONMAKING FOR ENVIRONMENTAL PROTECTION AND PUBLIC WORKS 1 (1992), *cited in* Robert V. Percival, *Environmental Federalism: Historical Roots and Contemporary Models*, 54 MD. L. REV. 1141, 1165 (1995).

note that existing environmental regulations "are increasingly inefficient in a fast-paced economy and too rigid" to address modern environmental concerns.[34] "The current system, consisting mainly of end-of-pipe, technology-based regulations, is inadequate for the challenges ahead," observes Karl Hausker who oversaw the Enterprise for the Environment project, an effort to develop a consensus on environmental reform.[35] Most analysts agree on the need for change, if not on the kinds of change required.

B. The Failure of Central Ecological Planning

Conventional environmental policymaking presupposes that only government action can improve environmental quality. In this view, environmental problems arise from "market failures" that produce "externalities." Government regulation is needed to correct environmental concerns that the market has failed to handle because they are "external" to the price signals that regulate marketplace transactions. To say that the market has failed simply means that human activity has generated an environmental impact that is not accounted for in the price of that activity. Thus, the conventional paradigm of environmental policy justifies the regulation of all activities—from driving a car to turning on a light bulb—that have an impact on the environment that is not factored into the cost of the product or service. Economic central planning may be intellectually and historically discredited, but the "market failure" thesis justifies environmental regulatory control of just about everything. As a result, current regulations tell landowners where they can build a home or plant a garden and instruct businesses on how best to manufacture goods and handle byproducts. Indeed, the federal government has passed environmental regulations governing everything from the chemical composition of gasoline[36] to the design of home

34. Debra S. Knopman & Marc K. Landy, *A New Model of Governance*, BLUEPRINT, Fall 2000, *available at* http://www.ppionline.org/ndol (last visited Feb. 17, 2001).

35. Karl Hausker, *Reinventing Environmental Regulation: The Only Path to a Sustainable Future*, 29 ENVTL. L. REP. 10148, 10148 (1999).

36. *See, e.g.*, 42 U.S.C. § 7545(k) (2000) (directing the EPA to "promulgate regulations under this section establishing requirements for reformulated gasoline to be used in gasoline-fueled vehicles in specified nonattainment areas").

appliances, including washing machines and toilets.[37] As environmental analyst Richard Stewart observed, "the system has grown to the point where it amounts to nothing less than a massive effort at Soviet-style planning of the economy to achieve environmental goals."[38]

The dilemma for policy makers is that ecological central planning cannot succeed any better than its economic cousin. Indeed, the likelihood of long-term success is even less in the environmental context; planning the "production" of air quality or other ecological "goods" is orders of magnitude more complex than planning the production of shoes or wheat. Centralized regulatory agencies are ill-equipped to handle the myriad ecological interactions triggered or impacted by private activity. No doubt the first generation of environmental regulations produced some significant gains—just as the Soviet economies once appeared productive.[39] Over time, however, every centrally planned economy collapsed under its own weight. As centralized environmental regulations reach their limit, they too begin to falter.

In the Soviet system, further gains in production were achieved for a time through the reliance upon tradable quotas and other efforts to design a "market socialist" system.[40] Similar proposals are forwarded today to add market incentives to the existing regulatory infrastructure. Nonetheless, most environmental analysts recognize that federal regulatory policies are too costly and ineffective and cannot be relied upon into the future.[41] The problem is not merely one of regulatory design; it lies at the core of the current environmental

37. *See* Energy Policy Act of 1992, Pub. L. 102-486, § 123, 106 Stat. 2817, 2817-32 (1992) (setting water efficiency standards for toilets); *see also* Energy Conservation Program for Consumer Products: Clothes Washer Energy Conservation Standards, 65 Fed. Reg. 59,550-01 (2000) (to be codified at 10 C.F.R. pt. 430) (notice of proposed rulemaking on water efficiency standards for washing machines).

38. Richard B. Stewart, *Controlling Environmental Risks Through Economic Incentives*, 13 COLO. J. INT'L ENVTL. L & POL'Y 153, 154 (1988).

39. Some, such as John Kenneth Galbraith, were celebrating the alleged success of the Soviet economic system into the 1980s. *See, e.g.*, John Kenneth Galbraith, *Reflections: A Visit to Russia*, THE NEW YORKER, Sept. 3, 1984, at 54, 65 (claiming that "the Russian system succeeds because in contrast to the Western industrial economy it makes full use of its manpower").

40. *See* Paul Georgia, *Owning the Unownable*, *in* ECOLOGY, LIBERTY & PROPERTY: A FREE MARKET ENVIRONMENTAL READER (Jonathan H. Adler ed., 2000).

41. *See, e.g.*, Hausker, *supra* note 35, at 10148 (arguing that environmental regulation must be reinvented to ensure sustainability).

approach.

Under the conventional approach to environmental policy, federal regulators who are located in or at least are responsible to Washington identify the greatest environmental concerns for the nation as a whole. Next they must identify the causes of these problems, and the proper solutions. Regulatory strictures must be designed to account for the myriad differences between industries, communities, and ecosystems. Monitoring and compliance systems must be developed to ensure that standards are met and dictates are obeyed. Because the federal government itself cannot be trusted, additional measures are necessary, including strict legislative deadlines, private "citizen suit" provisions that can force the government's hand, and "parallel" liability systems to impose additional costs upon noncompliant firms.[42] It does not end there. As circumstances change, the whole system must be revised to take into account new factors by incorporating new environmental threats into the system without forgetting to address the old.

Such a system cannot work because each and every step requires more information than can be realistically gathered or processed. Environmental problems are not uniform, nor are their solutions. The carrying capacity of a given pasture or stream or the vulnerability of a given ecosystem to disruption changes with time and place. One river may suffer from excessive nutrient loads, another from a deficiency. Smog in one city may be due to exorbitant levels of nitrogen oxide ("NOx"); in another, NOx controls may actually increase smog formation.[43] As a result, centralized environmental regulation is inherently limited by "the inability of central planners to gather and process the information needed to write directives appropriately responsive to the diverse and changing conditions of different economic actors; and the failure of central planning commands to provide the necessary incentives and flexibility for environmentally and economically beneficial innovation."[44]

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42. Richard B. Stewart, *United States Environmental Regulation: A Failing Paradigm*, 15 J.L. & COM. 585, 586-87 (1996).

43. This is because smog formation is largely determined by the ratio of NOx to hydrocarbons in the ambient air. Meteorlogical conditions can also play a substantial role.

44. Stewart, *supra* note 42, at 587.

Governmental institutions are also heavily resistant to change. Legislatures struggle to reach consensus, and bureaucratic agencies burrow into ruts that keep them on courses long past their usefulness.[45] Indeed, programs can survive long after it is demonstrated that they cause more harm than good. The world has changed dramatically in the past three decades, and yet the environmental regulatory framework in place in 2000 is much the same as it was in 1970. Most of the changes have merely been the addition of levels to the administrative layer cake rather than reinventions or reorientations of programs and initiatives.

For many years political scientists held out the hope that "scientific management" by the best and brightest could address environmental concerns.[46] It was postulated that well-intentioned experts could succeed where markets failed. No such luck. "If qualified managers with good intentions were sufficient to ensure sound decisionmaking, Yellowstone would be the Eden of the national parks."[47] Instead, Yellowstone National Park is grossly mismanaged—"[r]ather than preserved, it is being destroyed."[48] Public management, or rather *political* management, is failing. No matter how well-intentioned the public official, the incentives she faces run contrary to sound resource management.[49] If a forest manager improves management or saves money on timber sales, she risks a smaller appropriation in the next Congress. If a park ranger solves an ecological problem in a National Park, she risks losing resources to more "urgent" problems.

In his landmark study of bureaucracy, James Q. Wilson observed that "[t]here is a kind of Gresham's law at work in

45. LUDWIG VON MISES, LIBERALISM IN THE CLASSICAL TRADITION, 102 (3d. ed. 1985) ("[B]ureaucratic management in any case continues to suffer from the unwieldiness and the lack of ability to adjust itself to changing conditions that have everywhere led public enterprises from one failure to another.").

46. *See generally* ROBERT H. NELSON, PUBLIC LANDS AND PRIVATE RIGHTS (1995) (documenting the development and eventual failure of "scientific management" of federal lands).

47. Michael Copeland, *The New Resource Economics, in* THE YELLOWSTONE PRIMER 13 (John A. Baden & Donald Leal eds., 1990).

48. ALSTON CHASE, PLAYING GOD IN YELLOWSTONE 6 (1987). For a similar indictment of federal management of Rocky Mountain National Park, see generally KARL HESS, ROCKY TIMES AT ROCKY MOUNTAIN NATIONAL PARK (1993).

49. *See* VON MISES, *supra* note 45, at 102 ("[M]anagers, as functionaries of the state, do not have the personal interest in the success or failure of the business that is characteristic of the management of private enterprises.").

many government bureaus: Work that produces measurable outcomes tends to drive out work that produces unmeasurable outcomes."[50] On federal lands, this means that things like dollars spent, road-miles built or—in days gone by—acres cut displaces a focus on the health of the land and ecological values. Similarly, in the EPA's Office of Enforcement and Compliance Assurance, the number of criminal convictions and amount of fines issued are more important than the actual amount of cleanup achieved.[51]

Given the incentives faced by bureaucracies, high profile actions tend to drive out less flashy, but arguably more important measures. Thus, a President can burnish his environmental credentials by unilaterally ordering National Monument designations while federal lands languish due to shortfalls in budgets for maintenance and other routine expenditures. The Secretary of the Interior can grab the front page by announcing measures to protect the bald eagle or some other charismatic megafauna, while less attractive but no less important species receive little support.[52] Put another way, "bureaucrats also tend to favor programs with visible benefits and invisible costs."[53] This can make for good politics, but it does not advance environmental protection.

