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RETHINKING ENVIRONMENTAL CONTROLS: MANAGEMENT STRATEGIES FOR COMMON RESOURCES

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How can we make sense of environmental law? Our legislators churn out great undigestible masses of statutes about the environment, which in turn are interpreted by mounds of regulations, all densely packed with bizarre terms and opaque acronyms.[1] One way to simplify this forbidding regulatory mass is to envision our environmental controls as exemplars or paradigms of a few generic strategies for managing resources. Through the use of these paradigms we can compare and critically analyze the strategies they represent.

The first issue in such an enterprise concerns the characteristics that make resources "environmental," so that they require some distinctive management. The conventional answer is that environmental resources present variants on "commons" problems, and in the first two Parts of this paper I explore that view. In Part III, I set out models of four generic strategies that may be used to manage "commons" resources.

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1. One of my favorites is EPCRTKA, for the Emergency Planning and Community Right-To-Know Act, 42 U.S.C. §§ 11001-11050 (1988), also somewhat less forbiddingly known as Title III of SARA, the initials for the Superfund Amendments and Reauthorization Act of 1986, Pub. L. No. 99-499, 100 Stat. 1729.

In Part IV, I focus on the cost components of management, in order to approach the all-important question about which is the "best" or least-cost strategy: This is the question I take up in Part V. The Part identifies an evolutionary relationship among the four strategies and argues that none of these strategies is an absolute "best" or least-cost approach: The choice of the best strategy depends on the level of demand for or pressure on the particular environmental resource. At low levels of pressure, one strategy might be the least costly, whereas at higher levels, a different strategy is better.

Part VI uses air pollution control as an example to illustrate the progression of strategies, and it also illustrates the current and very heated controversies about which strategy is best. These controversies indirectly raise some questions about one management strategy—norm-creation or what we might call moral suasion or exhortation—that much of the modern environmental regulatory discussion tends to underrate or marginalize.

In Part VII of the Article, I consider the norm-creation strategy. It is especially important to examine this strategy because although moral and ethical issues are certainly under discussion in environmental law, they tend to be set up in opposition to the supposedly more hard-nosed management approaches.[2] This opposition ignores the role of normative messages in resource management. Because different management techniques may carry different normative messages, and because those different messages in turn help to create a culture that itself has some effect on the way people use environmental resources, a stark opposition between norm-creation and other more technical approaches is a mistake. My more general point is that if culture does have an effect on behavior, then we ought to pay attention to the culture that is created by our choices when we choose one management strategy over another.

I. THE ENVIRONMENT AS A COMMONS PROBLEM

In everyday parlance, the "environment" denotes the indefinite surroundings—the set of things or circumstances that are "just there" as a general ambiance or a given. In this sense, for example, we may talk of an "intellectual environment" or a "business environment." In our current ordinary language, though, the unmodified "environment" generally refers to an amorphous set of physical surroundings, including the air and waters and wildlife. But insofar as an "environment" remains a

2. *See* M. SAGOFF, THE ECONOMY OF THE EARTH 35-39 (1988) (contrasting economic considerations to ethical values); *cf.* W. BAXTER, PEOPLE OR PENGUINS: THE CASE FOR OPTIMAL POLLUTION 7-8 (1974) (rejecting idea that ethics and economics call for different environmental programs).

given, we think the word denotes something that in large measure is simply out of our control.

Economists approach this subject from a different angle, but their account reveals why we might feel that the "environment" is beyond our control. According to the economists, the environment belongs to the realm of the "commons," the things that don't belong to anybody in particular.[3] Because environmental goods don't belong to anybody in particular, people tend to treat these goods as if they belonged to everyone, and individuals feel free to use and dispose of these goods however they choose. The result, according to this account, is the familiar "tragedy of the commons"—environmental goods are exhausted, wasted, and seldom if ever replenished by their users.[4]

Fishing areas—open to anyone who wants to fish—provide the classic example.[5] In such an area, the fishers may find to their distress that the fish become depleted due to overfishing. Why does everyone overfish, even to the detriment of the body of water and its living stocks? According to the economic account, everyone does so because each user knows that, even if any particular individual refrains from fishing so intensely, everyone else will continue to fish, and in fact the others might just fish a little bit more, to take up the slack left by any moderate fisher.[6] The moderate fisher, in short, would just be a sucker; she would lose out while all her rivals would take what she gave up. For a similar reason, the fisherfolk do not restock the area: Any individual restocker would find that most of the new fish would go to other fishers, who have just been sitting around doing nothing and who now can take a "free ride" on the restocker's investment and work. For anyone aside from the most stubborn conservationist, this prospect lessens any individual's incentive to take the effort to restock.[7]

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3. *See, e.g.*, W. OPHULS, ECOLOGY AND THE POLITICS OF SCARCITY 147 (1977).

4. *See id.* For the original use of the "tragedy," see Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243 (1968). In recent years there has been considerable criticism of the "commons" terminology, on the ground that this usage confounds "common property," which is available only to a set of joint owners, with "open-access" or "public" resources, which are available to the public at large. *See, e.g.*, Cox, *No Tragedy of the Commons*, 7 ENVTL. ETHICS 49 (1985). Except where noted, this Article will continue the now-established usage of "commons" as open-access resource, but the terminological limitations are duly noted.

5. The idea of the tragedy of the commons may have had its beginnings with the study of fishing. *See* Gordon, *The Economic Theory of a Common-Property Resource: The Fishery*, 62 J. POL. ECON. 124 (1954). For accounts tracing the tragedy of the commons insight to H. Scott Gordon, see A. MCEVOY, THE FISHERMAN'S PROBLEM 10-11 (1986); Ciriacy-Wantrup & Bishop, *"Common Property" as a Concept in Natural Resources Policy*, 15 NAT. RESOURCES J. 713, 719, 722 (1975).

6. *See* W. OPHULS, *supra* note 3, at 148-50.

7. Even the conservationist might opt not to restock, given the possibilities that hatchery-bred fish might harm the genetic makeup of the wild breeds. *See* Goodman, *Preserving the Genetic Diver-*

In short, whether the beneficial act is negative (moderating one's take) or positive (restocking the pond), the benefits go largely to others, who take a free ride on conservationist behavior.[8] In game theory language, all these situations—the fishing hole, the environment, and the "commons" generally—represent variants on a problem called an n-person prisoners' dilemma.[9] In such a scenario, any given player has reason to suspect that the other players in a common effort will not cooperate, but rather will "defect," and each individual player's best option then is to defect too—even though taken together as a group, everyone might be better off if all cooperated. Thus no one (except suckers, altruists, and fanatics) acts to conserve the fishing area, and depletion is its predictable ultimate fate.

Now, as with other dilemmas of this sort, we can at least imagine that the participants might do something about it. They could form a fishpond committee, for example, and could then police the individual fish harvest, or perhaps they could charge restocking fees to all the members. But if the numbers of fisherfolk are too large or heterogeneous, that option also becomes much less likely. For one reason, some of the fishers may shirk the organizing work; and for another, even if they do get organized, it is still difficult to make sure that everyone does her respective duties in conserving and restocking. Thus organizing and management efforts face the same kinds of obstacles that conservation or restocking efforts did: On the whole, nobody wants to be a sucker and do all the organizational work, and consequently, that work may well not get done at all.[10]

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sity of Salmonid Stocks: A Call for Federal Regulation of Hatching Programs, 20 ENVTL. L. 111, 130-41 (1990).

8. Dean Lueck distinguishes the negative and positive aspects by distinguishing between two sorts of "commons": one sort has open access, and the characteristic problem is overuse of the common resource; the second sort has common ownership or output sharing, and the characteristic problem is shirking. *See* D. Lueck, Egalitarian Rules and the Productive Role of Common Property 3, 5-11 (Nov. 1990) (unpublished manuscript) (available from author).

9. For an explanation of the prisoners' dilemma, see Hirshleifer, *Evolutionary Models in Economics and Law: Cooperation Versus Conflict Strategies,* 4 RES. L. & ECON. 1, 17 (1982); for an analysis of the dilemma when a large number of participants are involved, see E. ULLMANN-MARGALIT, THE EMERGENCE OF NORMS 25-27 (1977). In the prisoners' dilemma story, two prisoners are separated and offered a choice between confession (defection) and staying silent (cooperation); if both stay silent, both receive relatively light sentences, but if one confesses while the other stays silent, the silent one is punished severely while the confessing one goes free. Thus, both prisoners are motivated to confess, which ultimately makes both worse off. The story has become a kind of code for situations in which the collective interest demands cooperation while the best individual strategy is defection. The "n-person" prisoner's dilemma simply substitutes a group (of some given number) for one of the parties.

10. My former colleague James Krier makes this observation on almost every occasion that the subject arises. *See* J. KRIER & J. DUKEMINIER, PROPERTY 46-47 (2d ed. 1988). *See generally* R.

Getting organized to overcome the overfishing problem thus entails the same commons problem that the overfishing problem itself involved. To be sure, organizing may be somewhat different from restocking the fish, insofar as we find that in everyday life there are some "political entrepreneurs" who do seem to enjoy volunteering for this sort of thing, but the usual view of these entrepreneurs is that they have to get a special return or they will not take the effort.[11] Failing such entrepreneurs, organization often does not happen; thus, moderation and restocking do not happen either, and the fishing area gradually declines to a dead sea.

The fishing story of course is not confined to fishing grounds. A similar story can be told about the littering of parks and roadsides, the "storage" of wastes in the air, the dumping of refuse in the oceans, or, indeed, about quite a lot of other human behavior. This is the classic story of unowned resources: They are likely to be overused and undercared-for, and even interested or well-meaning parties are helpless to do anything about the situation.

But sometimes, for some reason, we do get organized, whether through everyone's efforts or through those of the political entrepreneurs.[12] I will come back to this point later, but for the moment, let us take an optimistic view. Suppose we somehow do get group cooperation or find an entrepreneur who can get us off the mark: What kinds of things would help, if we could indeed do something about our environmental problems?

II. THE TIMING QUESTION: COMMONS AND CONGESTION

To answer the question, "What would help?" we need to consider the question of *when* we need help; and once again, fishing provides a good example. A fishing area might be thought of as a "congestible" resource, that is, one that can bear some joint usage, but that "congests"

HARDIN, COLLECTIVE ACTION (1982); Rose, *"Enough and As Good" of What?* 81 NW. U.L. REV. 417, 438-39 (1987).

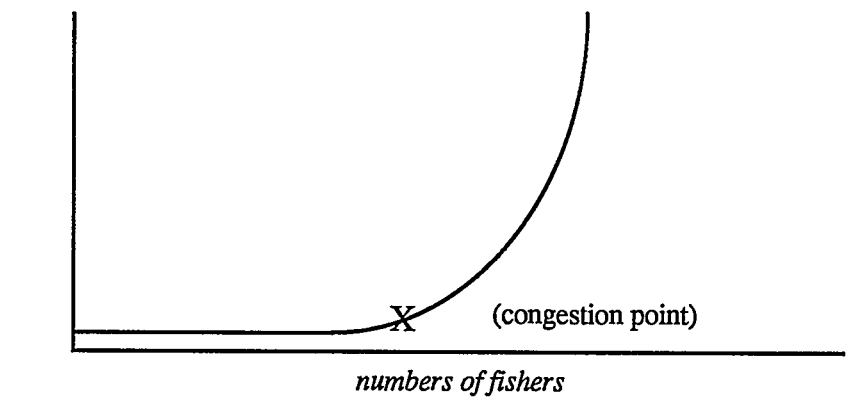
11. *See* R. HARDIN, *supra* note 10, at 35-37.

