

ENCOURAGING CONSERVATION ON PRIVATE LANDS: A BEHAVIORAL ANALYSIS OF FINANCIAL INCENTIVES

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Introduction.....	542
I. The Conundrum of Conservation on Private Land	544
A. Private Landowners and Environmental Impacts.....	545
B. Limitations of Traditional Regulatory Approaches on Private Lands	546
C. Behavior-focused Strategies: The Rise of Conservation Incentives.....	550
1. Direct Payment Programs: Cost-Share Projects, Limited Term Easements, and Leases.....	551
a. Cost-Share Projects.....	552
b. Term Easements and Conservation Leases.....	553
2. Transfers of Partial Property Interests: Permanent Conservation Easements	554
D. Flies in the Ointment: Challenges for Conservation Incentives	556
II. Behavioral Research: How Individuals Respond to Financial Incentives.....	558
A. An Introduction to Behavioral Learning Theory.....	558
B. Research on Monetary Incentives for Pro-environmental Behavior.....	559
1. Incentives Studies: The Challenges of Eliciting Behavioral Curtailed	559
2. Incentive Must Continue Across the Desired Temporal Span of Behavior	562
3. Crowding Out of Intrinsic Motivation	564
III. Applying Behavioral Science to Conservation: Proposals for Increasing the Efficacy of Financial Incentives	567
A. Intermittent Reinforcement to Maintain Behavior	567
1. Staggering Compensation for Direct Payment Programs	568
2. Ongoing Reinforcement for Conservation Easements.....	571
B. Safeguarding Intrinsic Motivation: Restructuring Compensation and	

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Administration	574
1. Rightsizing Excessive Financial Incentives.....	575
2. The Importance of Framing Feedback to Emphasize Achievement and Autonomy	578
C. Social Marketing: Increasing Participation	580
Conclusion	582

INTRODUCTION

A homeowner decides to cut down an acre of woods and fill in part of a wetland in order to build guest cottages around his property for visiting family members. A rancher mismanages vegetation and brush and as a result soil sediment from erosion pollutes a nearby watershed. A retiree subdivides a 50-acre woodland property containing rare species of grass and birds and sells it off as building lots. These everyday actions illustrate the growing problem of destruction of habitat, reduction in biodiversity, loss of open space, and environmental degradation caused by private landowners.

The question of how to reduce environmental impacts and promote science-based management on private lands is front and center in the environmental policy debate. Legislation and regulation have proven to be an incomplete solution. The large numbers and geographic dispersion of private landowners, as well as the concealed nature of activities on these lands, make proscriptive regulation difficult to implement and enforce. Traditional command and control regulation is ill-suited for promoting active and adaptive management practices tailored to individual parcels of land. Moreover, penalizing individuals is expensive, politically unpopular, and creates negative attitudes towards environmental protection. For example, some commentators have argued that the Endangered Species Act has contributed to the proliferation of the wise use movement and private property interest groups.¹

Against this backdrop, both government and non-profit organizations have channeled significant resources towards creating and expanding financial incentives.² Incentives offer a promising method of increasing conservation and stewardship without alienating landowners. Conservation incentives generally take the form of tax deductions and credits, full or partial payment for conservation projects, low-interest loans, or tradable credits.³ Two major types of conservation

1. See, e.g., Christopher S. Elmendorf, *Ideas, Incentives, Gifts, and Governance: Toward Conservation Stewardship of Private Land, in Cultural and Psychological Perspective*, 2003 U. ILL. L. REV. 423, 443 (2003). The wise use movement endorses land use in service of mankind and to promote the economy. The movement supports the commercial use of public lands for mining, timber, and oil and is strongly opposed to any regulation of private land.

2. See generally Defenders of Wildlife, *Incentives for Conservation*, <http://www.biodiversitypartners.org/incentives/index.shtml> (summarizing extensive array of federal and state incentive programs for conservation) (last visited Sept. 28, 2006).