If public sector management places environmental resources at the mercy of public sector employees and the incentives they face, it also makes such resources vulnerable to special interest groups that seek to use government power to their advantage. Attempts "to gain a competitive advantage through manipulation of the regulatory process" are "occurring with increasing frequency," according to former Environmental Protection Agency Deputy Administrator A. James Barnes.[54] This inefficient interference by special interests, known as

50. JAMES Q. WILSON, BUREAUCRACY 155 (1989).

51. *See* Jonathan H. Adler, *Bean Counting for a Better Earth: Environmental Enforcement at the EPA*, REG., Spring 1998, at 40-48.

52. *See* Don Coursey, *The Revealed Demand for a Public Good: Evidence from Endangered and Threatened Species*, 6 N.Y.U. ENVTL. L.J. 411 (1998) (noting wide disparity in money spent to recover different endangered species).

53. Copeland, *supra* note 47, at 17-18; *see also* Terry L. Anderson, *The New Resource Economics: Old Ideas and New Applications*, AM. J. AGRIC. ECON., Dec. 1982, at 929.

54. A. James Barnes, *How to Milk EPA's Smog Rules for Fun and Profit*, SAC. BEE, Mar. 30, 1994, at B7.

"rent-seeking," is facilitated by the fact that firms have the ability to receive concentrated benefits through government action, whereas the costs are dispersed throughout the whole of society.[55] In the regulatory context, rent-seeking typically consists of pursuing those government interventions that will provide comparative advantage to a particular industry or subsector. By restricting entry or reducing output, regulations can serve to reduce competition and cartelize an industry and potentially increase returns.

Rent-seeking has become rather pervasive in regulatory programs—provisions that benefit specific politically influential interests are relatively easy to hide from public scrutiny in the Code of Federal Regulations. Environmental regulation is a particularly attractive venue for rent-seeking because environmental protection is so popular.[56] Special interest policies become more politically palatable when given a green veneer. In other cases, existing regulations are tweaked to advantage one firm or industry over another. Yet as environmental policies get manipulated to serve narrow interests, their ability to meet environmental goals is compromised, if not sacrificed altogether. To take one prominent example, the EPA proposed changes to the reformulated gasoline program in 1994 to increase the use of "renewable" fuel sources by mandating that a minimum percentage of oxygen-enhancing fuel additives from ethanol or ethanol-derived sources. This rule would have done nothing to improve environmental quality. Indeed, the EPA "even conceded that use of ethanol might possibly make air quality worse."[57] The EPA knew the problems with the rule, but

55. *See generally* Todd J. Zywicki, *Environmental Externalities and Political Externalities: The Political Economy of Environmental Regulation and Reform*, 73 TUL. L. REV. 845 (1999) (describing the phenomenon of rent-seeking in environmental policy).

56. *See* C. Ford Runge, *Trade Protectionism and Environmental Regulations: The New Nontariff Barriers*, 11 NW. J. INT'L L. & BUS. 47, 47 (1990) ("Because environmental standards have a growing national constituency, they are especially attractive candidates for disguised protectionism."); *see also* Robert E. McCormick, *A Review of the Economics of Regulation: The Political Process*, *in* REGULATION AND THE REAGAN ERA: POLITICS, BUREAUCRACY AND THE PUBLIC INTEREST 27-28 (Roger E. Meiners & Bruce Yandle eds., 1989) ("There is abundant evidence in the economics literature that when the flag of public interest is raised to support regulation, there is always a private interest lurking in the background.").

57. 59 Fed. Reg. 39,268 (1994), *cited in* Am. Petroleum Inst. v. EPA, 52 F.3d 1113,

pushed ahead anyway. Why? Because the ethanol lobby would benefit.[58] Unfortunately, this is hardly an isolated example.[59] Worse, as the pages in the *Federal Register* devoted to environmental regulation proliferate, so will the opportunities and incentives for rent-seeking.

III. PROPERTY-BASED ENVIRONMENTAL PROTECTION: THE FREE MARKET ALTERNATIVE

The problem with the dominant approach to environmental policy is its reliance upon centralized political mechanisms. The limitations of such mechanisms—whether regulations, fiscal instruments, or direct management of environmental resources—hamper the effectiveness of existing environmental programs. As environmental problems become ever more complex, these limitations will only become more severe. The answer is not greater government control or manipulation of the marketplace, but a greater reliance upon property rights and voluntary arrangements. By encouraging a more efficient use of resources, responsible stewardship, and technological innovation, property rights in environmental resources provide a sounder foundation for the advancement of environmental values than the modern regulatory state.

Property-based environmental protection—commonly referred to as "free market environmentalism"[60] or "FME"—rejects the "market failure" model. "Rather than viewing the world in terms of market failure, we should view the problem of externalities as a *failure to permit markets* and create markets where they do not yet—or no longer—exist."[61] Where

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1119 (1995) (invalidating EPA-reformulated gasoline regulations due to lack of statutory authority).

58. *See* John Dillin, *EPA Stirs Debate on Benefits of Ethanol Fuel Additive*, CHRISTIAN SCI. MONITOR, June 30, 1994, at 1 (reporting on EPA Administrator Carol Browner's and Agriculture Secretary Mike Espy's explicit acknowledgment that the rule was issued in part to assuage the concerns of the ethanol industry). *See generally* Adler, *supra* note 8 (providing a history of the reformulated gasoline program and the pervasive role of the special interest politics in it).

59. *See generally* ENVIRONMENTAL POLITICS, *supra* note 8 (documenting examples of rent-seeking in environmental policy); POLITICAL ENVIRONMENTALISM, *supra* note 14 (same); Zywicki, *supra* note 55 (same).

60. *See* TERRY L. ANDERSON & DONALD R. LEAL, FREE MARKET ENVIRONMENTALISM (1991). For additional formulations of free-market environmentalism, see ECOLOGY, LIBERTY & PROPERTY: A FREE MARKET ENVIRONMENTAL READER (Jonathan H. Adler ed., 2000); BRUCE YANDLE, COMMON SENSE AND COMMON LAW FOR THE ENVIRONMENT (1997).

61. Fred L. Smith, Jr., *Conclusion: Environmental Policy at the Crossroads, in*

environmental problems are most severe it is typically a *lack* of markets, in particular a lack of enforceable and exchangeable property rights, that is to blame. Resources that are privately owned or managed and therefore are incorporated into market institutions are typically well-maintained. Environmental problems, therefore, are "essentially property rights problems" which are solved by the extension, definition, and defense of property rights in environmental resources.[62]

Resources that are unowned or politically controlled, on the other hand, are more apt to be inadequately managed. In his seminal essay on the "tragedy of the commons,"[63] Garrett Hardin gave an illustration of this principle, stating that there is no incentive for any individual to protect the commonly owned grazing pasture in a rural village. Indeed, it is in every shepherd's self-interest to have his herd overgraze the pasture and before any other herd. Every shepherd who acquires additional livestock gains the benefits of a larger herd, while the cost of overusing the pasture is spread across all members of the village. The benefits of increased use are concentrated, while the costs are dispersed. Inevitably, the consequence is an overgrazed pasture, and everyone loses. The shepherd with foresight, who anticipates that the pasture will become barren in the future, will not exercise forbearance. Quite the opposite: he will have the added incentive to overgraze now to capture gains that otherwise would be lost. Refusing to add another animal to one's own herd does not change the incentive of every other shepherd to do so.

The world's fisheries offer a contemporary example of the tragedy of the commons. Because oceans are unowned, no fishing fleet has an incentive to conserve or replenish the fish it takes, but each has every incentive to take as many fish as possible lest the benefits of a larger catch go to someone else.[64] Efforts to control access through prescriptive regulations do

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ENVIRONMENTAL POLITICS, *supra* note 8, at 192.

62. Peter J. Hill & Roger E. Meiners, *Property Rights and Externalities: Problems and Solutions, in* WHO OWNS THE ENVIRONMENT? xi (Peter J. Hill & Roger E. Meiners eds., 1998); *see also* ANDERSON & LEAL, *supra* note 60, at 3 (stating that "[a]t the heart of free market environmentalism is a system of well-specified property rights to natural resources").

63. Garrett Hardin, *The Tragedy of the Commons*, 168 SCI. 1243 (1968).

64. *See* MICHAEL DE ALESSI, FISHING FOR SOLUTIONS 14 (IEA Environment Unit 1998).

relatively little to change this equation.[65] Shorten the fishing season, and the fishing merely becomes more intense. Limit the use of certain gear, and fishermen will simply employ more hands to maximize the catch. Private ownership overcomes the commons problem because owners can prevent overuse by controlling access to the resource. As Hardin noted, "The tragedy of the commons as a food basket is averted by private property, or something formally like it."[66] In the case of fisheries, the creation of property rights, whether in fisheries themselves or portions of a given catch, promotes sustainable fishing practices.[67] With property rights, the incentives faced by fishing fleets are aligned with the long-term sustainability of the underlying resource. As conservation scholar R.J. Smith explains:

> Wherever we have exclusive private ownership, whether it is organized around a profit-seeking or nonprofit undertaking, there are incentives for the private owners to preserve the resource. . . . [P]rivate ownership allows the owner to capture the full capital value of the resource, and self-interest and economic incentive drive the owner to maintain its long-term capital value.[68]

For incentives to work, the property right to a resource must be definable, defendable, and divestible. Where property rights are insecure, owners are less likely to invest in improving or protecting a resource. In many tropical nations, for example, the lack of secure property rights encourages deforestation as there is no incentive to maintain forest land, let alone invest in replanting.[69] Where existing environmental regulations undermine the security of property rights, they discourage conservation. The foremost example of this is the ESA, which effectively punishes private landowners for owning habitat of endangered species by restricting land-use. As Sam Hamilton, former Fish and Wildlife Service administrator for the State of Texas, noted, "The incentives are wrong here. If I have a rare metal on my property, its value goes up. But if a rare bird

65. *See id.* at 31-35.