12. *See* E. OSTROM, GOVERNING THE COMMONS, 14, 18-21 (1990) (arguing that commons problems may be escaped by community organization); *see also* R. ELLICKSON, ORDER WITHOUT LAW 52-56 (forthcoming) (examples of cooperative behavior among neighbors that suggest a norm of neighborliness); R. FRANK, PASSIONS WITHIN REASON: THE STRATEGIC ROLE OF THE EMOTIONS (1988) (concerning role of emotion in arriving at cooperation); E. ULLMAN-MARGALIT, *supra* note 9, at 21 (noting that cooperative solutions to prisoners' dilemma problems may be solved through the development of stabilizing norms); Acheson, *The Lobster Fiefs Revisited,* in THE QUESTION OF THE COMMONS: THE CULTURE AND ECOLOGY OF COMMUNAL RESOURCES 37 (B. McCay & J. Acheson eds. 1987) [hereinafter THE QUESTION OF THE COMMONS] (examining cooperative behavior in fishing community).

when uses increase too much.[13] Let me give some examples, beginning with a negative. An ice cream cone, at least under ordinary circumstances, is not a congestible resource; it is rather an individual resource, "congested" from the start. An ice cream cone normally only has one user, and that's it. If someone else tried to lick your ice cream cone, you would notice right away, and unless she were a close friend, you would probably try to protect the cone from the interloper. But with some other resources, several people can be users in common, at least up to a point—a milkshake might allow two consumers, if they are friendly, whereas a swimming hole might allow, say, ten or fifteen users. Beyond some number, however, these resources start to become scarce or congested with users. To take the fishing example: Up to a point, a number of people can fish and no one really notices, because everyone can take all that he wants and the fish can still regenerate at a level that seems acceptable. But beyond some point of congestion, additional fishing hurts all the resource users—a little at first, and then with increasing detrimental consequences.

Figure 1 illustrates how the perceived resource depletion costs would look if charted.[14]

Figure 1: RESOURCE DEPLETION COSTS



Congestible resources such as fishing areas are typically the subjects of environmental problems. Their common use seems unproblematic

13. *See, e.g.*, Barnes, *Enforcing Property Rights: Extending Property Rights Theory to Congestible and Environmental Goods*, 10 ENVTL. AFF. L. REV. 583 (1982-83).

14. This graph is a variant on the one presented in Barnes, *supra* note 13, at 593.

under conditions of low consumption; under these circumstances there is plenty for everyone, and so no one tries to patrol additional fishing. But at some point, if increased fishing makes the resource perceptibly scarcer, and perhaps even threatens the resource with ruin, we collectively start to feel the pinch. But at that point we may be quite uncertain about what to do next, in part because of our established habits and practices. Even if those practices cause discomforting depletion, we may find them difficult to change.[15]

Besides, we sometimes lack consensus about the point at which we should feel uncomfortable with further depletion. Even whooping cranes at their lowest ebb proved to be "renewable," but many people used to feel (and some still feel) that the crane level was uncomfortably low.[16] On the other hand, most of us might not want to restrain all our activities so as to allow whooping cranes to renew themselves at the highest conceivable level, because that might entail major sacrifices of other things we think we need even more. To take another example, air pollution: Most people are willing to put up with some level of air pollution, because we think we need to do so for our transportation and electricity, among other things, which in themselves may be more iinportant to our health and well-being than the next increment of clean air.[17] Thus, on balance, we may be comfortable with something less than the most pristine air we conceivably could have—that is, we may be willing to put up with some "congestion" in air use.

Nevertheless, at some pollution level the balance may tip in favor of halting further depletion of clean air and allowing the resource to renew itself at a given level—a level that is compatible with what we perceive to be necessary for our health and aesthetic needs. I would like to side-step the balancing question for the moment and to suppose that the balance has been struck at least for the time being, and that we know the level—call it MAXLEVEL—at which we want to hold resource use.[18] Once we

15. The problem is compounded when Group A depletes a resource, but only Group B notices the depletion. For example, with acid rain, Mid-Western coal-burning plants emit air-borne particles that cause their damage chiefly in New England and elsewhere.

16. *See* Montgomery, *Whooping Cranes Stretching Out,* Los Angeles Times, Sept. 17, 1990, at B3, col. 1.

17. *See* Krier, *Commentary: The Irrational National Air Quality Standards: Macro- and Micro-Mistakes,* 22 UCLA L. REV. 323, 328 (1974).

18. In principle, we may be able to calculate an exploitation level that maximizes economic rents for a given renewable resource, from the point of view of the exploiting parties; this is what Gordon's classic article about the fisheries did. *See* Gordon, *supra* note 5, at 129-41; *see also* Townsend & Wilson, *An Economic View of thc Tragedy of the Commons,* in THE QUESTION OF THE COMMONS, *supra* note 12, at 311, 313-18. In practice, however, a number of other interests, aside from those of the exploiting parties, often bear on an ideal MAXLEVEL. An ideal MAXLEVEL for a given fish type, for example, might depend not only on commercial fishers' rent-maximizing

have decided a resource's MAXLEVEL, our question becomes, How can we change our ways and restrain our use of the resource?

One possibility, of course, is to try to make a given resource less attractive to people—for example, we might change the name "Rainbow Trout" to "Bug-snarfer."[19] Most of our legislation, however, ignores direct means of lowering people's desires for resources and instead attempts to restrain how much they use or take from those resources. Following this lead, the next Part will concentrate on those types of management strategies that restrain use.[20]

III. FOUR STRATEGIES OF COMMONS MANAGEMENT

What are the ways we can usefully categorize commons management strategies? Some writers focus on who the "strategists" are, and they divide strategies into "private" and "public," according to whether controls are imposed by insiders (private) or by outside authorities (public or governmental).[21] This may be a useful division; the identity of the controlling body as "private" or "governmental" may identify some issues, particularly the "rent-seeking" and public choice problems that are thought to distort public bodies' decisionmaking process.[22] Nevertheless, private and governmental managers often use techniques that are quite similar in content—as has been shown in the classic case of the fisheries.[23] The public/private divide, taken alone, misses the substantive con-

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catches, but also such matters as the recreational enjoyment of viewing and photographing fish; profits or losses from increases in competing species, as the exploited type diminishes; alternative uses of fish habitat for real estate development or pollution storage, and so on. In principle, a single owner of all relevant resources could presumably arrive at a ideal MAXLEVEL for all of them, equalizing values at the margin. In practice, since we have no single owner, I assume that MAXLEVEL decisions are at least partially communal or political, as a kind of second-best decision-making process.

19. *Cf.* Miller, *When Bureaucrats Cast for Fish Names, Be Prepared to Wait,* Wall St. J., May 1, 1980, at 1, col. 4 (describing government efforts to change the common names of some fish, e.g., ratfish, grunt, hogsucker, mudblower, lizardfish, roach, and croaker—to make them more commercially attractive).

20. Insofar as resource management schemes impose increased costs on resource users, of course, demand for the resource will be reduced. *See* Barnes, *supra* note 13, at 592-95 (noting effect of controls on resource use).

21. *See, e.g.,* Ostrom, *Institutional Arrangements for Resolving the Commons Dilemma: Some Contending Approaches,* in THE QUESTION OF THE COMMONS, *supra* note 12, at 250-51.

22. *See, e.g.,* G. LIBECAP, CONTRACTING FOR PROPERTY RIGHTS 16-26 (1989) (outlining private and political impediments for definitions of entitlements); McChesney, *Rent Extraction and Rent Creation in the Economic Theory of Regulation,* 16 J. LEGAL STUD. 101, 102-03 (1987) (arguing that politicians seek own well-being in political decisions and make demands to which the private sector responds). *See generally* J. BUCHANAN, R. TOLLISON & G. TULLOCK, TOWARD A THEORY OF THE RENT-SEEKING SOCIETY (1980) [hereinafter RENT-SEEKING SOCIETY].

23. *See* Acheson, *supra* note 12, at 59-60 (describing governmental moves to adopt private control patterns of lobster fishing). A similar blurring of public and private approaches occurs in the

tent of these various techniques or strategies, whereas the focus of this Article is precisely on those substantive characteristics of management, regardless of whether the managers themselves are public or private.

What, then, are the substantive types of commons management techniques? One economist, Stephen Cheung, has made a very useful list, and indeed he listed his strategies more or less in ascending order of the difficulty and expense of administration.[24]

(1) *Do-Nothing.* First, of course, even before we get to Cheung's strategies, we could adopt the very easiest strategy and do nothing—that is, we could leave our fishing ground an open-access commons. This no-control option, which I rather boringly call DO-NOTHING, is a kind of baseline over against which we can measure the effectiveness of other strategies.

(2) *Keepout.* Second (and now we are taking up Cheung's list), we could exclude newcomers, a strategy to which I will refer to as KEEPOUT: Once we get to a congestion point, where we feel the pinch of overcrowding and resource depletion, we keep out everybody else. Our "insider" fishers, on this model, would continue to fish in any way they chose, but they would cut off the access of newcomers. This would mean, of course, that although the fish levels might be preserved, they would only be accessible to the insiders—outsiders wouldn't get any.

(3) *Rightway.* Third, we could regulate the way in which the resource is used or taken, effectively prescribing the methods by which users may take the resource; I refer to this strategy as RIGHTWAY. In our fishing area, for example, we could limit fishing to fly-casting and not allow trawling or the giant fishnets that have been in the news lately as destroyers of ocean wildlife.[25] Under this RIGHTWAY scheme, fishing would be open to all who want to fish, but only if they fish in a certain way—a way, we hope, that limits the overall number of fish they are likely to catch.

(4) *Property.* Finally, we could manage the fish by giving individualized property rights to them, a strategy that I term "PROP." For example, a PROP regime could set a limit on the total allowable take of fish, and then auction off fishing rights to those who wanted to purchase such

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governance structure of private residential communities, which manage common property in ways resembling public governance, including majoritarian rule-formation and tax-like assessments. *See* Reichman, *Residential Private Governments: An Introductory Survey,* 43 U. CHI. L. REV. 253 (1976); *see also* Alexander, *Dilemmas of Group Autonomy: Residential Associations and Community,* 75 CORNELL L. REV. 1 (1989).

24. Cheung, *The Structure of a Contract and the Theory of a Non-Exclusive Resource,* 13 J.L. & ECON. 49, 64 (1970).

25. *See* Egan, *Salmon "Pirates" in Pacific Assailed,* N.Y. Times, May 14, 1991, at A1, col. 1; Stevens, *Large Drift-Nets Move to Atlantic,* N.Y. Times, Aug. 14, 1990, at A1, col. 1.

rights. In a sophisticated version, the fishers could trade these rights among themselves. Alternatively, we could try to figure out a per-fish or per-pound price that would discourage fishing above an acceptable level, and then require each fisher to pay a bounty on each unit taken.

There are of course equivalents to all these strategies in our past, present, and hypothetical future environmental law. Take air pollution control (to which I will return in more detail later): Strategy One, DO-NOTHING, is represented by the "anything goes" attitude to air pollution that we used to find—especially in undeveloped areas. Strategy Two, KEEPOUT, corresponds to a kind of crude land-use control, in which new facilities are halted; new shopping centers, for example, have sometimes been disallowed on the ground that they may increase air pollution from the auto traffic that they attract.[26]

Strategy Three, RIGHTWAY, is widely reflected in our law. The prohibitions on "unreasonable use" in classic nuisance law, although rather malleable, effectively restrain the manner of using air; these prohibitions disallow practices that deviate from the customary and normal.[27] In a much more complex fashion, the modern "command and control" environmental measures have also prescribed the manner in which air may be used, but in a highly specific fashion. These measures have demanded that would-be polluters use the air only in the "right way"; that is, they may emit pollutants into the air, but only through the use of specific control equipment (the "best available technology") such as scrubbers to contain the emissions from coal burning exhaust stacks or catalytic converters on automobiles.[28]

Finally, Strategy Four, PROP, through which resource rights are turned into individual entitlements, is a technique that has been much discussed lately, both in academic literature and in legislative proposals

26. *See, e.g.*, Manchester Envtl. Coalition v. EPA, 612 F.2d 56 (2d Cir. 1979) (Clean Air Act prohibits EPA from allowing state to drop indirect source review program without considering effect on adequacy of air pollution control plan). These so-called "indirect source" controls have been controversial when imposed by federal administrators, however, as is evident in this case and in the congressional response that forbade the EPA from imposing such land use restrictions on unwilling states. *See* Clean Air Act, § 110(a)(5)(A), 42 U.S.C. § 7410(a)(5)(A) (1988).

27. *See, e.g.*, Middlesex Co. v. McCue, 149 Mass. 103, 21 N.E. 230 (1889) (no nuisance action against cultivation in ordinary and usual manner).