3. Pricing in particular is an extremely powerful behavioral tool because prices reinforce behaviors immediately and continuously. Unfortunately, pricing does not appear

incentives in the United States are direct payment programs for cost-share projects and term easements, such as the Wildlife Habitat Incentives Program and the Conservation Reserve Program,⁴ and permanent conservation easements.⁵ These programs aim to motivate conservation on private lands either in lieu of regulation or as an adjunct to it. In some cases, the incentives are intended as a temporary measure to facilitate a transition to new legal obligations for stewardship. In other situations, the incentives provide an ongoing means of compensating individuals for positive externalities that benefit the broader public, such as expanding or restoring habitat for rare species. When information costs are high, incentives can be more cost-effective than regulation.⁶ The incentives motivate landowners to come forward with information about the ecological value of their land and, ideally, to compete for incentive payments.⁷

Despite the recent surge of enthusiasm for incentive-based approaches to conservation and the rapid proliferation of these programs, there has been scant attention to the psychological research on behavior change and incentive design. Changing behavior requires carefully structured, appropriately sized, and well-timed incentives.⁸ Even with these limitations, however, incentives are more effective at altering behavior than persuasion, education, or other efforts to change attitudes.⁹ There has not been sufficient appreciation of the marked intractability of attitudes and the difficult, slow, and uncertain path to changing them. When attitudes do change, there is no guarantee that people will behave in a consonant manner.¹⁰ Behaviorism offers an intriguing alternative: to focus our initial efforts on changing people's actions rather than their thoughts or values.¹¹

This Article applies research in behavioral learning theory and social psychology, as well as the developing field of environmental psychology, to make two contributions to the legal scholarship. First, the Article discusses empirical research on the ability, and limitations, of financial incentives to motivate pro-environmental behavior change in individuals. Second, it considers the design of conservation incentives in light of this research and suggests ways to improve their efficacy and reduce enforcement costs. Part I discusses the limitations of traditional regulatory approaches to conservation, describes the major conservation incentive tools, and examines the difficulties that hinder incentive-based

to be politically viable in the U.S. with its long history of subsidizing environmentally damaging activities.

4. See *infra* Part I.C.1.

5. See I.R.C. §§ 170(c), (f)(3)(B)(iii), (h) (2000).

6. See James Salzman, *Creating Markets for Ecosystem Services: Notes from the Field*, 80 N.Y.U. L. REV. 870, 921 (2005).

7. *Id.* at 925.

8. See, e.g., RAYMOND S. NICKERSON, *PSYCHOLOGY AND ENVIRONMENTAL CHANGE* 94–95, 99–100 (2003).

9. See *infra* Part II.B.1.

10. See RICHARD D. KATZEV & THEODORE R. JOHNSON, *PROMOTING ENERGY CONSERVATION: AN ANALYSIS OF BEHAVIORAL RESEARCH* 50 (1987).

11. Moreover, eliciting pro-environmental behaviors may be the most efficacious method of attitude change, as research has shown that people modify their attitudes to be more in keeping with their actions. See *generally* LEON FESTINGER, *A THEORY OF COGNITIVE DISSONANCE* (1957).

initiatives. The analysis focuses on individual landowners rather than agricultural corporations because the behavioral learning research is specific to individuals rather than corporate entities (whose behavior is constrained by pressure from stakeholders). Part II turns to the empirical research on monetary incentives and considers the following questions: How effective are incentives at promoting behavioral change? What schedule of reinforcement or timing of rewards is necessary to maintain the behavior over the long-term? Are there circumstances in which incentives can decrease intrinsic motivation (i.e., motivation to act absent an explicit reward)? The insights that emerge from this examination are the moderate impact of incentives on pro-environmental behavior, the importance of continued behavioral reinforcement, and the effect of incentive size and administrative style on intrinsic motivation.