66. Hardin, *supra* note 63, at 1243.

67. *See* DE ALESSI, *supra* note 64, at 68-74.

68. Robert J. Smith, *Resolving the Tragedy of the Commons by Creating Private Property Rights in Wildlife*, 1 CATO J. 439, 456 (1981).

69. *See* Roger A. Sedjo, *Forests: Conflicting Signals*, *in* THE TRUE STATE OF THE PLANET 177, 204 (Ronald Bailey ed., 1995) [hereinafter TRUE STATE].

occupies the land, its value disappears."[70] This economic reality creates a powerful incentive for landowners to destroy present or potential habitat on private land. Thus, in North Carolina, timber owners are dramatically shortening their cutting rotations and cutting trees at a much younger age—at significant economic cost—so as to avoid regulatory proscriptions that could force them to lose their investments altogether.[71]

To maximize the incentives for long-term sustainability, owners must also be free to transfer their property rights to others. Where rights are transferable, even someone indifferent or hostile to environmental protection has an incentive to take environmental concerns into account, because despoiling the resource may reduce its value in the eyes of potential buyers. Cars and homes that are privately owned are cared for better than those that are rented. The role of government is to protect property rights for environmental resources and enforce the voluntary agreements property owners contract to carry out.

The creation of secure property rights necessarily entails protecting property from private harm, such as that caused by pollution. This is inherent in the idea of property. "Property rights govern who has the right to use the environment in which ways, and who has the duty to respect others' rights."[72] To harm someone's property by polluting it is no more acceptable than to harm that property by vandalizing it. Thus landowners used common law doctrines of nuisance and trespass to defend against pollution for many years.[73] While

70. Betsy Carpenter, *The Best-Laid Plans*, U.S. NEWS & WORLD REP., October 4, 1993, at 89.

71. *See* Lueck, *supra* note 14, at 107-10.

72. ELIZABETH BRUBAKER, PROPERTY RIGHTS IN THE DEFENCE OF NATURE 18 (1995).

73. *See id. See generally* CTR. PRIVATE CONSERVATION, THE COMMON LAW APPROACH TO POLLUTION PREVENTION: A ROUNDTABLE DISCUSSION (1998); THE COMMON LAW AND THE ENVIRONMENT: RETHINKING THE STATUTORY BASIS FOR MODERN ENVIRONMENTAL LAW (Roger E. Meiners & Andrew P. Morris eds., 2000) [hereinafter COMMON LAW AND ENVIRONMENT]; YANDLE, *supra* note 60; Meiners & Yandle, *Clean Water Legislation: Reauthorize or Repeal?*, *in* TAKING THE ENVIRONMENT SERIOUSLY, *supra* note 22, at 88-93; Roger Meiners & Bruce Yandle, *Common Law and the Conceit of Modern Environmental Policy*, 7 GEO. MASON L. REV. 923 (1999); Roger Meiners & Bruce Yandle, *Common Law Environmentalism*, 94 PUB. CHOICE 99 (1998); Roger E. Meiners, *Elements of Property Rights: The Common Law Alternative*, *in* LAND RIGHTS: THE 1990S' PROPERTY RIGHTS REBELLION (Bruce Yandle ed., 1995); Todd J. Zywicki, *A Unanimity-Reinforcing Model of Efficiency in the Common Law: An Institutional Comparison of Common Law and Legislative Solutions to Large Number Externality Problems*, 46 CASE W. RES. L. REV. 961 (1996).

common law principles no longer form the basis of pollution control efforts in the United States, these doctrines still provide robust protection for water quality in rivers and streams in parts of England.[74] For property rights to serve environmental goals, it is essential to apply common-law-style liability rules to pollution problems.[75]

Whether a free market paradigm for environmental protection is better or worse than the "market failure" paradigm is an empirical question;[76] "the real comparison one must make in contemplating a regulatory intervention is that between an admittedly imperfect market and what will inevitably be imperfect regulation."[77] While reliance upon market institutions will not lead to ecological paradise, the empirical evidence shows quite clearly that ecological concerns are better cared for when incorporated into market institutions through property rights and exchange than left dependent upon government beneficence for protection.

If private markets were a greater threat to environmental protection, one would expect government agencies to do a better job at protecting environmental values than private actors. Indeed one might even expect environmental quality to correlate with government intervention in the economy. Yet the opposite is the case. Private ownership of ecological resources, for all its faults, outperforms political management. While some critics charge that private owners are short-sighted, private firms devote significantly greater resources to maintaining the value of their capital stock.[78] The more political institutions seek to replicate the incentive structures inherent in private ownership, the more reliable and responsible ecological

74. *See* Roger Bate, *Protecting English and Welsh Rivers: The Role of the Anglers' Conservation Association, in* COMMON LAW AND ENVIRONMENT, *supra* note 73, at 86-87.

75. For a discussion of how common law rules can be used to protect property rights in environmental resources, see Jonathan H. Adler, *Stand or Deliver: Citizen Suits, Standing and Environmental Protection*, 10 DUKE ENVTL. L. & POL'Y F., at Part IV (forthcoming 2001).

76. It can also be seen as an ethical question. *See* Paul Heyne, *Economics, Ethics, and Ecology, in* TAKING THE ENVIRONMENT SERIOUSLY, *supra* note 22, at 25-47.

77. Paul R. Portney, *EPA and the Evolution of Federal Regulation, in* PUBLIC POLICIES FOR ENVIRONMENTAL PROTECTION 16 (Paul R. Portney & Robert N. Stavins eds., 2d ed. 2000).

78. *See* Richard L. Stroup & Sandra L. Goodman, *Property Rights, Environmental Resources, and the Future*, 15 HARV. J.L. & PUB. POL'Y, 427, 440-43 (1992) (comparing public and private mass transit services).

management becomes.

While the U.S. is the world's greatest timber producer, it is also experiencing tremendous forest regrowth.[79] Each of the six national timber inventories conducted between 1952 and 1991 found greater forest volume than the one before.[80] The lion's share of this regeneration is occurring on private land.[81] Private timberlands account for approximately eighty-five percent of total tree planting and seeding.[82] Some timber companies also make investments in wildlife management and recreation to generate income in the decades between cutting rotations.[83] Private timberlands are not perfect, of course. Yet they compare quite favorably with their politically managed counterparts.

The federal government owns approximately one-third of the United States[84]—one of every three acres—and much of it is the worse for wear. Forest Service analysts warned for years of the impending buildup of fuel in the national forests, yet nothing was done. The record-setting wildfires throughout the western United States in 2000 were the inevitable result of this mismanagement.[85] The forests are not the only lands being neglected, though. The National Park Service faces a maintenance backlog in excess of $12 billion.[86] Improper wildlife management in Yellowstone and Rocky Mountain National Parks has led to overgrazing, increasing risks to biodiversity.[87] Yet a lack of resources is not the problem. Federal land management expenditures, measured in dollars per acre, have more than tripled since 1962.[88]

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79. *See* Sedjo, *supra* note 69, at 189-90.

80. *See id.* at 185.

81. *See* Jonathan H. Adler, *Poplar Front: The Rebirth of America's Forests, in* ECOLOGY, LIBERTY & PROPERTY 65, 72 (Jonathan H. Adler ed., 2000) (citing U.S. Forest Service report that found increasing timber volume for all ownerships save national forests).

82. *See* Sedjo, *supra* note 69, at 203.

83. *See* TERRY L. ANDERSON & DONALD R. LEAL, ENVIRO-CAPITALISTS: DOING GOOD WHILE DOING WELL 4-8 (1997).

84. U.S. CENSUS BUREAU, STATISTICAL ABSTRACT OF THE UNITED STATES 240 (1999).

85. *See* Robert H. Nelson, *Fires by Design*, WASH. POST, Aug. 9, 2000, at A25; *see also* ROBERT NELSON, A BURNING ISSUE: A CASE FOR ABOLISHING THE U.S. FOREST SERVICE (2000).

86. GAO, *National Park Service: Efforts to Identify and Manage the Maintenance Backlog*, GAO/RCED-98-143, May 1998, at 3.

87. *See* HOLLY LIPPKE FRETWELL, PUBLIC LANDS—FEDERAL ESTATE: IS BIGGER BETTER? 6 (2000).

88. *See id.* at 5.

Federal land mismanagement is instead the inevitable result of political control of environmental resources and the incentives such control creates. Even the most professional natural resource specialists employed by federal agencies are limited by the political nature of managing federally-owned lands. Private owners—whether corporations or non-profit land trusts—bear the costs of poor management decisions and have strong incentives to maintain their property. Yet as noted above, managers of federal lands face no such incentives.[89] Whereas private owners view maintenance expenditures and the like as investments in existing assets, government entities "treat all maintenance expenditures as current operating expenses that must be financed through current revenues."[90] The incentives faced by government agencies are simply not conducive to sound resource management.