28. *See, e.g.*, Clean Air Act (pre-1990), § 111(a)(1), 42 U.S.C. § 7411(a)(1) (1988) (technological performance standards for new stationary sources); *id.* § 202(a)(3)(A)(iii), 42 U.S.C. § 7521(a)(3)(A)(iii) (same for autos). The 1990 amendments to the Clean Air Act no longer refer to technology in the performance standards for stationary sources, though they still do so for autos. *See infra* note 67.

for purchasable and tradeable pollution rights.[29] Indeed, Congress has now incorporated this strategy into the controls on acid rain.[30]

These various strategies are not necessarily mutually exclusive—and indeed they are often combined. For example, KEEPOUT is often combined with either RIGHTWAY or PROP. In the customary pattern, newcomers are excluded altogether (KEEPOUT), while the "insider" oldtimers only use the resource in a well-established customary manner (RIGHTWAY), or according to customary limits on total use (PROP). Such practices are common, for example, among established shellfishers and users of commonly owned grazing areas.[31] A somewhat different combination of the KEEPOUT and RIGHTWAY strategies appears in some modern air pollution controls: Pre-existing polluters have been treated as if they had a common KEEPOUT entitlement to foul the air more or less as they had in the past, whereas the "kept-out" *new* polluters have been required to install highly technical RIGHTWAY pollution control devices.[32]

Cheung's article catalogued these generic strategies but did not specify how to choose among them, although he suggested that in principle a choice should be possible. The way to make that choice is to consider

29. *See, e.g.,* Ackerman & Stewart, *Reforming Environmental Law,* 37 STAN. L. REV. 1333 (1985) (economic incentive systems are one of many alternatives to the present ineffective, costly, centralized regulatory system); Dudek & Palmisano, *Emissions Trading: Why is this Thoroughbred Hobbled?,* 13 COLUM. J. ENVTL. L. 217 (1988) (discussing and advocating market-based approaches to pollution control).

30. Clean Air Act Amendments of 1990, Pub. L. No. 101-549, § 401, 104 Stat. 2399 (codified at 42 U.S.C.A. §§ 7651-7651o (West Supp. 1991). The Amendments establish annual allowances for sulphur dioxide emissions from coal-burning electric utilities and permit trading of allowances among utility units. *See* 42 U.S.C.A. §§ 7651b-7651e (West Supp. 1991).

31. For an account of this behavior among fishers, see Acheson, *supra* note 12, at 49-51 (describing lobsterfishers who keep all outsiders from entering fishing grounds, but among themselves limit only number of traps set, not total catch); for graziers, see Cox, *supra* note 4, at 55 (medieval village common property limited to insiders, insiders in turn limited in types and numbers of pasturing animals).

32. *See* Clean Air Act, §§ 111, 204, 42 U.S.C.A. §§ 7411, 7523 (West 1983 & Supp. 1991). Old plants may be subject to state controls under other parts of the Clean Air Act, but these controls may be much less stringent. *See* National-Southwire Aluminum Co. v. EPA, 838 F.2d 835, 836 (6th Cir.) (plant effort to avoid redesignation as "new source," subjecting it to additional technology requirements), *cert. denied,* 488 U.S. 955 (1988). The major arguments in favor of this policy focus on relative costs and redistribution: 1) retrofit costs for old plants are higher than costs of pollution control equipment for new plants; 2) old devices, especially cars, are typically owned by lower income segments and to impose retrofit costs on these groups amounts to unaceeptable redistribution. Favoritism to old users can be criticized on grounds of fairness and efficiency; a fervent critic is Peter Huber. *See, e.g.,* Huber, *The Old-New Division in Risk Regulation,* 69 VA. L. REV. 1025 (1983) (new equipment may pose fewer risks and often should be encouraged). *See also* Ackerman & Hassler, *Beyond the New Deal: Coal and the Clean Air Act,* 89 YALE L.J. 1466, 1478 (1980) (noting but rejecting arguments favoring old plants).

costs—to select the strategy that limits use at the lowest cost. This determination, however, is context dependent.

IV. MANAGEMENT COSTS AND RENT DISSIPATION

Cheung and others have made explicit one important insight about managing resources: It costs something to manage resources.[33] Thus generally speaking, even if we can find a MAXLEVEL of resource use that we think most appropriate, we need to recognize that holding use to that level will not be done for free. We still need to find the strategy that holds use at the appropriate level, *at the lowest total cost.*[34]

What are the cost components of these various strategies? Any answer, of course, will grossly oversimplify, but one has to start somewhere, and so I propose the following three components:

(1) *Administrative or system costs.* These comprise the system-wide costs of running a management strategy, including both organizational and policing costs.

(2) *User costs.* These are the costs of extra equipment, such as scrubbers or catalytic converters, that individual resource-users must acquire to satisfy the requirements of any given management strategy. Because many of these costs are technological, I will sometimes call them "technology costs."

(3) *Overuse or failure costs.* This cost category accounts for breakdowns and slippages, and it comprises the continuing "externalities" under a given strategy—the continuing conflicts and damage caused by resource depletion that escapes the control system. These costs reflect the point that no management strategy is perfect; because of management failure, we may still wind up somewhere beyond our acceptable MAXLEVEL—that is, beyond the point at which we feel it is healthy, safe, or comfortable to permit continuing resource depletion.

Now, when we choose one or another control strategy, the combination of administrative costs, user-technology costs, and overuse/failure costs will vary according to what the literature of common resources

33. *See* Cheung, *supra* note 24, at 64, 67; Krier, *supra* note 17, at 326; D. Lueck, *supra* note 8.

34. *See* Krier, *supra* note 17, at 326. Krier's article, among other things, considers the costs of overcontrol—that is, setting controls too stringently, and failing to account for the benefits that may come from some use of air resources (pollution). For the most part, this Article holds that cost constant by assuming that we have already chosen the MAXLEVEL we want; the costs considered here are the management costs of holding resource use to that level. *See supra* text accompanying note 18. For the effect of management costs on MAXLEVEL choice, *see infra* text accompanying notes 41 & 100.

often refers to as "pressure."[35] "Pressure" on a resource occurs when more people try more intensely to use the resource.

Why does a resource come under pressure? One way to explain this is through the economic concept of "rents." It is often said that there are rents to be gained in natural resource exploitation;[36] this means that a given resource may yield revenues and pleasures above the cost of taking the resource. "Rent" is the name given to such excess values. These rents are of course desirable to have, and when rent-yielding resources are up for grabs, they tend to attract people who try to grab them.[37] When a resource's rents are low, people may more or less ignore the resource; under those circumstances, the few users of the resource may enjoy whatever little-known or idiosyncratic "rent" they derive without competition or congestion from other seekers. In the fishing example, this is the stage in which there is little pressure on a fishing ground—only a few fanatical fishers bother to buy the equipment and brave the cold to catch the elusive trout.

But if more people value the resource (for example, if trout-eating or trout-fishing becomes a fad) or perhaps if the resource becomes cheaper to exploit (for example, if new nets or boats are invented), the difference between the resource's value and the cost of exploitation may widen.[38] That difference, of course, is the resource's rent, and as it becomes larger, more people will undertake greater efforts to exploit the resource. In our fishing example, increasing rents translate into increasing pressure on the fishing area, which becomes crowded with rent-seeking competitors for fish.

The problem is that if more and more people try harder and harder to catch fish, so much effort may be poured into fishing that the fish are threatened with depletion, and the cost of catching them will rise while the return declines. Thus unless something restrains the fishers, their competition for the fish (or other renewable resources) dissipates the very rents that attracted them in the first place—rents that might have been preserved by exploiting the resource at a more appropriate level.[39] It is for this reason—to hold down resource exploitation and prevent rent dissipation—that we institute management regimes for resources.

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35. In the various articles on "commons" in THE QUESTION OF THE COMMONS, *supra* note 12, the reference to "pressure" comes up often. *See, e.g., id.* at 105, 126, 129, 247, 256; *see also* G. LIBECAP, *supra* note 22, at 15 ("fishing pressure"), 64 ("grazing pressure").

36. *See* Gordon, *supra* note 5, at 129-30, 141.

37. In some contexts, these would-be acquirers have been called "rent-seekers." *See* BUCHANAN, *Rent Seeking and Profit Seeking*, in RENT-SEEKING SOCIETY, *supra* note 22, at 3 (1980) (focusing on "rents" and "rent-seeking" in goods allocated by governmental action).

38. G. LIBECAP, *supra* note 22, at 16.

39. *See* Gordon, *supra* note 5, at 131-32.

Thus, a higher rent level attracts the exploitation efforts that dissipate rents, or alternatively, that induce us to institute management systems to avoid rent dissipation.[40] This relates back to the earlier discussion of a MAXLEVEL for resource use:[41] When we select such a MAXLEVEL, we are effectively selecting a use level at which we think that the resource's rents, broadly conceived, are at their greatest, and our management system is supposed to help us maintain that MAXLEVEL, so that over-exploitation does not dissipate those rents. *The problem is that management systems dissipate rents, as well.* Under any management strategy, there will be some mix of system costs, user costs, and overnse/failure costs, and all these costs dissipate rents.[42]

The trick, then, is to select the management strategy that holds the total of all these rent-dissipating factors to a minimum. The next Part will illustrate how the solution to this trick depends on how much pressure we are putting on resources.

V. COMPARING THE COSTS OF MANAGEMENT STRATEGIES: WHICH IS BEST?

It should now be clear that our goal should be to choose the least-cost management strategy, that is, the one with the lowest mix of rent dissipating factors. What follows is a series of graphics that illustrate the cost mixes of different management strategies under different levels of pressure on a resource. They represent the idea that larger rents themselves indirectly bring about higher management costs, because at higher rent or pressure levels, more institutional effort is required to restrain overuse. More technically, then, these graphs depict the relationships between rents and rent dissipation;[43] in each, the horizontal line repre-

40. A similar idea ean be inferred from G. LIBECAP, *supra* note 22, at 16. Libecap noted that a resource's price increases (or production cost decreases) can add to motivation to "adjust property institutions" to prevent rent dissipation. Presumably "adjustment" costs something—that is, it dissipates rents.

41. *See supra* text accompanying notes 18 & 34.

42. *See, e.g.,* Krier, *supra* note 17, at 326 (total costs of pollution control comprise costs of pollution itself plus costs of preventing pollution). There is a tendency in some property rights literature, however, to downplay the costs of management in the form of conventionally defined property rights, and to accept without more that conventional property rights are less expensive than other management systems. For example, in Anderson & Hill, *The Race for Property Rights,* 33 J.L. & ECON. 177, 181-82 (1990), the authors note the rent-dissipating effects of Western land acquisition by homestead and squatting, and compare these methods unfavorably to transfers by sale; but no mention is made of the possibility that transfers to homesteaders and squatters (i.e. on-the-spot farmers) might have economized on policing costs, by comparison to sales (to at least some absentee owners).

43. There are a number of interesting graphics in the fishery branch of economic thinking. I found the most helpful to be Gordon, *supra* note 5, at 137-140, along with the explication by Townsend & Wilson, *supra* note 18, at 314-15, 317. These graphics show a relationship between fishing

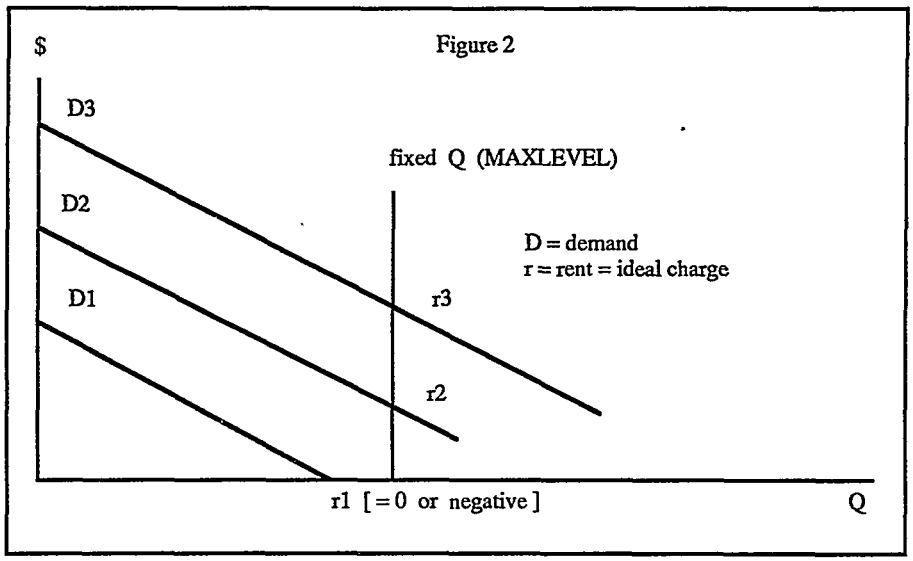
sents pressure on the resource (technically, rents from the resource),[44] whereas the vertical line represents the total costs of the given control

"effort" (on the horizontal axis), and fishing revenues together with costs (on the vertical axis), and illustrate the point that maximum economic yield is the rent-maximizing point at which costs are at the greatest distance below total revenues. They also illustrate, of course, that the maximum economic yield is not an equilibrium point if fishing effort is unrestrained.