Drawing from the behavioral research, Part III offers proposals for improving incentive tools and programs. First, staggering payments in installments provides ongoing reinforcement and promotes longer-term maintenance of conservation behaviors. Despite research showing that behavior ends upon termination of an incentive, a number of conservation incentive programs offer all or most of the compensation upfront. This frontloaded structure reduces the likelihood that landowners will maintain the behavior over time and increases enforcement costs. Second, reducing excessive payments and emphasizing positive feedback safeguard intrinsic motivation. Those participants who possess intrinsic motivation for a conservation practice prior to receiving an incentive are more likely to retain this motivation if they perceive the incentive as supporting rather than controlling their behavior. Third, increasing the resources devoted to recruitment and the sophistication of marketing strategies amplifies the effectiveness of incentives. The Article concludes by noting the importance of maintaining realistic expectations for incentives. Incentives typically produce moderate, not dramatic, levels of behavioral change and are not immune from the problems of cost, monitoring, and enforcement that affect command and control regulation.

I. THE CONUNDRUM OF CONSERVATION ON PRIVATE LAND

Given the ecological importance of private lands and conflicts over land use policy, the issue of private land stewardship has loomed increasingly large in environmental policymaking. With most regulatory efforts in recent decades focused on corporations, we are just now confronting the costs of reducing impacts from individuals on biodiversity and pollution.¹² Traditional regulation has not provided a complete solution due to the large numbers of private landowners and the hidden nature of their activities. In particular, command and control regulation, standing alone, is not well-suited for the goals of promoting active or adaptive management. In light of these limitations, there has been increasing emphasis on offering financial incentives for conservation, either as independent programs or as supplements to regulatory approaches.

12. See Richard B. Stewart, *A New Generation of Environmental Regulation?*, 29 CAP. U. L. REV. 21, 115 (2001).

A. Private Landowners and Environmental Impacts

More than 60% of land in the United States is privately owned.¹³ In some areas of the country that figure is much higher, with more than 90% of land held privately in certain eastern and midwestern states.¹⁴ As a result, individual landowners play a pivotal role in biodiversity preservation, open-space conservation, and wetlands management. Private lands, especially large, contiguous parcels, contain biologically diverse ecosystems as well as rare, threatened, and endangered species.¹⁵ Three-quarters of all threatened or endangered species depend on private land for habitat, food, or breeding grounds.¹⁶ The majority of wetlands, which filter impurities and provide other ecosystem services, are located on private rather than publicly owned land.¹⁷ Private lands are also integral to efforts to preserve open space threatened by development and urban sprawl.

Private landowners are the source of widespread environmental harms. Residential and agricultural development of land threatens biodiversity by destroying habitat. Farming is a major source of soil erosion and nonpoint pollution.¹⁸ Soil erosion occurs from grazing, farming practices, and inadequate management of vegetation,¹⁹ as well as general residential and commercial development. Nonpoint pollution results from the run-off of chemicals (e.g., pesticides, fertilizers) as well as soil nutrients. This pollution spreads through surface water runoff to contaminate lakes, rivers, oceans, and streams.²⁰

Safeguarding biodiversity requires addressing the divergent interests, backgrounds, and attitudes of private landowners. This Article focuses on private landowners of ecologically valuable or sensitive land, including farmers and ranchers who own their land or who rent with a contract to receive conservation incentive payments, and owners of nature retreats, estates, or vacation homes. Sociological research reveals that farmers and ranchers tend to hold strongly utilitarian attitudes towards nature and attribute significant resource extraction value to land. They are concerned with the productivity and profitability of nature

13. RUBEN N. LUBOWSKI ET AL., U.S. DEP'T OF AGRIC., ECON. INFO. BULLETIN NO. 14, MAJOR USES OF LAND IN THE UNITED STATES 35 (2006), available at <http://www.ers.usda.gov/publications/EIB14/eib14.pdf>.

14. In Illinois, for example, over 90% of land is privately owned. DEFENDERS OF WILDLIFE, SAVING BIODIVERSITY: A STATUS REPORT ON STATE LAWS, POLICIES, AND PROGRAMS, § 2 (1995), <http://www.defenders.org/pb-bst16.html>.