Corporations large and small are subject to substantial fines. Executives and managers face jail time for environmental violations.[91] Federal officials, on the other hand, face no such risks. While federal facilities are generally supposed to meet the same environmental requirements, enforcement and compliance are spotty. One in four federal facilities were out of compliance with the applicable clean water standards in 1996, a higher rate than for equivalent facilities in the private sector.[92] Yellowstone National Park is supposed to be one of the crown jewels in the National Park System. Yet in 1998 and 1999 park officials allowed tens of thousands of gallons of raw sewage to flow untreated into local waterways.[93]

The comparison between private and political ecological performance is most stark when one considers the ecological legacy of the former Soviet nations. These nations were not without their environmental laws, but state control of the

89. *See* NELSON, *supra* note 46 (providing a more thorough critique of federal land management, and the failure of "scientific management" on federal lands); *see also* FRETWELL, *supra* note 87 (same).

90. Stroup & Goodman, *supra* note 78, at 439.

91. Even relatively minor environmental violations can land an individual in jail. *See, e.g.*, John D. Copeland, *The Criminalization of Environmental Law: The Implications for Agriculture*, 48 OKLA. L. REV. 237, 267-68 (1995) (recounting the prosecution and conviction of Bill Ellen and others for relatively minor wetland violations).

92. *See* David Armstrong, *The Nation's Dirty, Big Secret*, BOSTON GLOBE, Nov. 14, 1999, at A1 (reporting results of an EPA Inspector General investigation).

93. *See id.*

economy was also an ecological disaster. The fall of the Berlin Wall revealed toxic pollution far in excess of anything that had been imagined. Our worst ecological nightmares were the Soviet nations' environmental reality. In 1988 a single Ukranian city, Zaporozhe, released toxic emissions equivalent to approximately one-third of all American emissions at the time.[94] Potable drinking water was scarce and Soviet forests were decimated.[95] In just under thirty years, the Aral Sea was drained by 66 percent to subsidize irrigation, and fish populations were decimated.[96] The lack of private ownership left no one with any incentive to care about preserving ecological values.

Socialist systems are also worse for environmental protection because they sacrifice the natural ecological benefits of market-driven efficiency gains. In the simplest of terms, market competition creates tremendous pressure to minimize costs, and that means finding ways of doing more with less—producing more widgets with less material and energy. Over time, market economies produce a continued decline in the energy and material inputs necessary for a unit of industrial output. This can be seen in the replacement of copper with fiber optics (made from silica — i.e., sand), the downsizing of computer circuitry, the light weighting of packaging, the explosion of agricultural productivity, and so on.[97] Less material is used and disposed of, reducing overall environmental impacts from productive activity. This same trend is rarely evident in socialist economies where, on average, it took nearly three times as much energy to produce a given unit of goods or services.[98] Almost the same ratio existed

94. *See* PAUL CRAIG ROBERTS & KAREN LAFOLLETTE, MELTDOWN: INSIDE THE SOVIET ECONOMY 32 (1990).

95. *See id.* at 34-35.

96. *See* Richard L. Stroup & Jane S. Shaw, *Environmental Harms from Federal Government Policy, in* TAKING THE ENVIRONMENT SERIOUSLY, *supra* note 22, at 52. For more on the horrific Soviet environmental legacy, see MURRAY FESHBACH & ALFRED FRIENDLY, JR., ECOCIDE IN THE USSR: HEALTH AND NATION UNDER SIEGE (1991).

97. *See generally* Lynn Scarlett, *Doing More with Less: Dematerialization—Unsung Environmental Triumph, in* EARTH REPORT 2000: REVISTING THE TRUE STATE OF THE PLANET (Ronald Bailey ed., 1999); Indur M. Goklany, *Richer Is More Resilient: Dealing with Climate Change and More Urgent Environmental Problems, in* EARTH REPORT 2000: REVISTING THE TRUE STATE OF THE PLANET (Ronald Bailey ed., 1999).

98. *See* MIKHAIL BERNSTAM, THE WEALTH OF NATIONS AND THE ENVIRONMENT 24 (1991).

for steel.[99] The key to such improvements is a system of well-defined and enforced property rights. International studies of economic and environmental trends demonstrate that "environmental quality and economic growth rates are greater in regimes where property rights are well defined than in regimes where property rights are poorly defined."[100]

Indeed, the record of the past century should conclusively demonstrate that incorporating resources into the marketplace through the creation and protection of property rights is the surest means of replacing shortages with ample supply, and encouraging sustainable development.[101] As one looks around the world at which resources are protected and which are imperiled, a clear pattern emerges. Tropical forests, largely owned by governments or left as unowned commons, are in decline; temperate forests, predominantly in wealthy countries and often privately owned, are stable and expanding.[102] Fish stocks in the open oceans are declining, while aquaculture booms and fisheries with quasi-property rights in New Zealand and elsewhere maintain sustainable catches.[103]

Proven reserves of copper, iron, bauxite, and oil, among many other resources, have skyrocketed over the past several decades.[104] Prices for all these minerals—the surest measure of scarcity—have also declined. Indeed, the near-universal trend for natural resources managed primarily through market institutions is one of less scarcity and greater abundance.[105]

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99. *See id.*

100. Seth W. Norton, *Property Rights, the Environment and Economic Well-Being, in* WHO OWNS THE ENVIRONMENT? 37, 51 (Peter J. Hill & Roger E. Meiners eds., 1998); *see also* DON COURSEY & CHRISTOPHER HARTWELL, ENVIRONMENTAL AND PUBLIC HEALTH OUTCOMES: AN INTERNATIONAL AND HISTORICAL COMPARISON (Irving B. Harris Sch. Pub. Policy Studies, Working Paper No. 00.10, 2000), *abstract available at* http://www.harrisschool.uchicago.edu/wp/wp_00-10.html (finding that, across the board, greater government regulation of private activity correlates with higher levels of emissions and poorer public health indicators).

101. *See generally* Jerry Taylor, *The Challenge of Sustainable Development*, REG., Winter 1994, at 35.

102. *See* Sedjo, *supra* note 69, at 179.

103. *See* Michael De Alessi, *Fishing for Solutions: The State of the World's Fisheries, in* EARTH REPORT 2000: REVISTING THE TRUE STATE OF THE PLANET 86 (Ronald Bailey ed., 1999); Kent Jeffreys, *Rescuing the Oceans, in* TRUE STATE, *supra* note 69, at 295, 309.

104. *See* Taylor, *supra* note 101, at 37-38; *see also* Stephen Moore, *The Coming Age of Abundance, in* TRUE STATE, *supra* note 69, at 109, 115-16.

105. *See* Taylor *supra* note 101, at 37-38; *see also* Stephen Moore, *The Coming Age of Abundance, in* TRUE STATE *supra* note 69, at 109.

Much the same can be said of agriculture in nations where farmers own the land and reap the benefits of their own hard work and investment.[106] From 1961 to 1994, per capita food production increased nearly twenty percent and per capita agriculture production increased nearly as much.[107]

The environmental defense of the marketplace is not a defense of the status quo. Despite the dramatic gains of the past several decades, vast room for improvement remains. Environmental protection is an important societal goal, but it will not be achieved if existing policies and institutional arrangements are left in place. The ecological agenda of the next several years should focus on the creative extension of market institutions and the removal of government interventions that distort market transactions and obstruct the development of private solutions to environmental concerns.

IV. PRINCIPLES FOR REFORM

Reforming environmental policy will not be easy; policy revolutions are not made overnight. Adhering to a set of principles can guide reform efforts and avoid some of the pitfalls and cul-de-sacs that can derail promising policy changes. In the environmental context, these principles should seek to reduce government interventions that distort economic and environmental decisionmaking or subsidize environmental harm, promote technological development and wealth creation, develop and expand property rights in environmental resources, hold private actors accountable for the

106. This is not always true in the United States due to extensive farm subsidies that depress production. However, the United States's market economy is a tremendous driver of technological advance, which helps increase per-acre food yields.

107. *See* Paul Georgia et al., *Benchmarks: The Ecological and Economic Trends that Are Shaping the Natural Environment and Human Societies, in* EARTH REPORT 2000: REVISITING THE TRUE STATE OF THE PLANET 260-61, 256-57 (Ronald Bailey ed., 1999).

This has tremendous ecological benefits as increases in agricultural productivity reduce the stress that rising global population and food demand otherwise place on habitat and undeveloped lands. Had agricultural productivity not improved since the 1960s, producing the amount of food the world demands today would require nearly twice the amount of cropland. *See* Jonathan H. Adler, *Biosafe or Biosorry?*, 12 GEO. INT'L ENVTL L. REV. 761 (2000) (discussing importance of technological advance and increased agricultural production to biodiversity protection); Jonathan H. Adler, *More Sorry Than Safe: Assessing the Precautionary Principle and the Proposed International Biosafety Protocol*, 35 TX. INT'L L.J. 173, 198-202 (2000) (same).

environmental harms they cause, and foster ecological innovation by decentralizing decisionmaking. Not every principle will be applicable in every environmental policy context. Yet together they represent a new science of environmental protection that can lead to greater environmental progress in the years to come.

A. First, Do No Harm

Many government programs cause or encourage environmental harm. The federal government is far and away the nation's largest polluter. Nationwide there are approximately 50,000 sites contaminated by the federal government. Cleanup will cost an estimated $235-$389 billion, according to the General Accounting Office.[108] Merely cleaning up the lands used for military training and target practice will cost tens of billions of dollars.[109] In addition, numerous programs, including various subsidies for politically favored industries, encourage further environmental degradation. Subsidized disaster insurance and beach "restoration" programs reduce the cost of construction in flood plains and fragile coastal zones. Subsidized recreation on federal lands leads to overcrowding and ecological decline as sensitive lands, quite literally, are trampled underfoot.