I was sorely tempted to follow these established graphics, and to use "effort" on the horizontal axis. But in an important way, "effort" simply responds to rents (i.e., the prospect of rents makes fishers expend "effort"). More importantly, the direct use of rents (or "pressure") instead of "effort" enabled me to graph the rising costs of management regimes under increasing demand for a resource. The picture would be muddied by using "effort" on the horizontal, since effort is one of the things changed by management. *See infra* notes 44-45.

44. Although I am using the less formidable term "pressure," technically speaking, this pressure on the resource should be considered the resource's "rent," since it is increasing rent that attracts more numerous and more intense efforts to take a resource.

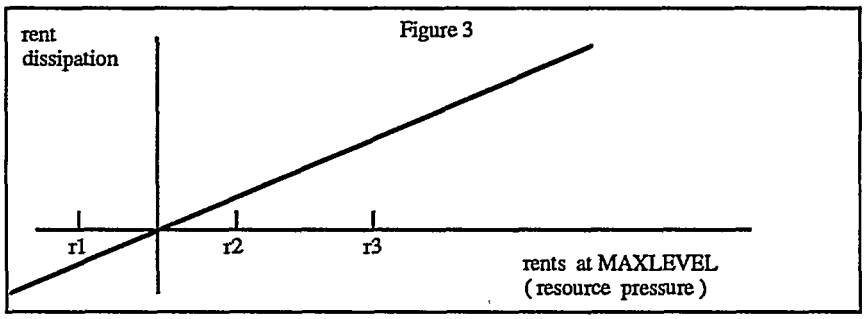
One could envision any given pressure or rent level as the amount that the whole community of fishers would charge itself, in order to ration the fish taken and keep the total fish at the appropriate renewable level. The correct amounts would of course vary with the demand for the fish (no matter what the source of that demand). Thus in a conventional scheme, the supply of fish would be a vertical line (since the number to be taken is fixed at some renewable MAXLEVEL), intersected by the demand line(s). Those intersections (r1, r2, etc.) represent the ideal charges to constrain usage at the chosen MAXLEVEL; if they could be costlessly imposed on fishers, they would effectively limit fishers to the ideal harvest amounts that would allow fish to renew at the level they want. The r1 intersection represents a low demand condition, where few want to fish and exploitation falls below MAXLEVEL, so that no charges need be imposed.



In the text graphs, in effect, I turn these intersections on their side to the horizontal, so that rent levels r1, r2, etc. are represented as increasing "resource pressure" levels. The verticals in the text graphs, however, represent dissipation of rents due to management costs and continued overfishing.

strategy, (dissipation of rents under that strategy), due to its mix of system costs, user costs, and failure/overuse costs.[45]

I begin with Strategy One, DO-NOTHING: In essence, the costs of DO-NOTHING simply replicate the congestion cost curve. As people want a resource more, they work harder and harder to get it. In the absence of any constraints, their increased efforts translate directly into an increased total exploitation; but, of course, exploitation depletes the resource, and as this happens, individual exploiters may wind up with less and less, as their increasing efforts cause ever-greater difficulties to one another.[46] Thus, their ever-more-strenuous efforts to gain the resource's rents dissipate those very rents.[47] The chief costs of the DO-



The text graphs thus show a relationship between increasing rents (horizontal) and rent dissipation (vertical). The relationship is positive because increasing rents attract rent-dissipating activities. For undissipated rents, *see infra* note 45.

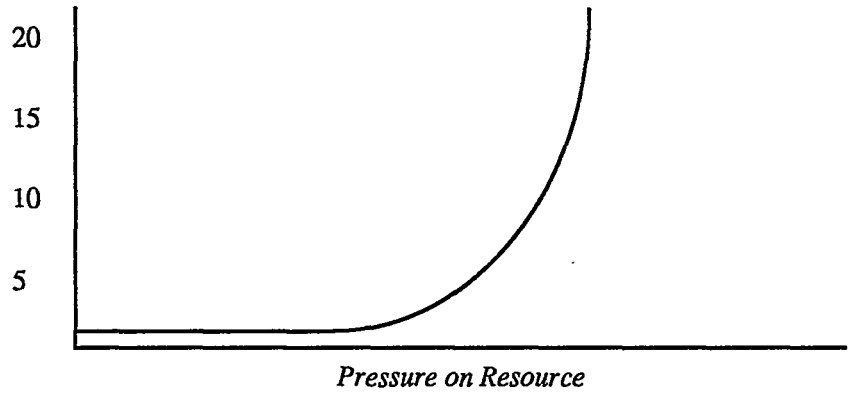
45. The remaining undissipated rents may benefit different parties. Under the DO-NOTHING, KEEPOUT, and RIGHTWAY strategies, the residual rents go to the fishers themselves, whereas under a PROP regime, the residual rents may be collected by the management or government rather than the fishers, perhaps to be used for restocking or other resource conservation measures. No matter who gets these rents, the object in choosing a management strategy should be to maximize the residual rents—that is, the difference between rents and dissipation of rents. If rents are completely dissipated by a management strategy—for example, if under a KEEPOUT strategy, it costs a group of hunters more to guard their hunting grounds than the animals bring them—they may either abandon efforts to manage the resource or shift to a less rent-dissipating management scheme.

46. *See* Townsend & Wilson, *supra* note 18, at 313-17. The authors use a common graphic representation of this feature of fishery exploitation, suggesting a smooth bell-shaped relationship between fishing catch and fish depletion: At first, the catch increases with increased effort, but then peaks and declines as the fish are depleted. The authors point out, however, that an alternative theory suggests a discontinuity in the relationship between catch and depletion. The idea is that wildlife may continue to regenerate, albeit at somewhat unpredictable levels, up to some critical exploitation level; but beyond that critical point, the wildlife stock will deplete very rapidly. *Id.* at 321-23. Some historical American examples might corroborate this view; for example, the sudden depletion of previously numerous passenger pigeons or bison. *See* J.A. TOBER, WHO OWNS THE WILDLIFE? THE POLITICAL ECONOMY OF CONSERVATION IN NINETEENTH-CENTURY AMERICA 93-102 (1981). Fear of passing such a point-of-no-return may also animate current discussions of other resource overuse issues—notably the "greenhouse effect," thought to arise from the release of air pollutants into the upper atmosphere.

47. This was the chief message of Gordon's classic article about the fisheries, *see* Gordon, *supra* note 5; in the absence of restraints, fishers are attracted into fishing by the prospect of average

NOTHING strategy, then, fall into the category of overuse or failure costs. When the resource is depleted substantially, the discomfort, conflict, and diminished return entailed by overuse may be substantial. Because of these overuse costs, as Scott Gordon laconically observed, fishermen are not wealthy.[48]

Figure 4: STRATEGY 1 *DO-NOTHING* (_____)



But sometimes the DO-NOTHING strategy might be most appropriate. When demand for the underlying resource is slight, DO-NOTHING is especially cheap: There are no administrative costs for organization and policing; no user technology is specifically dedicated to control; and because no one is trying very hard to get the resource, overuse or depletion costs are still low, if they are felt at all.[49] But once again, if values rise, and more and more people attempt to get the resource, overuse costs rise—perhaps even dramatically—and they may overwhelm any savings that can be made by dispensing with administra-

productivity; that is, they observe how much the average fisher takes, but this average catch of the earlier fishers is higher than the newcomer's marginal productivity (i.e., the amount that the last additional fisher adds to the total take). Since each succeeding newcomer adds less to the total catch than earlier entrants did, all the fishers' average catches decline; thus the newcomer's additional fishing will deplete the resources for other fishers as well as for himself and bid away rents. Where fishers do manage to limit access, however, they may enjoy higher catches with less effort. *See* Acheson, *supra* note 12, at 55-57.

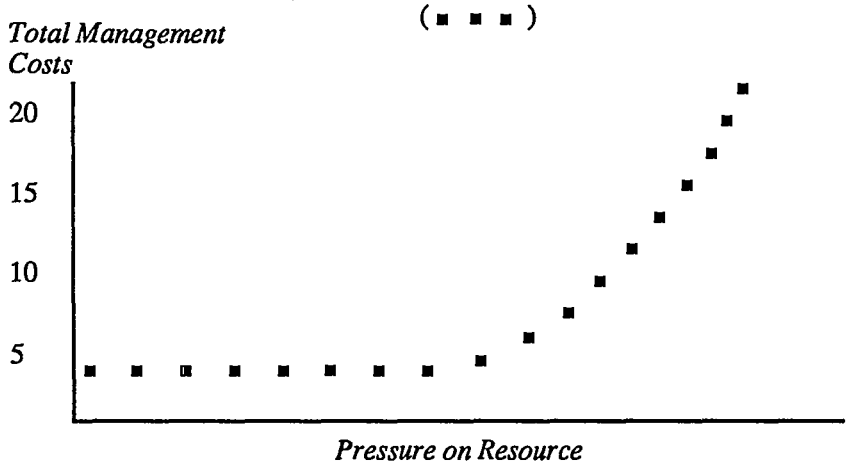
48. Gordon, *supra* note 5, at 132.

49. *See* Yandle, *Resource Economics: A Property Rights Perspective,* 5 J. ENERGY L. & POL'Y 1, 5 (1983) (in conditions of plenty, cost of introducing property institutions may exceed benefits).

tive and technical controls.[50] Aside from fishing, a familiar example might be a pleasant, open-access, town beach that is "discovered" by outsiders, where the resulting overcrowding leads the townspeople to reconsider open-access and to think of more active strategies for limiting access.

One strategy that the townsfolk (and the fisherfolk) are very likely to think of is the second strategy, KEEPOUT, which abandons the open access of DO-NOTHING, and instead excludes outsiders or new uses.

Figure 5: STRATEGY 2 *KEEPOUT* (■ ■ ■)



As Figure 5 suggests, when we introduce KEEPOUT, administrative or system costs are obviously higher than DO-NOTHING; someone may have to do a good deal of organizational work to get the control system introduced, especially if many people see an advantage in the older system of open access. The system also requires a monitoring effort: The insiders may have to police the pond, or hire police to keep interlopers off, and they may need boats and weapons. And, like any new system, this one may not work very well at the outset, so the failure/overuse costs may remain fairly high. Finally, there are morale costs, especially at the beginning: Some may grumble that we really don't need all this control activity, because there are still plenty of fish, and keeping out new fisherfolk just looks stingy and ungenerous.

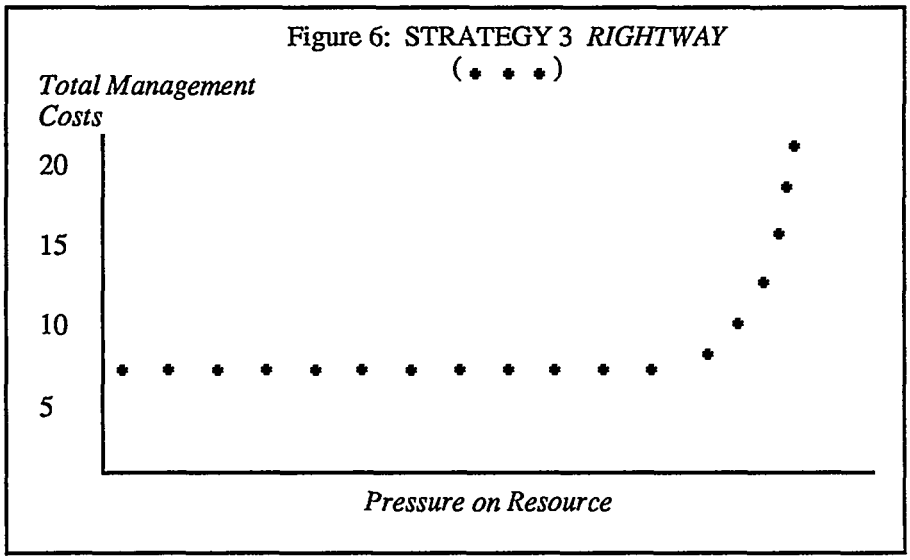
But if pressure on the fishery continues to rise, and more and more people try to take the fish, then the system may seem worth the effort (at

50. G. LIBECAP, *supra* note 22, at 12-14 (common pool losses motivate efforts to establish more exclusive property rights).

least to the beneficiary insiders)—that is, its total costs may look lower than a "do-nothing" solution. Once the system is in place, we don't have to do much more organizing work, or buy a whole new fleet of police boats. Besides, the system may work better with experience, and it may really reduce total take from the fishery, no matter how hard outsiders try to break the system. Morale issues may improve too, once the homefolks grow accustomed to the system; once they think it is doing them some good, they may be quite willing to enforce it.[51] The increasing outsider disgruntlement may offset this gain, however.