15. See *id.*

16. See *id.*

17. Peter M. Morrisette, *Conservation Easements and the Public Good: Preserving the Environment on Private Lands*, 41 NAT. RESOURCES J. 373, 374 (2001).

18. See J.B. Ruhl, *Farmland Stewardship: Can Ecosystems Stand Any More of It?*, 9 WASH. U. J.L. & POL'Y 1, 11–13 (2002).

19. See S.J. BENNETT & C.V. ALONSO, U.S. DEP'T OF AGRIC., EROSION AND SEDIMENTATION RESEARCH IN THE U.S. DEPARTMENT OF AGRICULTURE, AGRICULTURAL RESEARCH SERVICE (1997), <http://water.usgs.gov/osw/techniques/workshop/s.j.bennett.html>.

20. Nonpoint pollution affects water sources at a distance from the initial pollution discharge. See Ruhl, *supra* note 18, at 4.

as well as with the way of life their working lands provide.²¹ Preserving social relations, family tradition, and independence figure heavily in their calculus of land-use decisionmaking.²² In addition to farmers and ranchers, there are a growing number of recreational users who own primary homes and vacation residences on coastal land, forested acreage, or open ranges. These individuals show a stronger ideological orientation towards appreciating and experiencing, rather than utilizing, land resources.²³ Theirs is often a “nature for nature’s sake” model.

These descriptions are of course generalizations, collected by calculating average responses and attitude valences across groups, but they are nonetheless helpful to the extent they suggest distinct orientations towards land stewardship. As Christopher Elmendorf has argued, this cultural divergence between farmers and ranchers and environmentalists effectively foreshadowed the clash over conservation and environmental regulation.²⁴ Conservation regulation is unpopular with farmers and ranchers when they perceive a threat to their way of life, particularly when that threat comes from environmentalists who do not share their background and social ties.²⁵ The attitudes of landowners are critical to determining which approaches will be most successful and the best way to introduce new programs. The sociological research suggests that farmers and ranchers may react differently to conservation incentives depending on whether they converge with their interest in maintaining the health of working lands. For example, measures such as contour farming (i.e., tilling land across slopes and elevations rather than vertically) that safeguard the long-term viability of agricultural land will receive a more favorable reception than species or habitat protection, which reduces land use and protects animals that farmers view as pests. An appreciation of the cultural and sociological context of landowners is important to determining which policy tools—regulation, incentives, market strategies, or some combination—make sense for addressing specific conservation issues.

B. Limitations of Traditional Regulatory Approaches on Private Lands

The traditional model of command and control regulation is often difficult to square with the challenges of conservation and stewardship on private lands.²⁶ Pure regulatory approaches to conservation have suffered from enforcement

21. See Elmendorf, *supra* note 1, at 443.

22. *Id.*

23. For example, a study of attitudes towards prairie dogs found that members of conservation organizations and urban residents had positive attitudes towards prairie dog preservation while rural residents, particularly ranchers, had antagonistic attitudes towards prairie dogs. Richard P. Reading et al., *Values and Attitudes Toward Prairie Dogs*, 12 ANTHROZOÖS 43, 45 (1999).

24. See Elmendorf, *supra* note 1, at 443.

25. See *id.*

26. But see Daniel H. Cole & Peter Z. Grossman, *When is Command-and-Control Efficient?: Institutions, Technology, and the Comparative Efficiency of Alternative Regulatory Regimes for Environmental Protection*, 1999 WIS. L. REV. 887, 936–37 (1999) (arguing that command and control is not invariably inefficient and that command and control regulations are likely to be at least as efficient as market-based initiatives when abatement costs are low and monitoring costs are high).

difficulties, perverse incentives, failure to advance active management practices, and alienation of landowners.²⁷ The limitations of traditional regulation suggest that in certain circumstances incentives may be a helpful policy alternative or supplement.