Environmental problems that result from government programs are often themselves the rationale for expansive regulatory efforts. Thus, government subsidization of environmental harm costs Americans twice: first when they are taxed to pay for the programs, and again when they are taxed or regulated to address the problem that the government helped to create in the first place. Federally funded water projects and irrigation subsidies artificially lower water prices, producing fears of water shortages in years with low rainfall and calls for "efficiency" standards on showers, washing machines and toilets.[110] The Bureau of Reclamation and the U.S. Army Corps of Engineers dam and redirect rivers, disrupting

108. GAO, *Federal Facilities: Consistent Relevant Risk Evaluations Needed for Prioritizing Cleanups*, GAO/RCED-96-150, June 1996, at 29.

109. According to the Defense Science Board, cleaning five percent of such lands would cost an estimated $15 billion. *See* David Armstrong, *Government as Polluter: More Costly Cleanup on Horizon*, BOSTON GLOBE, Nov. 14, 1999, at A33.

110. *See* Ben Lieberman, *Potty Politics*, WASH. MONTHLY, Oct. 1998, at 30, 31.

watersheds, fragmenting habitat, and dislocating species,[111] and in the process fuel calls for greater wetland regulation and species recovery efforts.[112] By some estimates, "30 percent of the loss of forested wetlands in the lower Mississippi Valley resulted from private conversions encouraged by federal flood control projects."[113]

Some congressional leaders are proud of a new multi-billion-dollar plan to restore the Florida Everglades, but they should ask why such a massive restoration effort is required in the first place.[114] The Corps of Engineers began to remold the Florida Everglades in 1948 with disastrous results. Corps-built canals facilitated agricultural and residential development, increasing runoff and contamination. Species numbers and biodiversity dropped dramatically. Everglades destruction was fueled further by sugar subsidies that cost consumers an estimated $1.4 *billion* per year.[115] Now the Corps is proposing a $7.8 billion restoration project to undue some of the damage that federal policies brought.[116]

The single most effective step that the federal government could take to advance environmental protection is to adopt an environmental Hippocratic Oath to "first, do no harm" to the environment. By cleaning up its own act, the government could do much to reduce environmental harms. This not only means improving the compliance and performance records of government agencies and facilities, but also putting an end to government programs that encourage environmental degradation or wasteful use of resources. The federal budget should be scrubbed from top to bottom to eliminate programs that generate significant environmental impacts. Even

111. *See, e.g.*, Michael Grunwald, *Engineers of Power; Inside the Army Corps*, WASH. POST, Sept. 10, 2000, at A1 (discussing the environmental legacy of the U.S. Army Corps of Engineers).

112. It should be noted with some irony that the Corps is also the federal agency with primary responsibility for wetland regulation.

113. PAUL F. SCODARI, MEASURING THE BENEFITS OF FEDERAL WETLANDS PROGRAMS 16 (1997) (citing Robert N. Stavins & Adam B. Jaffe, *Unintended Impacts of Public Investments on Private Decisions: The Depletion of Forested Wetlands*, 80 AM. ECON. REV. 337, 349 (1990)).

114. *See* Michael Grunwald, *In Everglades, a Chance for Redemption*, WASH. POST, Sept. 14, 2000, at A1.

115. *See* GAO, *Sugar Program: Changing Domestic and International Conditions Require Program Changes*, GAO/RCED-93-84, April 1993.

116. *See* Grunwald, *supra* note 111.

programs that indirectly subsidize excess resource use by funding industrial research and development should be eliminated. The Energy Information Administration estimates that the government grants aggregate energy subsidies of between $5 billion and $10 billion per year, approximately $2 billion of which is devoted to research and development programs that benefit particular energy industries.[117] Greenhouse warming may or may not be a problem that requires urgent government attention, but it should be clear that there is little reason for the federal government to subsidize research and development of fossil fuels.

It is not only the federal budget that needs to be greened in this way. Existing tax and regulatory policies can also induce environmental damage. Consider the estate tax. This tax is levied upon transfers of wealth in any form at the time of death at a rate of up to 55 percent. This creates a powerful incentive for landowners to subdivide and develop their land, particularly in rural areas where landowners may be "land rich and cash poor." For them, subdividing or developing inherited land is the only way to pay the estate tax. The average annual household income for a tree farmer is under $50,000, according to the Joint Economic Committee.[118] Yet the average tree farm has a book value of $2 million or more.[119] When a tree farmer dies, there is simply no way for his family to pay the estate tax without clearing timber or selling off land. For this reason the estate tax has accelerated the cutting of timber on private land. "If estate taxes were not assessed by the government, thousands of acres of privately owned land would be protected from development," notes Dennis "Duke" Hammond, a biological scientist with the Florida Game and Fresh Water Fish Commission.[120]

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117. *See* Energy Info. Admin., *Federal Energy Subsidies: Direct and Indirect Interventions in Energy Markets*, at x, 6 (Nov. 1992). This study also notes that regulations do more to distort energy markets than subsidies at existing levels. *See id.* at x.

118. *See* JOINT ECON. COMM., 105TH CONG., THE ECONOMICS OF THE ESTATE TAX 50 (1998).

119. *See Reducing the Tax Burden: Hearing Before House Comm. on Ways and Means*, 105th Cong. 126 (1998) (statement of Douglas P. Stinson), *available at* http://waysandmeans.house.gov/fullcomm/105cong/1-28-98/1-28stin.htm.

120. Dennis E. Hammond, *Protecting Panther Habitat on Private Lands in Southern Florida—A Current Assessment*, *in* TRANS. 63D NORTH AMERICAN WILDLIFE AND NATURAL RESOURCES CONFERENCE 459 (1998).

Federal regulations, even environmental regulations, can cause environmental harm as well. Detailed rules that dictate how companies must meet particular projects leave little room for environmental innovation. "Regulations that are overly prescriptive can lock in existing technologies to the detriment of other technologies that might meet or exceed requirements," concluded the Office of Technology Assessment in a 1995 report.[121] The Environmental Law Institute reached similar conclusions in a recent study: "Technology-based emission limits and discharge standards, which are embedded in most of our pollution laws, play a key role in discouraging innovation."[122] At the same time, regulations that "grandfather" existing facilities can artificially prolong the lives of older, less efficient facilities, increasing pollution levels above what they would otherwise be.

In a similar fashion, hazardous waste regulations can increase the cost of handling items designated as "hazardous" so much that companies are forced to dispose of materials that could be profitably recycled or reused. While the EPA would like fluorescent bulbs to be recycled because of their mercury content, existing regulations push in the opposite direction. As the EPA itself acknowledged, "additional costs associated with managing, transporting, and disposing of lighting wastes as hazardous wastes can create an additional disincentive to join Green Lights [a voluntary federal energy-efficiency program] and make the initial investment in energy-efficient light technologies."[123]

Environmental regulations also have the potential to increase risks to human health and safety.[124] As Justice Breyer (then Judge Breyer) observed, "one can find many examples of regulators' ignoring one program's safety or environmental effects upon another."[125] Thus, when the EPA sought to ban the

121. U.S. OFFICE OF TECH. ASSESSMENT, INNOVATION AND COMMERCIALIZATION OF EMERGING TECHNOLOGIES 87-88 (1995).

122. *Id.* at 6.

123. 59 Fed. Reg. 38,290 (EPA 1994); *see also* Jonathan H. Adler, *Wasted Lights*, REG., Spring 1996, at 15-18 (citing regulatory disincentives for corporations to install more energy efficient lighting).

124. *See generally* Frank B. Cross, *Paradoxical Perils of the Precautionary Principle*, 53 WASH. & LEE L. REV. 851 (1996) (documenting the negative public health impacts that often result from environmental regulation).

125. STEPHEN BREYER, BREAKING THE VICIOUS CIRCLE: TOWARD EFFECTIVE RISK

use of asbestos in brake pads and applications, it ignored the fact that likely alternatives posed a greater risk to public health.[126] In promulgating tighter standards for ground-level ozone ("smog"), the EPA ignored data suggesting that reducing ground-level ozone could increase human exposure to ultraviolet-B radiation and consequently increase skin cancer rates.[127] Perhaps the most extreme examples of risky environmental regulation are federal fuel economy standards for automobiles. Designed to conserve energy, these regulations result in vehicle downsizing which reduces crashworthiness. The result, according to a Harvard-Brookings study, is several thousand additional highway fatalities per model year.[128]

In all of its activities, the federal government should adopt the environmental equivalent of the Hippocratic Oath and "first, do no harm." Before the government imposes mandates or restrictions on the private sector, it should make sure its own house is in order and eliminate environmentally-destructive programs.[129] In a similar vein, environmental policies aimed at reducing risks must not increase other risks in the process.

B. Green Through Growth

Economic progress is absolutely essential to environmental progress. Environmental protection is a good, and like all goods it must be purchased. A healthy economy is necessary to finance environmental improvements. While many environmental activists perceive a conflict between economic growth and environmental progress, the opposite is true.

REGULATION 22 (1993); *see also* Edward W. Warren & Gary E. Marchant, *"More Good Than Harm": A First Principle for Environmental Agencies and Reviewing Courts*, 20 ECOLOGY L.Q. 379, 390 (1993) (noting that "when agencies regulate a particular substance or technology, they often fail to consider the secondary impacts of regulation, such as the risks presented by substitute products or activities").

126. *See* Corrosion Proof Fittings v. EPA, 947 F.2d 1201 (5th Cir. 1991).

127. *See* Am. Trucking Ass'ns, Inc. v. EPA, 175 F.3d 1027, 1051 (D.C. Cir. 1999), *aff'd in part, rev'd in part*, Whitman v. Am. Trucking Ass'ns, 121 S. Ct. 903 (2001). The Court of Appeals for the D.C. Circuit held that the EPA's refusal to consider the radiation-blocking potential of tropospheric ozone violated the CAA. *See id.* at 1051-53. The Supreme Court did not address that issue on review.