Indeed, supposing we continue to move further out on the horizontal line of pressure, outsider poachers and interlopers may overrun the KEEPOUT control system. Insiders may have to hire more and more cops and boats, perhaps with less and less effect; thus policing costs rise, as do the failure costs of conflict and depletion.

One way to deal with this problem is to permit the outsiders to enter, but to control the means by which all fishers can take the resource—that is, to move to Strategy Three, RIGHTWAY, that controls the *way* the resource is used.



With this strategy, we move to something akin to nuisance law, or to some kindred control regime that specifies *how* people are allowed to use resources. One of the surreptitious attractions of RIGHTWAY, in fact, is that it may not be so far from KEEPOUT, in that established resource

51. *See* Acheson, *supra* note 12, at 44-45, 52-57 (describing "perimeter-defended" lobster fishing areas).

users are apt already to have the prescribed boats or rods or whatever. But RIGHTWAY does have additional system costs that are likely to be higher than the costs of simply banning outsiders. Now we have to think about which fishing devices (such as nets and traps) we need to outlaw and which devices (such as fly-fishing equipment) will be permitted. Our everyday policing costs are going to be somewhat higher too, because our cops have to do more than just check on some simple sign of "insider" status, such as an I.D. card. Instead they have to look for something more complicated—i.e., whether we are pole fishing or secretly floating a few nets, as well. Just as important, there are additional user costs for the individual fishers: With RIGHTWAY, the fishers must buy poles instead of the perhaps more cost-effective nets, and they must spend a lot more time to land an equal number of fish. On the morale point, RIGHTWAY controls might cause initial resentment because they look like a lot of silly and costly formalities.

On the other hand, this strategy may be more effective for controlling total uses, even under higher levels of pressure on the fishing grounds. RIGHTWAY strategies make individual fishing efforts less productive, because our fishers could have caught more with nets than with poles.[52] Although this means that some effort is wasted, this is arguably an advantage of sorts: Greater effort now does not deplete the fish as much, and fishers impose fewer externalities on one other. And indeed, RIGHTWAY might look more attractive when there is more fishing pressure; fishers get used to the restraints and think them valuable in preventing depletion—and as a greater percentage of fishers invest in the requisite fishing equipment, it is easier for the police to catch nonconforming cheaters.

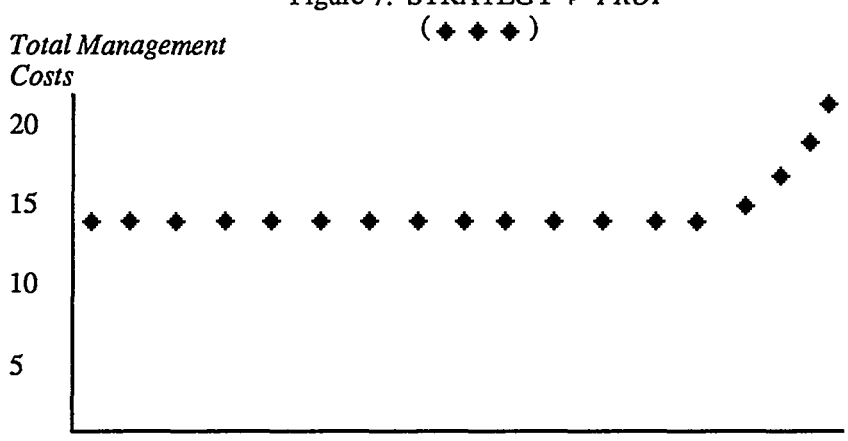
But down the line, this control strategy faces rising total costs. For one thing, RIGHTWAY requirements may squander fishers' efforts to an uncomfortable degree, and this may induce cheating, especially if more fishers arrive who don't know or care about the existing rules. In addition, RIGHTWAY controls do not explicitly attend to the total take of fish, as long as each fisher is using a pole and rod; thus RIGHTWAY restraints on nets may do little to preserve the fish if the lake is chock-full of pole-and-line fishers who fish day and night. In the end, overuse costs may start to rise, and the previously flat or slowly-rising cost curve may

52. *See, e.g.,* Agnello & Donnelley, *Property Rights and Efficiency in the Oyster Industry,* 18 J.L. & ECON. 521, 523 (1975) (rules requiring labor-intensive methods cause waste). For a proposal to increase technical costs *in order to* raise prices, see Natural Resources Defense Council (NRDC) arguments in NRDC v. EPA, 655 F.2d 318, 336-38 (D.C. Cir.) (More stringent technical requirements for automobile diesel engines should increase costs, making them less attractive, thus decreasing the amount of pollution emitted.), *cert. denied,* 454 U.S. 1017 (1981).

take a steeper turn upward. In view of this problem, we could shift to a different version of RIGHTWAY, such as permitting only flycasting, but there are costs involved in such a strategy: First, there would be a fresh round of organizing costs; second, there might be new efficiency losses in what amounts to the requirement that everyone use higher-effort equipment; third, there would be lost technical expenditures that existing fisherfolk already put into conventional pole-and-lines; and finally, because of all of the above, there could be an increased resentment and unwillingness to follow new regulations.

Rather than upping the ante on RIGHTWAY, then, we might instead turn to Strategy Four, PROP, in which we figure out how large a total fish-take is acceptable and auction off the rights as individualized entitlements.

Figure 7: STRATEGY 4 *PROP*
(◆ ◆ ◆)



A PROP strategy actually may be quite cheap for resources that are easily subdivided and individualized without external effects. But for fish, or for other environmental resources, the perceived expenses of a PROP strategy may be the highest of all. Initial organizational costs include some explicit decision about an acceptable cap on the fish harvest, and this may cause considerable conflict, because it is hard to agree on the correct MAXLEVEL—different fishers are likely to have different views on the total take that should be allowed, and if nonfishers get into the discussion, they will add yet more views.[53] Then we have to figure

53. In an analogous problem in the air pollution area, it is sometimes difficult to settle on overall ambient standards—that is, the total MAXLEVELS of air pollution that will be permitted

out and define exactly what the "property right" will consist of—numbers of fish or units of catch weight. When defining that "property right," we also have to look for a unit that is relatively easy to monitor, which illustrates yet another expense: Even in the fishing context, where rights definitions seem considerably more straight-forward than in other environmental resources,[54] monitoring and policing of those rights make up an important cost factor. Our cops cannot now check just on the fishing equipment, as they could in a RIGHTWAY regime; they have to poke around in the bilge to measure the units of fish taken, to make sure that the proper payment has been made for all units.[55]

An especially divisive issue in a PROP strategy is the initial allocation of those fishing rights: Shall we have an auction, or a giveaway to existing fishers, or some other allocation scheme? Although the answer to this question may not influence efficiency if the rights are well-defined,[56] it matters a great deal to those who want to fish; oldtimers are likely to want the rights allocated to themselves, whereas newcomers might prefer an auction or lottery. Because of the distributional issues in this decision, it is likely to be hotly contested—indeed, these distributional issues about initial entitlements, taken together with the difficulties of striking a bargain, may prevent a PROP system from getting started at all.[57] Over and above all these problems, some fishers may resist the very idea that there should be upper bounds on fishing at all, or that anyone should have to pay for fishing. This sentiment is likely to be especially strong when we are still hovering near the congestion point, where fish seem to be relatively plentiful.[58]

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for any given polluting substance. For the example of the ambient standard for lead in the air, see Lead Indus. Ass'n v. EPA, 647 F.2d 1130, 1184 (D.C. Cir. 1980) (while upholding EPA promulgated ambient lead standards against industry challenge, court acknowledged that "even the experts did not always agree about the answers to the questions that were raised"), *cert. denied,* 449 U.S. 1042 (1980); NRDC v. Train, 545 F.2d 320 (2d Cir. 1976) (suit to force EPA to adopt ambient lead standards).

54. For other environmental resources, defining the appropriate entitlement might be very tricky. For an example, see Note, *A DRASTIC Approach to Controlling Groundwater Pollution,* 98 YALE L.J. 773 (1989) (property-based groundwater control proposal; permits should be granted on basis of analysis of factors such as aquifer, soil, other groundwater characteristics).

55. Here again environmental resources may present great difficulties. *See* Yandle, *supra* note 49, at 17 (noting difficulties of measuring and monitoring groundwater for property rights scheme).

56. *See* Coase, *The Problem of Social Cost,* 3 J.L. & ECON. 1 (1960).

57. *See* G. LIBECAP, *supra* note 22, at 16-19 (noting impediments to revision of existing distributions); *see also id.* at 19-26 (noting other sources of bargaining difficulty). Some particularly dramatic examples of similar problems occur in the efforts in Eastern European countries to turn previously socialist property into private entitlements; a major controversy concerns the initial allocation of property.

58. *See, e.g.,* Gordon, *supra* note 5, at 126 (describing 19th century British arguments for relaxing all fishing restrictions, on grounds that fish were inexhaustible). The rejection of wildlife management techniques, noted among some indigenous peoples, also may be related to a belief that

Despite all these costs, the PROP strategy may look better as the pressure on fishing resources grows higher: People may grow more accustomed to the idea that undiminished fishing has costs and should be paid for. Counteracting this increased tolerance to PROP is the fact that, as fish become increasingly valuable, fishers will have to be charged more and more for the right to fish, because undercharging might lead to overfishing.[59] One way to make charges more palatable might be to use the payments for a re-stocking fund or for some other conservation measures.[60] In addition, even though fishing rights may cost more and more, one advantage of the PROP strategy is that it does not bind individual fisherfolk to any particular fishing technology. They can decide for themselves what equipment to use, and the system gives them an incentive to find the cheapest and most effective way to extract the fish—or to get whatever other pleasures that fishing brings them. And that is, of course, the basic idea behind the introduction of an individualized property scheme of resource use: At some level of pressure on the fishery, a full-fledged property regime is the cheapest management strategy.

Many of us who teach property law think that all these control strategies represent different kinds of property regimes, but conventional usage only calls the individualized right a property right. Be that as it may, Figure 8 represents how the various control strategies look when one puts them all on the same chart.

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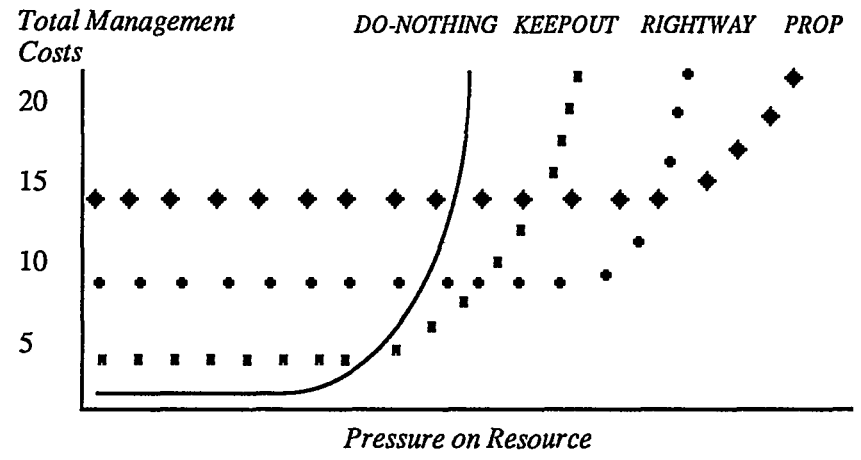
wildlife are inexhaustible. *See, e.g.,* Brightman, *Conservation and Resource Depletion: The Case of the Boreal Forest Algonquians,* in THE QUESTION OF THE COMMONS, *supra* note 12, at 121, 130-32 (noting belief among 18th century Cree that wildlife unaffected by hunting). Brightman pointed out that this belief may change with the perception of wildlife depletion. *See id.* at 138 (indiscriminate hunting now equated with disrespect for animals).