First, the sheer number of private landowners creates an unmanageable number of “regulated entities” that cannot be monitored cost-effectively. Many behaviors are hidden from public view, such as filling in wetlands or destroying habitat of threatened species. There are inadequate resources to enforce regulations across millions of landowners and exponentially more acreage.²⁸ The high costs and impracticability of enforcement negate what is typically the key benefit of regulation: mass behavior change.²⁹ As a result of administrability concerns and political pressures, many of the major environmental acts allow little intervention in private land use activities.³⁰

Second, conservation regulation often creates strong financial incentives to evade the reach of restrictions, sometimes through socially destructive action. For example, the Endangered Species Act prohibits landowners from harming endangered species or their habitat.³¹ This not only discourages the reporting of endangered species, it also creates an incentive to destroy the endangered species or its habitat to remove the threat of future restrictions.³² In response to these problems, as well as to the unanticipated reach and expense of the Act, the government has tried to add flexibility through provisions for Habitat Conservation Plans. A landowner who enters into a Habitat Conservation Plan can commit an “incidental take” of a threatened or endangered species (i.e., harm, kill, or destroy habitat) if they mitigate the adverse impact through other conservation measures.³³

27. Voluntary land acquisition is another tool that has been effective but still falls short of a complete solution. Most of the land in the United States is in private ownership, and it is not financially plausible or normatively desirable for the government or NGOs to acquire all valuable conservation land in fee simple.

28. See Neil Gunningham & Mike D. Young, *Toward Optimal Environmental Policy: The Case of Biodiversity Conservation*, 24 *ECOLOGY L.Q.* 243, 280 (1997) (“In circumstances of biodiversity protection, where valued attributes are widely dispersed, enforcement resources are thin, and regulation is often left unsupported by the local community, the possibility of regulatory failure is substantial.”).

29. As discussed in Section I.D, *infra*, incentive programs are also vulnerable to enforcement costs, although with incentives these costs can be significantly reduced by rewarding demonstrated outcomes and emphasizing personal contact and constructive partnerships between administrators and local landowners.

30. See William F. Pedersen, *Using Federal Environmental Regulations to Bargain for Private Land Use Control*, 21 *YALE J. ON REG.* 1, 15–23 (2004) (arguing that the Clean Water Act and Endangered Species Act were structured to avoid conflict between regulatory requirements and the autonomy interests of private property owners and state regulators).

31. See Endangered Species Act of 1973, 16 U.S.C. §§ 1531–1544 (2000).

32. See Barton H. Thompson, Jr., *The Endangered Species Act: A Case Study in Takings & Incentives*, 49 *STAN. L. REV.* 305, 315, 351 (1997).

33. See Endangered Species Act §§ 1531–44.

Third, when regulations are enforced, the resulting penalties may demoralize individuals and create negative attitudes towards conservation.³⁴ Punishment is effective at reducing the frequency of undesirable behaviors, but may impair pro-environmental attitudes and perceptions of self-efficacy.³⁵ For example, if a homeowner has to pay a steep environmental fine for destroying habitat, she may generalize the negative emotions from the punishment to species protection or environmentalism generally. Indeed, the enforcement of the Endangered Species Act has resulted in a strong citizen backlash against species-protection legislation and regulation of private land.³⁶ Given the imperfect translation of attitudes to high-cost behaviors, anti-environmental attitudes will not necessarily prompt habitat destruction or polluting behaviors. However, negative attitudes are likely to affect political choices, such as voting against candidates who support environmental protection. Enforcement of any program, including incentives, is inevitably negative at least some of the time (i.e., an individual may perceive the removal of an expected incentive as punishment).³⁷ However, traditional command and control regulation is more punitive in tenor because individuals interact directly with the regulatory authority only for the purpose of punishment. In incentive programs, there are generally a large number of compliant participants whose interaction with the state is explicitly positive (i.e., the receipt of rewards).