128. *See* Robert W. Crandall & John D. Graham, *The Effect of Fuel Economy Standards on Automobile Safety*, 32 J.L. & ECON. 97, 110 (1989).

129. It should be noted that the National Environmental Policy Act does relatively little in this regard, as it only requires the government to examine and report the likely environmental impacts of federal projects. It has no substantive requirement that such impacts be reduced.

Sewage treatment facilities and other environmental improvements are not free. Moreover, a significant body of literature has found a correlation between economic improvements and several measures of environmental quality. Not only are wealthy communities healthier than poor communities, but they also tend on average to be more concerned about upholding environmental values as well.[130]

Wealthier societies have both the means and the desire to address a wider array of environmental concerns.[131] Economic growth fuels technological advance and generates the resources necessary to deploy new methods of meeting human needs efficiently and effectively. Thus, wealthier societies tend to provide for human needs in a more environmentally sound manner. "Countries undergo an environmental transition as they become wealthier and reach a point at which they start getting cleaner."[132] This occurs first with particularly acute environmental concerns, such as access to safe drinking water and sanitation services. As affluence increases, so does the attention paid to conventional pollution concerns such as fecal coliform bacteria and urban air quality.[133]

In much the same way that wealthier societies become cleaner, "wealthier is healthier."[134] In other words, as income increases, mortality and morbidity decline.[135] Conversely, "when national income falls, there often is a significant increase

130. *See generally* RONALD INGLEHART, CULTURE SHIFT IN ADVANCED INDUSTRIAL SOCIETY (1990) (noting that societies become increasingly preoccupied with quality of life issues, such as environmental protection, as they become more affluent).

131. *See* Norton, *supra* note 100, at 45 (noting that, insofar as environmental quality is viewed as a "good," "consumption" of environmental quality will increase as wealth increases).

132. Indur Goklany, *Richer Is Cleaner*, *in* TRUE STATE, *supra* note 69, at 339, 341.

133. Goklany observes that while the "environmental transition" for drinking water and sanitation occurs "almost immediately as the level of affluence increases above subsistence," the transition appears to occur at approximately $1,375 per capita for fecal coliform and $3,280 and $3,670 per capita for urban particulate matter and sulfur dioxide concentrations respectively. *Id.* at 342. For a fuller treatment of the correlation between affluence and air quality, see generally GOKLANY, *supra* note 24.

134. *See* Aaron Wildavsky, *Wealthier Is Healthier*, REG., Jan.-Feb. 1980, at 10. For a more complete discussion of this phenomenon, see AARON WILDAVSKY, SEARCHING FOR SAFETY (1988).

135. *See, e.g.*, Susan L. Ettner, *New Evidence on the Relationship Between Income and Health*, 15 J. HEALTH ECON., 67 (1996); John D. Graham, Bei-Hung Chang & John S. Evans, *Poorer Is Riskier*, 12 RISK ANALYSIS 333, 336 (1992).

in mortality and a decline in health status."[136] Expenditures on regulatory compliance are rarely wealth enhancing, and therefore increasing regulatory costs can reduce gains in public health.[137] As Justice Stephen Breyer observed, "[a]t all times regulation imposes costs that mean less real income available to individuals for alternative expenditure[, which] itself has adverse health effects."[138]

Wealthier societies are not only cleaner and healthier; they are also more willing and able to devote resources to environmental concerns. Public support for environmental measures, both public and private, correlates with changes in personal income.[139] In economic jargon, "[w]illingness to pay for environmental measures . . . is highly elastic with respect to income."[140] Thus, it should be no surprise that donors to environmental groups tend to have above average annual incomes. Members of the Sierra Club, for example, have an average household income *more than double* the U.S. average.[141]

In the aggregate, environmental regulation can work against continuing environmental progress by diverting tens of billions of dollars, if not more, away from wealth-creating activity. Insofar as regulation reduces economic growth by diverting investment and human energies away from productivity, it will retard environmental progress. While this is true in the U.S., it

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136. *Is the Office of Management and Budget Interfering with Workers Health and Safety Protection?: Hearing Before the Senate Comm. on Gov't Affairs*, 102d Cong. 43 (1992) (statement of James B. MacRae, Jr., Acting Administrator and Deputy Administrator, Office of Information and Regulatory Affairs, Office of Management and Budget). MacRae cited several studies, including a 1984 report by Congress's Joint Economic Committee that found that declines in real per capita income in the early 1970s led to a corresponding increase in total mortality, amounting to as many as 60,000 additional deaths. *See id.* at 45 (citing JOINT ECON. COMM., 98TH CONG., ESTIMATING THE EFFECTS OF ECONOMIC CHANGE ON NATIONAL HEALTH AND SOCIAL WELL-BEING, J842-38 (1984)).

137. *See generally* Frank B. Cross, *When Environmental Regulations Kill: The Role of Health/Health Analysis*, 22 ECOLOGY L.Q. 729 (1995); Ralph L. Keeney, *Mortality Risks Induced by Economic Expenditures*, 10 RISK ANALYSIS 147 (1990).

138. BREYER, *supra* note 125, at 23.

139. This is also generally true for charity in general. *See* RICHARD B. MCKENZIE, WHAT WENT RIGHT IN THE 1980S, at 70 (1994) (noting that "[h]igher incomes lead to increased giving").

140. Richard L. Stroup & Roger E. Meiners, *Introducton: The Toxic Liability Problem: Why Is It Too Large?*, *in* CUTTING GREEN TAPE: TOXIC POLLUTANTS, ENVIRONMENTAL REGULATION AND THE LAW 15 (Richard L. Stroup & Roger E. Meiners eds., 2000).

141. *See id.* (citing 1992 reader survey for *Sierra* magazine).

is especially true in the poorest of nations.[142] Therefore, environmental policy makers must always be conscious of the costs of environmental measures, as increased compliance costs can come at the expense of environmental improvement.

C. Promote and Protect Private Property

America has a proud conservation tradition demonstrating that private owners serving as land and resource managers, whether individuals, corporations, or environmental groups, are superior to political entities. Rather than expanding government ownership and regulation of threatened ecological resources, policy makers should seek creative ways of expanding property-based institutions into the ecological realm.

As noted above, the creation of property interests empowers owners to act as stewards of environmental resources and facilitates conservation efforts in the private sector. Whereas public or politically managed lands often suffer, "private owners have the ability to protect their lands from over use [sic]."[143] The security of property rights encourages owners to pursue the enhancement of their own subjective value preferences, including both commercial and non-commercial values. Property rights enable timber companies to protect their investment in planting trees or enhancing forest growth, but they also protect the investments made by conservation groups in ecological protection and restoration. "Private ownership includes not only hunting preserves, commercial bird breeders, parrot jungles, and safari parks, it also includes wildlife sanctuaries, Audubon Society refuges, World Wildlife Fund preserves, and a multitude of private, non-profit conservation and preservation projects."[144] These organizations raise money by soliciting contributions to acquire ownership in preferred lands.

Whereas political conservation often generates a zero-sum

142. Goklany, *supra* note 132, at 370 ("[A]nything that unduly retards economic growth in developing countries—including inefficient policies, no matter how well intentioned—will ultimately retard net environmental progress and imperil human lives.").

143. Council on Environmental Quality, *Special Report: The Public Benefits of Private Conservation, in* ENVIRONMENTAL QUALITY 1984, at 363, 367 (1984).

144. Smith, *supra* note 68, at 456.

game in which only the most popular initiatives receive funding, private property empowers forward-looking conservationists to pursue unpopular ecological causes. At the turn of the last century, groups such as the National Audubon Society were able to use private property to protect threatened species habitat at a time when there was no political support for government action.[145] Similarly, at a time when governments and private organizations encouraged the slaughter of raptors, one woman, Ms. Rosalie Edge, was able to purchase Hawk Mountain to protect birds of prey from extirpation. While unpopular at the time, Ms. Edge's purchase created one of the most important raptor research sites in the world.[146] In a similar fashion, a handful of individuals saved the bison from extinction on the western plains at a time when the federal government was subsidizing its slaughter.[147] Were it not for these efforts, it is unlikely that there would be any buffalo in Yellowstone National Park today.

Property rights need not be individuated to serve environmental goals. Collective entities, from conservation groups to condominium associations, play an important role in conservation. Additionally, the recognition of conservation easements already empowers conservation groups to purchase development rights from a given parcel of land and protect the present ecological values.[148] There is no single property arrangement that is appropriate for every resource, but this does not mean that the institution of property ownership can be disregarded in conservation efforts.

Time and again, the greatest conservation successes occur when environmental resources are rescued from the tragedy of the commons through the creation of property rights. In British Columbia, for example, the halibut fishery was saved from ruin by the introduction of private fishing rights. This change not

145. *See* JONATHAN H. ADLER, ENVIRONMENTALISM AT THE CROSSROADS 2-3 (1995).

146. *See* Robert J. Smith, *Private Conservation Case Studies: Hawk Mountain Sanctuary Association* (Apr. 1, 1999), *available at* http://www.cei.org; *see also* Council on Environmental Quality, *supra* note 143, at 387-94.

147. *See* Ike C. Sugg, *Where the Buffalo Roam, and Why*, EXOTIC WILDLIFE, Jan/Feb. 1999 ("Bison were initially saved by six individuals who either saw business oppprtunities in the existence of bison or simply wanted to save a vanishing species." (quoting Dr. Valerius Geist)).