59. *See supra* note 44.

60. *See supra* note 45. For example, Ackerman and Stewart have suggested that property-based emission permits could fund the environmental management agency. Ackerman & Stewart, *supra* note 29, at 1343-44. This technique has been used for years under the "Duck Stamp" program, whereby duck hunters' fees are used to replenish habitat. *See* Coggins & Ward, *The Law of Wildlife Management on the Federal Public Lands,* 60 OR. L. REV. 59, 96 (1981) (describing migratory bird habitat purchased through Migratory Bird Hunting Stamp Act, 16 U.S.C. §§ 715-715s (1988)).

Figure 8: STRATEGY COMPARISON



If this admittedly stylized version of the various management strategies bears any relation to reality, it is pretty clear that the "best" control strategy depends on something else: It depends on how far we have travelled along the horizontal line of resource pressure. These sketched-in figures are "made up," of course, but historically, we have actually observed something like this progression from one strategy to the next as our common resources have come under increasing pressure.

VI. THE EXAMPLE OF AIR POLLUTION

Our efforts to control air pollution exemplify the progression of commons management strategies. When air seemed inexhaustible, our management regime was the DO-NOTHING strategy of "anything goes," an attitude that probably continued longer than it should have. Consistent with the DO-NOTHING strategy, we acted as if automobiles and factories were effectively *entitled* to pollute the air; we thought we had to leave them alone—or perhaps pay them to stop.[61] But greater pressure on air resources ultimately seemed to change our minds about both our own DO-NOTHING strategy and our attendant attitude that

61. For autos, see J. KRIER & E. URSIN, POLLUTION AND POLICY: A CASE ESSAY ON CALIFORNIA AND FEDERAL EXPERIENCE WITH MOTOR VEHICLE AIR POLLUTION 1940-1975, at 98-99 (1977) (California's regulators initially thought they could not act against auto pollution until control device was available); *id.* at 257-63 (general pattern in which no action taken until harms are certain). For factories, see A.G. PIGOU, THE ECONOMICS OF WELFARE 184 (4th ed. 1932) (noting that factory emissions damage neighborhood, but discussing pollution control devices as if they confer benefit on neighborhood, presumably a "benefit" because factories were seen as having basic entitlement to pollute).

polluters were entitled to pollute. Among the first signs of this changed attitude was a shift to the second strategy, KEEPOUT, in the form of land use controls that were designed to allay air pollution. The famous *Slaughter-House Cases*[62] provide an example. Even though most legal academics dwell on the civil rights issues in *Slaughter-House*,[63] those cases also illustrate a KEEPOUT strategy to control unwanted demands on air resources: The cases arose from Louisiana's limitation of New Orleans slaughterhouses to certain locations and the exclusion of all other newcomers.

We saw an early efflorescence of the third strategy, RIGHTWAY, in the later 19th and early 20th centuries, when a number of nuisance suits attempted to control the manner in which factories and other polluters used the air. The basic claim was that the offending factories used the air in a manner that went beyond "reasonable use"; the standard for "reasonable use" was that of the customary and normal uses in the surrounding area.[64] Automobiles added new pressures on our air resources, and after a period of doing rather little about the problem, our early air pollution control laws, including the Clean Air Act,[65] substantially extended the RIGHTWAY approach of nuisance law, particularly in the form of technology-based controls.[66] Modern statutes have demanded that polluters use the "best available control technology," which very much intensifies the RIGHTWAY message of nuisance law by requiring that polluters not simply adopt normal and customary control techniques, but rather perform according to the standards set by the best control devices that technology will allow (with some allowances for cost).[67] These controls also have borrowed from KEEPOUT, insofar as the technology re-

62. 83 U.S. 36 (1872).

63. *See, e.g.*, L. TRIBE, AMERICAN CONSTITUTIONAL LAW § 7-2, at 550-51 (2d ed. 1988).

64. *See, e.g.*, Bove v. Donner-Hanna Coke Corp., 236 A.D. 37, 258 N.Y.S. 229 (N.Y. App. Div. 1932) (denying nuisance claim where smoke and fumes were not out of the ordinary for the area).

65. 42 U.S.C.A. §§ 7401-7671q (West 1983 & Supp. 1991).

66. *See* Bonine, *The Evolution of 'Technology-Forcing' in the Clean Air Act*, 6 Env't Reptr., Monograph No. 13 (1975).

67. *See* Clean Air Act, § 111(a)(1) 42 U.S.C. § 7411(a) (1988) (amended by the Clean Air Act Amendments of 1990, Pub. L. 101-549, § 108) (emission standards for new stationary sources). Prior to the 1990 Amendments, these standards were explicitly based on best available "technological system of continuous emission reduction." The new statutory language eliminates the word "technological" and refers to "the best system of emission reduction." *See* 42 U.S.C. § 7411 (West Supp. 1991). This suggests Congress' current willingness to experiment with systems more akin to PROP, and may permit polluters a choice of non-technological control systems, or the averaging of pollution emissions rather than continuous controls. *See infra* text accompanying notes 69-71. On the other hand, technology-based standards remain the norm for mobile sources. *See, e.g., id.* § 202(a)(3), 42 U.S.C.A. § 7521(a)(3) (West Supp. 1991) (emissions of heavy-duty vehicles based on technology unless otherwise provided); *id.* § 202 (i)(2)(A) & (B), 42 U.S.C.A. § 7521(i)(2)(A) & (B) (future light-duty vehicle emission reductions to be based on availability of technology).

quirements have applied especially forcefully to *new* sources of pollution—new cars, new factories, etc.—while treating old polluters more gently.

We are currently in the midst of a partial transition from RIGHTWAY to PROP in our thinking about air pollution. The reason for this transition is that the costs of these RIGHTWAY technology requirements have grown very high—a matter that is frequently pointed out by proponents of the fourth strategy, PROP. Take, for example, the scrubbers that have been required for new factories or the catalytic converters required for new cars. This kind of regulation has high system costs, because it is expensive and time-consuming to figure out which technology is the "best available."[68] Perhaps even higher are the user costs, because every new factory and auto model has had to employ these technology-based controls—even though controls might be cheaper for some factories or autos than others, and even though it might be cheaper to clean up the air by getting rid of older heavily polluting sources and by allowing averaging-out of pollution among car models and factories.[69]

For these reasons, a number of academic critics argue that we should adopt a PROP strategy, not only for air pollution but for other environmental resources as well. On this reasoning, we should set total pollution limits at acceptable MAXLEVELS—roughly speaking, the point where our intolerance for health and aesthetic damage outweighs the benefits we get from pollution-generators such as cars and factories—and then define and auction off individual "chunks" of pollution up to those limits.[70] These pollution rights would be expensive, and they will increase in price as pressure on the air resources rises. As the price rises, some polluters may simply have to cease their polluting activities, and other polluters may have an incentive to find better and cheaper ways to hold their pollution at low levels. An entitlements system also would spare administrators the expense of defining, prescribing, and monitoring a rigid "best available technology" system.

68. One gets a sense of this expense from some of the cases. *See, e.g.*, Sierra Club v. Costle, 657 F.2d 298 (D.C. Cir. 1981) (concerning technology standards for new stationary pollution sources); International Harvester Co. v. Ruckelshaus, 478 F.2d 615 (D.C. Cir. 1973) (concerning technology standards for motor vehicles). The litigation about standards, of course, adds to the system costs of this control strategy.

69. *See* Dudek & Palmisano, *supra* note 29, at 233 (costs savings of averaging or "netting"); *cf.* Hahn & Hester, *Where Did All the Markets Go? An Analysis of EPA's Emissions Trading Program*, 6 YALE J. ON REG. 109 (1989) (criticizing existing "netting" programs, attributing part of problem to uncertainty of entitlements).

70. *See generally Law and Economics Symposium: New Directions in Environmental Policy*, 13 COLUM. J. ENVTL. L. 153 (1988).

The PROP-based pollution rights approach has now become quite *à la mode*, and it plays an increasing role in our environmental law. Under some circumstances, polluting plants have been able to make in-kind barter bids and trades of pollution rights: They have been permitted to emit additional air pollutants if they could clean up an equal or greater amount of pollution from other parts of their plants, or even from other pollution-creating facilities such as old dry cleaning establishments and bakeries.[71] Some of the new Clean Air Act amendments continue to move in the direction of PROP; in its acid rain control provisions, the new Act permits especially efficient pollution controllers to "bank" their excess cleanup, and "sell" cleanup credits to less efficiently-controlled polluting plants.[72] The idea of these entitlements and trades, of course, is to get greater air cleanup at lower cost by permitting the least-cost controller to capitalize on its talents.

Taken as a whole, then, the history of our air pollution control outlines the progression of control strategies—even though, to be sure, there has been considerable inertia in shifting from strategy to strategy, and much room for mixed strategies.[73] Indeed, our current air pollution law is particularly interesting because it does exemplify a mix of strategies. The technological requirements are RIGHTWAY. But the ambient standards, which set limits on total pollution from certain pollutants, are analogous to a large-scale PROP system, allocating ambient totals to the states, which in turn have devised their own mix of strategies for distributing the allotments among their resident polluters. Tradeable air pollution entitlements represent a more direct PROP strategy, and the prospect of their introduction sharply focuses the controversy about whether the RIGHTWAY strategy or the PROP strategy is preferable.

The current counterattack on PROP, by proponents of the RIGHTWAY technological controls, centers largely on issues that are predictable from this Article's model. These issues concern comparative costs—that is, system costs, user costs, and overuse or failure costs. Probably the most important criticism entails an issue of system costs

71. *See, e.g.*, Chevron U.S.A., Inc. v. NRDC, 467 U.S. 837 (1984) (permitting EPA's "bubble" policy for individual plants); Environmental Protection Agency Emissions Trading Policy Statement; General Principles for Creation, Banking, and Use of Emission Reduction Credits, 51 Fed. Reg. 43814 (1986) (describing emissions trading and other "offset" and "banking" possibilities). The Clean Air Act Amendments of 1990 explicitly contemplate trade in emissions allowances among coal-burning utilities. *See supra* note 30.

72. *See supra* note 30; *see also* Clean Air Act, § 404(b), 42 U.S.C.A. § 7651c (b) (West Supp. 1991) (providing for "substitutions" by which emissions allowances may be transferred).

73. Recent psychological literature suggests that regulatory inertia may stem from a tendency to overvalue the status quo, and undervalue the benefits of change. *See* Noll & Krier, *Some Implications of Cognitive Psychology for Risk Regulation*, 19 J. LEGAL STUD. 747 (1990). For mixed strategies, *see supra* text accompanying note 30.

that may spill over into overuse/failure costs. Proponents of RIGHTWAY technology controls argue that administrators have difficulties in taking the first step toward PROP, that is, finding and setting tolerable maximum levels for many pollutants. This is especially difficult when the pollutant is one of the numerous highly toxic materials that may be damaging even at very low but now unknown levels, substances for which our tests are crude. If we wait until we have done all the testing and collected all the information about our acceptable thresholds, we may effectively do nothing for a very long time; and in the meantime we may suffer grievous consequences.[74] Thus, to use this Article's terms, the high system costs spill over into failure/overuse costs. RIGHTWAY technology controls, on the other hand, avoid the problem of setting levels explicitly; they just say to polluters, "Do the best that technology allows." Technology controls arguably provide protection even when we aren't really sure what level hurts us.