148. *See* STEPHEN EAGLE, CONSERVATION EASEMENTS AND PRIVATE LAND STEWARDSHIP (1997) (discussing the use of conservation easements).

only led to sustainable catch levels but also increased the quality of the fish caught and the profitability of local fishing operations.[149] The creation of private property rights advanced conservation where regulation failed. Iceland and New Zealand experienced similar success with the implementation of a property-regime known as individual transferable quotas.[150] In a similar fashion, allowing the commercial utilization and quasi-ownership of elephants in Zimbabwe has led to larger herds and the devotion of greater acreage to wildlife habitat.[151] This not only benefits elephants, but also other, less-marketable species which require similar habitat.

In some cases, private property rights exist, but they are too narrow to allow for private conservation efforts. For decades, many western states only recognized property rights in water that was used for irrigation, drinking, or another productive use. Leaving instream water flows to enhance fish habitat was not deemed a productive use and could not be advanced through private market transactions. Over time, however, states such as Oregon have begun to recognize property rights in instream flows to varying degrees.[152] Today, local environmental groups such as the Oregon Water Trust purchase instream flows from farmers to improve salmon habitat.[153] This approach can be more cost-effective, and certainly less contentious, than pushing to tighten regulatory restrictions on water use. This institutional change has facilitated greater conservation by expanding the definition of property rights to encompass environmental values.

Dr. Robert Nelson, who served in the Interior Department for nearly two decades, has a similar proposal for the

149. *See* R. Quentin Grafton et al., *Private Property and Economic Efficiency: A Study of a Common-Pool Resource*, 43 J.L. & ECON. 679 (2000).

150. The Icelandic experience is chronicled in HANNES H. GISSURARSON, OVERFISHING: THE ICELANDIC SOLUTION (IEA Studies Env't No. 17, 2000); *See also* DE ALESSI, *supra* note 64, at 41-43.

151. IKE SUGG AND URS KREUTER, ELEPHANTS AND IVORY: LESSONS FROM THE TRADE BAN 16, 51-53 (IEA Environment Unit 1994); *see also* Randy T. Simmons & Urs P. Kreuter, *Herd Mentality*, 50 POL'Y REV. 46 (1989).

152. *See* TERRY L. ANDERSON & PAMELA SNYDER, WATER MARKETS: PRIMING THE INVISIBLE PUMP 111-32 (1997).

153. *See* ANDERSON & LEAL, *supra* note 83, at 94-95. For an in-depth discussion of the Oregon Water Trust, see Erin Schiller, Private Conservation Case Studies: The Oregon Water Trust (Nov. 1, 1998), *available at* http://www.cei.org/CPCCase.asp.

protection of grazing lands.[154] Under current law, federal land grazing permits purchased by ranchers may only be used for grazing cattle. Additional rules, such as base-property ownership requirements, further restrict the marketability of grazing permits. As a result, environmental groups that believe it is necessary to reduce grazing on federal lands to protect habitat or conserve rangeland have little choice but to seek tighter regulations or the revocation of permits. Nelson's proposal is to transform the grazing permits into forage-access rights. Rather than leasing permits to graze cattle, the federal government would instead lease or sell fully transferable forage-access rights that could be used for grazing cattle or for other uses, from recreation to conservation. Thus, a private environmental organization could purchase forage-access rights from the government or existing owners and opt to graze elk, sponsor recreational use of the land in question, or simply retire the permits and do nothing at all. Again, conservation can be advanced by moving toward more complete property rights in environmental resources.

D. Make the Polluter Pay

Making the polluter pay is merely an extension of the principle that environmental protection should be focused on the protection of property rights. Pollution control, at its heart, is about preventing the forcible imposition of a waste or emission by one person onto another. Therefore, pollution control efforts should focus upon instances where an unwanted emission causes actual harm and not on whether a company complies with a permit or generates the "right" amount of waste. Pollution control efforts should thus be seen as an extension and complement to traditional nuisance doctrines and their effort to keep pigs out of parlors, so to speak.[155]

While the rhetoric of "polluter pays" is often bandied about in environmental policy discussions, few environmental programs embody this principle. Even enforcement efforts that target polluters rarely impose fines or penalties in proportion

154. *See* Robert H. Nelson, *How To Reform Grazing Policy: Creating Forage Rights on Federal Rangelands*, 8 FORDHAM ENVTL. L.J. 645 (1997) (outlining the proposal).

155. *See* Euclid v. Ambler Realty Co., 272 U.S. 365, 388 (1926) (noting a "nuisance may be merely a right thing in the wrong place, like a pig in the parlor instead of the barnyard").

to the actual amount of pollution caused.[156] Current environmental policy too rarely focuses on harm and too often focuses on compliance with byzantine rules and requirements.[157] Fines are levied not when the property of another is contaminated, but when a permit is improperly filed or a waste-transport manifest is not completed in line with the demands of regulatory officials.[158] This is astonishing evidence that many pollution-control efforts are misdirected. The proper focus of government officials should be identifying and prosecuting firms that tangibly threaten human health and environmental properties rather than monitoring compliance with overly complex and time-consuming permit and paperwork requirements.

Polluters certainly should be held responsible. This requires the application of traditional tort law principles, not the erection of a sprawling bureaucracy. Liability should be based upon the intrusion of one party into the property of another, not on the violation of a bureaucratic proscription on how to transport a substance or submit paperwork. Restitution should be paid to those harmed, not simply to a government agency that proclaims it will spend the money in the public interest. Unfortunately, the ability of private parties to restrain upstream polluters is limited in the United States today. In some cases, traditional common law approaches have been completely preempted by federal environmental laws.[159] An important environmental reform would be to end this form of preemption while, at the same time, requiring a demonstration of harm in the prosecution of environmental violators. This is particularly important in the context of citizen suits, through which private individuals and groups enforce existing environmental laws. Without a substantive harm requirement and clear property interests in underlying resources, there is

156. *See* Adler, *supra* note 51, at 40-48.

157. Indeed, in a recent survey of corporate counsels, only 30 percent believed it was even *possible* for their firms to achieve full compliance with applicable state and federal environmental requirements. *See* Marianne Lavelle, *Environmental Vise: Law, Compliance*, NAT'L L.J., August 30, 1993, at S1.

158. For instance, under the Clean Water Act, firms that violate permit conditions can be fined up to $25,000 per violation, per day. 33 U.S.C. § 1319(d) (2000). No demonstration of measurable environmental harm is necessary for such fines. *See* Friends of the Earth v. Laidlaw Envtl. Servs., 528 U.S. 167 (2000).

159. *See* Illinois v. Milwaukee, 731 F.2d 403 (7th Cir. 1984); Conner v. Aerovox, Inc., 730 F.2d 835 (1st Cir. 1984).

likely to be excessive enforcement of environmental standards that do little if anything to improve environmental quality.[160]

Broad technology mandates or permit schemes operate as ecological drift nets. Such approaches achieve pollution reductions more through their scope than their efficiency, and as a result, they tend to produce environmental improvements at the expense of innocent individuals who have not contributed to the harm. Even when the impacts of water or airborne emissions are extremely difficult to control, environmental protection and simple justice are better served when pollution reduction efforts focus on the true sources of pollution and ensure that it is the polluters who pay for the damage.

Consider the case of air pollution. It is well-established that a small fraction of automobiles are responsible for the vast preponderance of auto-related emissions. Indeed, half of the emissions in California are generated by only ten percent of the cars on the road.[161] This means that for every ten cars, the dirtiest one pollutes as much as the other nine. Nonetheless, federal officials insist upon imposing significant costs on the owners of all cars through "clean fuel" requirements, periodic emissions inspections, and similar regulations in order to meet federal air quality standards. If emission reductions are necessary in some regions to protect human health (a debatable proposition), targeting the dirtiest portion of the automobile fleet will reduce pollution more efficiently and more equitably. The majority of car owners whose vehicles are in clean-running condition should not be forced to pay for the pollution caused by an irresponsible minority. (Additionally, it is questionable whether the federal government should tell local communities what level of air emissions is acceptable.)

Making the polluter pay should not entail trying to eliminate the generation of wastes and byproducts of a modern, industrial society, nor does it mean regulating every emission, every industrial process, indeed every aspect of economic life. Making the polluter pay means focusing environmental

160. *See generally* Adler, *supra* note 75 (setting out argument more fully).

161. *See* DONALD STEDMAN ET AL., ON-ROAD REMOTE SENSING OF CO AND HC EMISSIONS IN CALIFORNIA 13 (Cal. Air Res. Bd. 1994); J.G. Calvert et al., *Achieving Acceptable Air Quality: Some Reflections on Controlling Vehicle Emission*, SCI., July 2, 1993, at 40.

protection efforts on the greatest sources of harm and ensuring that polluters pay for the costs of the harms they inflict upon others.

E. Decentralize Decisionmaking

Although not every environmental problem will be solved by removing government subsidies and not every environmental concern is immediately amenable to the creation of property rights, these are not excuses for maintaining the status quo. Few if any environmental problems are national in scope. Most are local or regional in nature. Therefore, few environmental concerns require a national solution. Most environmental concerns would be best handled at the level at which the problem occurs. Wherever possible, policymakers should decentralize environmental decisionmaking by returning more power and authority to state and local governments. Where problems have the potential to generate substantial interstate externalities, the federal government should support the development of interstate compacts and regional approaches rather than assuming federal regulations are the best solution.[162]

Even though most environmental problems are local or regional, the federal government dominates most environmental protection efforts.[163] Hazardous waste sites impact local communities. Water quality is typically a local or regional concern. Even the impact of urban air pollution is often confined to a given airshed.[164] At the same time, state and local governments are showing themselves willing and able to address many environmental concerns. "The popular desire for a clean environment can be realized with far more common sense by returning control of local environmental issues to state

162. Where such solutions are impracticable, reliance on a "golden rule" for resolving interstate externality problems seems advisable. Such an approach is outlined in Thomas W. Merrill, *Golden Rules for Transboundary Pollution*, 44 DUKE L.J. 931 (1997).