RIGHTWAY proponents also have another critique of PROP's administrative or system costs—a critique that stresses the comparative costs of downstream policing. If we impose RIGHTWAY controls, the argument goes, our downstream policing costs are relatively cheap, because all we have to do is look to see if the required technology—the scrubber or whatever—is in place and in working order. But if we start handing out pollution rights, as we would under PROP systems, how do we know that the recipient is not cheating? We would have to test ambient levels of air or water, and those tests are difficult, expensive, and error-prone. It is a lot easier, it seems, just to check to see whether the factory in question has all its scrubbers in place—that is, whether the factory is using the air in a prescribed RIGHTWAY.[75]

This Article's model suggests that the solution to the relative-cost controversy depends on how congested our air really is. If we are far enough out on the horizontal line of resource pressure, then PROP may be preferable because at that pressure level it minimizes total costs, despite its arguably higher system-wide costs of organization and policing. The PROP strategy is likely to bring savings in the technology costs of individual air users, and most important, if we make the necessary monitoring effort, then PROP should have lower failure or overuse costs for

74. *See* Latin, *Good Science, Bad Regulation, and Toxic Risk Assessment,* 5 YALE J. ON REG. 89, 126-28 (1988).

75. *See, e.g.,* Note, *Technology-Based Emission and Effluent Standards and the Achievement of Ambient Environmental Objectives,* 91 YALE L.J. 792, 808-09 (1982) (noting that technology requirements are relatively easy to monitor, although they often fall short of overall goals of pollution control); *see also* Stewart, *Controlling Environmental Risks Through Economic Incentives,* 13 COLUM. J. ENVTL. L. 153, 166 (1988) (noting need to improve monitoring whichever system is used).

air resources. This occurs because all air pollution would be explicitly limited, "propertized," and paid for, and because users now would have an incentive to minimize pollution. All those lower costs may mean that PROP is a lower-cost total package—*at least where there is high pressure on resources*. The RIGHTWAY strategy, although arguably cheaper administratively (a hotly contested point, of course), still has high technological user costs, and may have especially high failure or overuse costs, because it could leave a lot of uncontrolled pollution in the air. We have to consider that it is the reduction of *total* costs that we are after; and when our available air resources come under a sufficient pressure, PROP's total costs may be less than RIGHTWAY's.

VII. HIDDEN COSTS

The arguments for PROP are very powerful in many areas of environmental law, perhaps because our demands on these congestible environmental resources grow ever higher. But there is a subtle problem with PROP, one that has not been sufficiently addressed by the proponents of this strategy. This problem has to do with a normative component of environmental law that tends to be overlooked by PROP proponents. This normative component surfaces in the form of a fairly commonplace complaint about PROP. The complaint is that PROP systems permit some people to pollute if they pay enough, whereas in principle, everyone should be doing all he can not to pollute. The argument seems to have a certain intuitive force, and it tends to be made by, among others, public interest groups who prefer technology-based RIGHTWAY approaches.[76]

A related complaint appears implicitly in the RIGHTWAY criticisms of PROP systems: One reason for RIGHTWAY's attack on PROP may have to do not so much with total costs as with the *distribution* of costs. RIGHTWAY's command-and-control approach saddles individual air polluters with the major abatement costs by requiring the use of technological pollution control devices. PROP, on the other hand, with its higher downstream monitoring and policing costs, seems to have proportionately higher administrative or system costs—and those higher system costs seem to mean that PROP allocates a greater proportion of pollution control costs to the public, and rather less to the polluter.

Now, there is no reason why, under a PROP regime, the proceeds of pollution fees or permits could not be cycled back to pay the higher costs

76. *See* M. SAGOFF, *supra* note 2, at 209 (1988) (environmentalists' objection to tradeable pollution rights); *see also id.* at 84 (describing popular resistance to concept of pollution "rights").

of policing that PROP requires.[77] But at least at first blush, RIGHTWAY seems to locate abatement costs more directly on the polluter, and to some, that undoubtedly seems the fair and just approach. And in general, RIGHTWAY strategies seem to carry a rhetoric of responsibility—a principle that everyone should be doing her best *not* to pollute.

This rhetorical issue calls for a return to our earlier list of available control strategies. There is one control strategy that I deliberately neglected earlier, but that I wish to bring up now. That strategy is moral suasion or exhortation. In its crudest form, exhortation appeals to the goodwill and sense of common duty of the citizenry; exhortative control strategies ask the citizens to refrain from overuse of the air, the water, the land and its growing things. Exhortative strategies appeal to the citizenry to recycle bottles and paper, to drive autos less and to walk more, to use roll-on deodorants instead of aerosols.

Now, a number of commentators on environmental matters regard exhortation as something that brings few results; exhortation, on this view, is another version of the most primitive first strategy, that is, DO-NOTHING. According to William Ophuls, for example, exhortative appeals will accomplish little in the vast n-person prisoners' dilemma of environmental problems. Instead, what is required is some version of Hobbesian coercion.[78]

Is this true? My colleague Robert Ellickson has critiqued this skeptical outlook by pointing to a number of property regimes that are informal and essentially voluntary and draw little or no support from coercive legal systems. Indeed, these regimes—which may be quite contrary to the formal law—are founded on principles of neighborliness.[79] We have all seen countless examples of such regimes, and they are by no means confined to relations with acquaintances or neighbors, from whom we might expect reciprocal benefits: We stand in line at the movies, we respect other people's placemarkings (books, coats) at library tables, we hand change back to the cashier who has undercharged us.[80]

77. *See* Ackerman & Stewart, *supra* note 29, at 1343 (suggesting that we fund environmental agencies through sale of pollution permits).

78. W. OPHULS, *supra* note 3, at 153-56 (1977).

79. Ellickson, *Of Coase and Cattle: Dispute Resolution Among Neighbors in Shasta County*, 38 STAN. L. REV. 623, 672-77 (1986). *See also* the critique of E. OSTROM, *supra* note 12, at 13-15 (criticizing argument that coercive systems are the "only way" to solve environmental problems).

80. For the historic expectation of citizens' good behavior in the management of public goods, see Rose, *The Comedy of the Commons: Custom, Commerce, and Inherently Public Property*, 53 U. CHI. L. REV. 711, 745-46 (1986) (providing examples of expected good behavior in use of roads and waterways in 19th century).

Given the prevalence of this type of behavior—sometimes at considerable cost to the persons involved, and with no hope of recompense—it may not seem so laughable to think that people may be swayed by their perceptions of what they think is the right thing to do. Not too long ago, for example, Minnesota state park officials reintroduced moose into the North Woods. When asked whether they feared that people would harass and hunt the animals, the officials offered the opinion that the populace was so excited about the moose that no one would pester or kill them.[81] Now this may be wishful thinking, since it does not take many bad apples to ruin a program of this sort.[82] But it does not seem altogether implausible, either, that the citizenry would try to do the right thing even in such a fragile experiment.

Indeed, a whole body of literature is emerging that stresses the importance of norms that structure human behavior in prisoners' dilemma-type situations—precisely when one would most expect noncooperation.[83] For our purposes, the point is that if we do have a good deal of voluntary cooperative behavior, even in n-person prisoners' dilemmas, then it may not be entirely foolish to think that the norms that induce this behavior can be of some considerable importance in our regimes for protecting the environment.

That is the first point about exhortation or moral suasion: It may affect norms and norms affect behavior. A second point is that we cannot consider exhortation in isolation; we have to compare exhortation to the coercive systems that some seem to think necessary. Coercive systems are not cheap. As this Article has pointed out, even though some coercive systems are more expensive than others, all involve some version of rules, police, and related administrative apparatus, and all are costly, whether they are imposed by the state or by some private or customary groups. By comparison, exhortation or moral suasion is cheap.[84] If we

81. *Moose Free to Roam in their New Home,* Chicago Tribune, March 26, 1985, § 1, at 6, col. 1 (public expected to "regulate itself" and not harm animals by poaching); *Despite 5 Moose Deaths, New Herd is Doing Fine,* Chicago Tribune, Jan. 29, 1986, § 4, at 5, col. 1 (deaths attributed to disease rather than to humans).

82. *See* T. SCHELLING, MICROMOTIVES AND MACROBEHAVIOR 131 (1978). Schelling noted that one instance of noncooperation may ruin a whole system in some situations, e.g., litter or a noisy lawnmower, although other cooperative systems may tolerate some mix of uncooperative behavior before collapsing.

83. *See, e.g., Symposium on Norms in Moral and Social Theory,* 100 ETHICS 725 (1990); E. ULLMAN-MARGALIT, *supra* note 9.

84. This may particularly be the case insofar as people enjoy advising others or "punishing" non-cooperators by gossip, admonition, etc. *See* R. ELLICKSON, *supra* note 12, at 57-59. The informal "mayor" of the neighborhood street (or even the town busybody) may play a role in norms that bears some relation to the role of the political entrepreneur, upon whom we depend for political organization. For a discussion of political entrepreneurs, see *supra* text accompanying note 11.

are thinking about effectiveness-per-dollar, then moral suasion might not look so bad.

Even if we were to agree, for the sake of argument, that exhortation has an effectiveness level of next-to-nothing as a control strategy, next-to-nothing might be all we need in some instances. At relatively low levels of pressure on a given resource—when we are still just a small step past our congestion point, and when competing users have noticed the problem but have not yet become thoroughly vexed with one another—moral suasion might, indeed, be the most cost-effective means of restraining overuse of a resource. Thus, even on the most pessimistic view—that is, that exhortation might not do much—talk is still cheap; when not much needs to be done, exhortation might be our best bet.

However, even the pessimists may need more moral suasion than they think. That brings me to a third point, one that goes back to a problem posed earlier in this Article: Suppose a group of common resource users (fishers, or air users, or whatever) realize that they need a management system—how do they ever get themselves together on a common scheme? Even if the best scheme would be a coercive one, how does a group get together to select the appropriate Leviathan and invite her to take over? Government or management systems are "commonses" too, and if citizens cannot agree on their respective use of the resource, how can they agree on its management system?[85] Instead of creating a management system, why do they not squabble and jockey and shirk and hold out and, putting it generally, undertake all those behaviors that are so often predicted for the prisoners' dilemma?

What they are going to need is some version of moral suasion to induce them to trust one another and to undertake their respective shares of a management system. I have argued elsewhere that storytelling or narratives are especially important in creating a social and moral community in which the participants can exercise some measure of self-restraint because they trust one another to reciprocate.[86] These may be stories of a common past and of a history over time—the stories that often arise in constitutional discussion.[87] In the environmental context, on the other hand, the stories are most likely to paint a picture of lost or threatened purity, of a world that is moving toward an intensely horrible future—unless, of course, we change our evil ways.[88] But whatever di-

85. *See supra* text accompanying note 10.

86. Rose, *Property as Storytelling: Perspectives from Game Theory, Narrative Theory, Feminist Theory*, 2 YALE J.L. & HUMANITIES 37 (1990).

87. *See* Alexander, *Takings, Narratives, and Power*, 88 COLUM. L. REV. 1752 (1988).

88. The so-called Greenhouse Effect—global warming due to production of carbon-dioxide—is an example. *See, e.g.*, Stevens, *Earlier Harm Seen in Global Warming*, N.Y. Times, Oct. 17, 1990, at

rections they take, narratives are a way of bridging gaps, creating a community and persuading the members of that community to take certain steps in common.

And so, although it is unquestionably the case that hard-nosed approaches to environmental problems can be useful and illuminating, their proponents' contempt for moral suasion is somewhat unrealistic. This contempt for the efficacy of moral suasion is perhaps premised on a view that discounts the role of voluntary cooperation. But complete noncooperation will cause any management scheme—including a property regime—to collapse before it even begins. Even the most hard-nosed property-rights systems may depend on something like education or moral suasion to convince everyone to respect the property of others.[89]

This brings me back to the RIGHTWAY proponents' criticism of the PROP strategy. Exhortation or moral suasion is a hidden rhetorical component in all the control strategies, but the various strategies differ rather substantially with respect to their educational or hortatory thrust. I will leave to one side the KEEPOUT strategy of exclusion of new uses, except to note that it carries a moral message of self-protectiveness, as has been noted of the exclusionary zoning techniques in land use (some of which may look like environmental protection)[90] or in the so-called NIMBY syndrome that increasingly plagues the placement of locally-unwanted land uses.[91] Sometimes there may be important distributional or cultural reasons for these seemingly self-interested arrangements—as for example in the case of the protection of resources for indigenous peoples[92]—but aside from these specialized circumstances, the control strategy that keeps out newcomers is not normally telling narratives of generosity, understanding, and helpfulness, at least with respect to the world at large—though of course it may be doing so with respect to insiders.[93]

A9, col. 1 (report of international science panel, described as worst-case scenarios by one commentator).

89. *See* Rose, *supra* note 86, at 52-53. *See also* E. OSTROM, *supra* note 12, at 15 (competitive market is a public good).

90. For an account of exclusionary zoning, see, e.g., McDougall, *From Litigation to Legislation in Exclusionary Zoning,* 22 HARV. C.R.-C.L. L. REV. 623 (1987); for the relationship of exclusionary zoning to environmentalism, see, e.g., Foderaro, *Affordable Housing Issue Ruffles Idyllic Westchester,* N.Y. Times, Jan. 29, 1990, at B1, col. 2 (environmental justifications for community's lack of low income housing sites).

91. NIMBY stands for "not in my back yard." *See, e.g.,* Brion, *An Essay on LULU, NIMBY, and the Problem of Distributive Justice,* 15 B.C. ENVTL. AFF. L. REV. 437 (1988) (tracing the roots of the NIMBY movement).

92. *See, e.g.,* Schmidt, *Wisconsin Spring: New Fishing Season, Old Strife,* N.Y. Times, Apr. 8, 1990, at A20, col. 1 (Chippewa Indians' exclusive early fishing rights antagonizes sportfishers).

93. For an economic critique of the KEEPOUT strategy's usual favoritism of old uses, see Huber, *Safety and the Second Best: The Hazards of Public Risk Management in the Courts,* 85

The RIGHTWAY and PROP strategies also carry moral messages, but those messages differ. RIGHTWAY, focusing on the way resources are used, carries the message that at a minimum, one should use congestible common resources in a "reasonable" way, and one should respect one's neighbor's rights. That is the gist of the older nuisance law, an early RIGHTWAY regime. The more recent versions, best observed in technology-based approaches to environmental protection, raise the moral ante: They tell each would-be polluter that she must do her best, and they do something to create a larger culture in which the expectation is that everyone must do his best.

There are some problems with RIGHTWAY's normative message—especially in its current incarnations—and I will return to those problems shortly. But the general difference in moral tone, I think, is the basis of the RIGHTWAY proponents' most fervent attack on PROP: PROP loses RIGHTWAY's moral thrust by surrounding pollution with rights-talk, by using a rhetoric of entitlement to pollute. When we reconceptualize the use of common resources as individual property rights, we attenuate the moral rhetoric of contribution and trying harder for the common good. This attenuation occurs even though economic incentives may persuade would-be polluters, on self-interested grounds, that they indeed should try harder.

One may be extremely sympathetic to PROP's entitlement/market approach, especially at high levels of pressure on common resources. The arguments in favor of this strategy are extremely powerful and become ever more so as our common resources are ever more strained. But it may be well to consider that the adoption of the sophisticated PROP techniques, without attention to their rhetorical message, may come at the price of a diminution in a certain element of moral suasion. In turn, this moral diminution may work against the overall effectiveness of PROP by creating a cultural climate in which one is not expected to do the right thing unless it is in one's direct interest to do so.

When we compare the RIGHTWAY and PROP strategies—the chief competitors in our current environmental debate—we might want to take this differing moral component into account. I am not saying that RIGHTWAY should automatically prevail, particularly in some of its current incarnations in our environmental law, but only that it has one larger hortatory advantage—and PROP a hortatory disadvantage—that should be factored into our calculations. The larger point is that a PROP regime has to prove itself on a normative battleground, as well.

COLUM. L. REV. 277, 295-99 (1985) (new risks should not be disfavored; technological improvements in products and processes have proven to be less hazardous than the old versions).

To date PROP's proponents have not taken up the normative argument, perhaps because of PROP's association with the exuberant celebration of self-interest often found in law-and-economics literature.

This is of course not the end of the story. In some areas, our laws have been gradually moving toward PROP regimes, and one reason may be that the normative balance between RIGHTWAY and PROP does not so unambiguously favor RIGHTWAY as once seemed to be the case. There may well be a self-defeating element of cant or hypocrisy in some of our current versions of RIGHTWAY. This may be especially true insofar as this strategy is combined with KEEPOUT's ungenerous and perhaps retrograde favoritism to older uses, and insofar as RIGHTWAY's "best available technology" requirements may be manipulated to add to the burdens on enterprises that already have been doing their best, while allowing lesser efforts of competitors who have never tried so hard at all.[94]

Perhaps most important, RIGHTWAY's overload of technical controls may seem less normatively defensible as these controls have grown more expensive and arguably less effective. If there truly are cheaper ways to avoid pollution, then uniform RIGHTWAY controls look more and more like efforts to achieve something different from pollution control. Indeed, these controls often look like an effort to aid certain enterprises, such as suppliers of polluting fuels or products, where sales would drop away unless the purchasers were forced to clean up through RIGHTWAY controls. Maintaining such enterprises comes at the expense of the industries who have to install RIGHTWAY controls, and of their customers who must pay much more in service of these unspoken distributional goals.[95] It is at such junctures that RIGHTWAY looks less like "do your best," and more like pious homilies and hypocrisy, in service of private interests rather than common ones.

Yet the other side of the balance, the normative acceptability of PROP in the context of environmentalism, still needs to be addressed. It is not that PROP has no normative force, but rather that this force usually appears in PROP's protection of some individual *good* things—one's home, one's castle, one's privacy—things that PROP protects against

94. *See* International Harvester Co. v. Ruckelshaus, 478 F.2d 615, 637 (D.C. Cir. 1973) (discussing ways in which enforcement or suspension of technology standards might hurt manufacturers that had already made greatest effort). For a more recent example, see Templin, *Fuel-Economy Law that would Stymie Japanese is Sought by U.S. Auto Makers,* Wall St. J., Dec. 5, 1989, at A11, col. 1 (discussing percent-reduction plan for automotive fuel-economy measures; such a plan would hurt Japanese auto manufacturers because their fuel economy is already superior to that of other manufacturers).

95. *See, e.g.,* Ackerman & Hassler, *supra* note 32, at 1496-97 (technology requirements in 1977 Clean Air Act aimed at aiding some interests at expense of others).

heedless marauders or overweening officials.[96] PROP's normative side is harder to see when the subject of the property right is something like pollution, which we commonly think an evil, even if it is sometimes a necessary one. In contexts in which PROP protects an evil, we merely tolerate schemes of entitlements, even though they grate. And sometimes we may not even tolerate these schemes: Shylock never did get his pound of flesh.

Are there ways—in the environmental context of entitlements to take and use common goods—that PROP might carry a message as something other than simply a set of rights to do evil? One way, of course, is to focus on the point that property rights are costly, and that paying the costs discourages wasteful attitudes: A PROP regime encourages resource users to be thrifty, to take only what they need, and no more.

Some other rhetorical routes, though, might be built into the legislation that we adopt about environmental PROP regimes. As a simple matter, we might designate pollution entitlements negatively, not as "rights" but rather as "emission debits" or "penalties." As a more complex matter, we might consider the rhetorical advantages of taxing or charging for pollution—either of which suggests that pollution is not so much a right as a tolerated evil—rather than giving away or selling pollution permits, although to be sure, the rhetorical advantages might be outweighed by some other considerations.[97] Yet a third measure concerns the recycling of funds taken from the allocation of pollution entitlements; if these funds can be directed to environmental monitoring, or to other positive environmental projects, then a PROP system can be characterized as contributing as much to our common resources as it takes from them. The point of all these devices is rhetorical: We need to pay attention to the lessons we provide for ourselves through our laws.

CONCLUSION

Summing up, then, this Article makes a number of points about the ways that we might manage the environment. The first point is that environmental goods often are not only common goods but are congestible goods, in the sense that they may be used by a number of people before their congestion becomes uncomfortable. Second, at some level of use,

96. For a well-known application of this protective aspect of property, see Reich, *The New Property*, 73 YALE L.J. 733 (1964) (extension of property rights to participation in governmental programs).

97. *See* Stewart, *supra* note 75, at 163 (noting advantage of permit system in avoiding price-setting problems of charges), *cf.* Rose-Ackerman, *Market Models for Water Pollution Control: Their Strengths and Weaknesses*, 25 PUB. POL'Y 383, 387-89 (1977) (detailing difficulties which arise by attempts to legislate markets into being).

increasing usage does become uncomfortable, and it is at that point that we may begin to think about management strategies for environmental goods. Third, we can categorize several different management strategies for such goods—strategies that have different cost structures, so that there is no absolute "best" strategy. Instead (and fourth), the choice of the best strategy, in the sense of the least-total-cost, depends on what I have called the level of "pressure" on the resource.

There are numerous implications of this series of points, not all of which I can pursue here, but some of which follow.

1. *Environmental Resource Valuation.* A first implication is that by paying attention to the relative costs of resource management strategies, we learn something about the reason why environmental resources are so difficult to value. It is widely recognized that environmental goods are difficult to price because we have no conventional market for them;[98] but the reason we have no market for environmental resources is that environmental management regimes are so difficult and costly to install. Management of "commons" resources is always expensive and grows ever more expensive as we move from the least to the most sophisticated management strategies. Thus it may not be worth the effort to adopt a management system for some given commons resource—especially not a sophisticated PROP system. This in turn means that there is no easy and conventional way to price the resource, since pricing entails some sort of PROP definition of the priced entitlement. But this does *not* mean that the resource is valueless—far from it. What we need to realize is that our difficulties in pricing the resource stems not from the resource's lack of value, but rather from the costliness of a property regime that might be used to manage it, and that might derivatively give us an easy (market) way to price it. Thus the problem of valuation—a major issue in environmental law[99]—stems from the same root causes as many other issues in environmental law, namely the expense and difficultly of establishing management regimes for common resources.

2. *Selection of Resource Use Levels.* This Article has deliberately put to one side the issue of setting of ambient levels of resources, or as I have put it, setting a MAXLEVEL that allows a resource to be used but also to regenerate at levels where we get the most value from it.[100] I have been assuming a fixed MAXLEVEL, so as to simplify the analysis of

98. *See* M. SAGOFF, *supra* note 2, at 74-98 (skeptical view of pricing substitutes).

99. *See, e.g.,* Ohio v. Department of the Interior, 880 F.2d 432 (D.C. Cir. 1989) (valuation of natural resource damage in cleanup legislation); Anderson, *Natural Resource Damages, Superfund, and the Courts,* 16 B.C. ENVTL. AFF. L. REV. 405, 450-52 (1989) (same).

100. *See supra* text accompanying notes 18 & 41.

management costs. Nevertheless, the differing cost structures of different management strategies clearly bears on our choice of those overall MAXLEVELS; just as cheaper technology for resource exploitation might increase the pressure on the resource, so does a cheaper control method make it more feasible to reduce that pressure.[101] Thus, for example, if more and more people are out to get some resource, a high level of protection might not be worth the cost if we were to stick with, say, KEEPOUT—the costs of defending against outsiders might eat up all the gains. But it might be worth the cost if we were to switch strategies to the more sophisticated RIGHTWAY (or perhaps PROP), because at some levels of resource pressure, those more complex strategies are cheaper, despite their complexity. Thus, management costs figure back into the choice of ambient or MAXLEVELS; we need to keep an open mind about the possibility of switching strategies when we figure out how protective our environmental laws should be. Even if we have been spending a lot on KEEPOUT (or RIGHTWAY) strategies to protect a resource at some given level, we might nevertheless be able to afford greater protection if we shifted to a PROP strategy.

3. *Norm-formation and Environmental Management.* By far the most important implication of the evolving pattern of commons management strategies is this: We need to pay more attention to the relatively underdiscussed management strategy of norm-production—that is, moral suasion or exhortation. Our acts and words convey varying messages about what it means to "do the right thing," and in any given culture, those words and messages may affect the way we use common resources. The management strategies outlined here all have some component of norm-production or moral suasion: Each delivers some message about what the right thing to do might be.

For a truly comprehensive evaluation of the different environmental management strategies, then, we need to compare their normative advantages or disadvantages, alongside their other advantages or disadvantages; we need to think about how strategies might be shaped to deliver the norm-creating functions that we need. The point is only a variant of a very old idea, one that goes back at least to Aristotle[102]—that our laws are not just our controllers, but our teachers. For better or worse, normative or hortatory lessons are embedded in our laws, and we need to think about the education they impart when we adopt legal institutions to manage resources for ourselves, our neighbors, and our children.

101. *See supra* text accompanying note 38.

102. ARISTOTLE, *Politics,* 1337a11-b23, in THE BASIC WORKS OF ARISTOTLE (R. McKeon ed. 1941).