163. Indeed, this has been the source of substantial tension between the federal and state governments. *See* John P. Dwyer, *The Practice of Federalism Under the Clean Air Act*, 54 MD. L. REV. 1183, 1185 (1995) ("So much political power has been reallocated to the federal government that, at times, the states could be mistaken for vassals of the federal government.").

164. *See* Merrill, *supra* note 162, at 976-78 (noting reasons why "as a general matter, transboundary pollution does not present an especially serious form of harm relative to other types of multijurisdictional environmental phenomena").

and local government," according to David Schoenbrod, an attorney formerly with the Natural Resources Defense Council.[165]

Twenty years ago, Richard Stewart noted the "sobering fact is that environmental quality involves too many intricate, geographically variegated physical and institutional interrelations to be dictated from Washington."[166] This is even more true today as environmental policy is increasingly focused on smaller, more complex problems that are tied to local conditions. Federalization of environmental law inevitably results in "one-size-fits-nobody" regulations. "Federal regulators never have been and never will be able to acquire and assimilate the enormous amount of information necessary to make optimal regulatory judgments that reflect the technical requirements of particular locations and pollution sources."[167]

Environmental concerns and potential solutions are not the same throughout the United States. To succeed in a given locale, environmental policies must be tailored to local conditions. State and local officials are apt to have local expertise that is, in practice, unobtainable by national agencies.[168] "The knowledge necessary to administer any air pollution control program . . . can be found only at the local level."[169] The relative sources and composition of urban air pollution varies from place to place. The nature of air pollution concerns in Phoenix, Arizona, differs from that in Atlanta, Georgia.[170] Much the same can be said for most pollution control issues.[171]

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165. David Schoenbrod, *Time for the Federal Aristocracy to Give Up Power, in* POLICY STUDY NO. 144, at 2 (Center for the Study of American Business 1998).

166. Richard B. Stewart, *Pyramids of Sacrifice?: Problems of Federalism in Mandating State Implementation of National Environmental Policy*, 86 YALE L.J. 1196, 1266 (1977).

167. HENRY N. BUTLER & JONATHAN R. MACEY, USING FEDERALISM TO IMPROVE ENVIRONMENTAL POLICY 27 (American Enterprise Institute 1996).

168. This is essentially Hayek's argument about the impossibility of centralizing information. *See* F.A. Hayek, *The Use of Knowledge in Society*, 35 AM. ECON. REV. 1 (1945). Of course, Hayek might be skeptical about the ability to centralize information at the state level as well. Nonetheless, Hayek supported federalist systems. *See* F.A. HAYEK, INDIVIDUALISM AND ECONOMIC ORDER 255-72 (1996).

169. Dwyer, *supra* note 163, at 1218.

170. *See* NAT'L RESEARCH COUNCIL, RETHINKING THE OZONE PROBLEM IN URBAN AND REGIONAL AIR POLLUTION 351 (1991).

171. For example, soil composition and hydrology will affect the likelihood of

When policies are nationalized, on the other hand, it can become difficult to address the concerns of those communities that suffer disproportionately from policy errors or omissions. Local environmental concerns must compete against national political priorities. A small town that needs to devote resources to improving the quality of its drinking water must compete for federal funds and attention with whatever environmental concern is on the evening news.[172] Federal agencies and national politicians are less responsive to local needs than more local institutions and officials. As former Illinois EPA chief Mary Gade explains, "States are closest to their constituents and problems, bringing a necessary sensitivity and perspective to local environmental issues that even EPA's 10 regional offices, often many hundreds of miles away, can't have."[173]

Allowing local or regional control over regulation of environmental problems can promote healthy interjurisdictional competition for the best environmental policies.[174] Allowing the states to operate as green "laboratories of democracy"[175] can produce both economic and environmental gains. Both the theoretical and empirical evidence demonstrate that "the possibility of competition will lead inexorably to experimentation and product differentiation," and this, in turn, produces "innovation and improvement."[176]

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groundwater contamination from runoff or waste disposal; population density and topography will affect the likely public health impact of industrial accidents; weather patterns, such as the frequency of inversions, will affect ambient concentrations of air pollutants; and so on.

172. *See* Keith Schneider, *How a Rebellion over Environmental Rules Grew from a Patch of Weeds*, N.Y. TIMES, Mar. 24, 1993, at A16 (quoting observation of Columbus, Ohio health official that "the new rules coming out of Washington are taking money from decent programs and making me waste them on less important problems").

173. Mary Gade, *When the States Come Marching In*, 10 NAT. RESOURCES & ENV'T, Winter 1996, at 4.

174. *See generally* Adler, *supra* note 25, at 625-32; Jonathan H. Adler, *A New Environmental Federalism*, *in* FORUM FOR APPLIED RESEARCH AND PUBLIC POLICY (1998); David L. Markell, *States As Innovators: It's Time for a New Look at Our "Laboratories of Democracy" in the Effort To Improve Our Approach to Environmental Regulation*, 58 ALB. L. REV. 347 (1994); ALEXANDER VOLOKH ET AL., RACE TO THE TOP: THE INNOVATIVE FACE OF STATE ENVIRONMENTAL MANAGEMENT (Reason Pub. Policy Inst., Policy Study No. 239, 1998).

175. New State Ice Co. v. Liebmann, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting).

176. Steven G. Calabresi, *"A Government of Limited and Enumerated Powers": In Defense of* United States v. Lopez, 94 MICH. L. REV. 752, 777 (1995).

Forty states have their own hazardous waste cleanup program, many of which put the federal Superfund program to shame by spending substantially less money than the federal government.[177] It typically costs $25-30 million to clean up a single site in the federal Superfund program, and the average cleanup time is about ten years. By comparison, Minnesota is cleaning up sites for less than $5 million each and completing cleanups in only a few years.[178] Brownfield redevelopment programs are talked about in Washington, D.C., but they are actually happening at the state level.[179] Concerned that environmental enforcement efforts are inordinately focused on measures of "inputs," rather than tangible environmental results, two dozen states have passed environmental audit privilege laws since 1993.[180] These laws reduce penalties for companies that voluntarily disclose and correct environmental violations, leading to the greater disclosure and cleanup of pollution problems. New Jersey may have more costly regulations than most states, but it was also the first state to statutorily authorize multimedia environmental permits.[181] This approach to permits increases the operational flexibility afforded to regulated firms, and it consolidates reporting and paperwork requirements while facilitating more accurate emission inventories and reducing cross-media transfers of pollutants.[182]

The benefits of greater state and local control over environmental decisionmaking can be seen in the land management context as well. State wetland protection efforts preceded federal regulation by over a decade, and state programs are regularly developing new means of conserving and restoring wetlands while the federal program remains mired in controversy.[183] National forests lose money on timber

177. *See* J. WINSTON PORTER, CLEANING UP SUPERFUND: THE CASE FOR STATE ENVIRONMENTAL LEADERSHIP 5 (Reason Pub. Policy Inst., Policy Study No. 195, 1995).

178. *See id.*

179. *See generally* GATTUSO, *supra* note 6.

180. *See* Adler, *supra* note 51, at 45.

181. *See* Jeanne Herb, *Success and the Single Permit*, ENVTL. FORUM, Nov./Dec. 1997, at 17.

182. *See id.* at 18.

183. *See* Jonathan H. Adler, *Wetlands, Waterfowl, and the Menace of Mr. Wilson: Commerce Clause Jurisprudence and the Limits of Federal Wetland Regulation*, 29 ENVTL. L. 1, 47-54 (1999) (discussing the history and performance of state wetland

sales and have a poor record of environmental protection; state forests, such as those in Montana, turn a profit from timber management *and* have superior environmental performance.[184] States such as Texas and New Hampshire have taken steps to make their parks self-sufficient while improving the services offered to local residents.[185]

This is not to say that no state will ever enact bad environmental policy. States do and will continue to adopt short-sighted policies in the environmental arena as in every other area of public policy. It is also possible for states to overregulate environmental matters.[186] The question should be whether the decentralization of environmental policy-making, viewed in the aggregate, is likely to improve environmental protection. Given the stagnation of environmental reform efforts at the federal level and the tremendous burst of environmental innovation in many states, encouraging environmental devolution is anything but anti-environmental. Experimentation is necessary to develop the next generation of environmental measures, and it will be more productive to have fifty sets of experiments than to rely on only one.

V. CONCLUSION

The case for comprehensive environmental reform is clear. Current environmental laws frustrate the development of cleaner technologies, penalize landowners for owning habitat, and fail to address the most significant environmental risks. Those institutions upon which free and prosperous societies are built—private property, voluntary exchange, freedom of contract, and the rule of law—will better provide for the protection of public health and ecological values. Such approaches may not be perfect, but they hold more promise than conventional strategies for environmental protection. It is important to give them that chance.

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regulation).

184. *See* DONALD LEAL, TURNING A PROFIT ON PUBLIC FORESTS (Political Econ. Research Ctr., Policy Series PS-4, 1995).

185. *See* DONALD LEAL & HOLLY LIPPKE FRETWELL, BACK TO THE FUTURE TO SAVE OUR PARKS (Political Econ. Resesarch Ctr., Policy Series PS-10, 1997).

186. *See* Richard L. Revesz, *Rehabilitating Interstate Competition: Rethinking the "Race-to-the-Bottom" Rationale for Federal Environmental Regulation*, 67 N.Y.U. L. REV. 1210, 1241-42 (1992).