Last, traditional command and control approaches³⁸ are often ill-suited for promoting active management because of the need for individualized conservation plans and constitutional constraints.³⁹ With progress in ecological science, it has become clear that many species and ecosystems need more than mere non-interference or preservation. One study found that 63% of recovery plans for

34. DEBORAH DU NANN WINTER & SUSAN M. KOGER, *THE PSYCHOLOGY OF ENVIRONMENTAL PROBLEMS* 90–91 (2004).

35. See Raymond De Young, *Changing Behavior and Making It Stick*, 25 ENV'T AND BEHAV. 485, 498 (1993). Psychologists who have studied effects of behavioral consequences have found that people strongly prefer incentives to penalties. *Id.* As two researchers recently noted, "Receiving rewards that we have earned means that we are no longer at the mercy of a capricious or overcontrolling environment, and we have gained control over our outcomes." Thomas S. Bateman & J. Michael Crant, *Revisiting Intrinsic and Extrinsic Motivation* 7 (Apr. 2003) (working paper, available at http://www.commerce.virginia.edu/faculty_research/Research/Papers/IMOBHDP24.pdf).

36. See Barton H. Thompson, Jr., *Conservation Options: Toward a Greater Private Role*, 21 VA. ENVTL. L.J. 245, 269–70 (2002) (discussing how political pressure has limited the impact of the Endangered Species Act).

37. We can speculate that individuals may in fact overweigh the withdrawal of an incentive due to the psychological phenomenon of loss aversion.

38. Regulatory approaches coupled with mitigation or variance options are better able to facilitate active management by adding flexibility and creating incentives for landowners.

39. The U.N. Convention on Biological Diversity recognized the importance of active management more than a decade ago, see United Nations Convention on Biological Diversity art. 8, June 5, 1992, 1760 U.N.T.S. 79, and since that time scientific support for this type of management has only increased.

various species required either initial restoration or ongoing management.⁴⁰ For example, the black-capped vireo, which is a threatened migratory bird, requires periodic clearing of the tallest trees in its habitat or controlled burns in order to thrive.⁴¹ Constitutional concerns⁴² and strong public resistance make it difficult to force improvements on land or to require landowners to create or actively manage habitat. The constitutional prohibition against total deprivations of economic value, articulated in *Lucas v. South Carolina Coastal Council*, forbids regulation requiring an owner to maintain an entire parcel in its natural or undeveloped state without compensation.⁴³ In cases where the government conditions permission to develop land on exactions requiring landowners to fund habitat restoration, the restoration required under the exaction must be “roughly proportional” to the harms from the permit.⁴⁴ Last, strong per se protection against permanent physical occupations limits the government’s ability to compel, for example, public access or construction of a trail on private land.⁴⁵ Even when regulation does not run afoul of the Constitution, extreme public resistance to government interference with private property frequently derails regulatory efforts. Where it is beyond legislators’ reach, either constitutionally or politically, to require landowners to enhance or manage habitat, incentives are the only tool available to motivate active stewardship.

Despite these limitations, regulatory approaches still play an important role in land conservation. Regulation should be credited with significant gains in pollution reduction and ecosystem protection.⁴⁶ When holdouts are likely (as is often the case with habitat assembly) or when information costs are low so that environmentally valuable land is easily identified, regulation may offer comparative advantages over incentive-based approaches. The “next generation” of environmental strategies requires recognition of the comparative merits of regulation and incentives and careful consideration of the best approach, or combination of approaches, to apply to particular conservation issues.

40. Theodore Foin et al., *Improving Recovery Planning for Threatened and Endangered Species*, 48 BIOSCIENCE 177, 180–84 (1998).

41. See ENVTL. DEF., PROGRESS ON THE BACK FORTY 6 (2000), available at http://www.environmentaldefense.org/documents/150_backforty.pdf.

42. See John D. Echeverria, *Regulating Versus Paying to Achieve Conservation Purposes*, in ALI-ABA COURSE OF STUDY 1141 (2004), available at SJ053 ALI-ABA 1141, 1162.

43. 505 U.S. 1003, 1027 (1992).

44. See *Dolan v. City of Tigard*, 512 U.S. 374, 390 (1994); *Nollan v. Cal. Coastal Comm’n*, 483 U.S. 825, 831 (1987).

45. See *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 421 (1982).

46. Douglas R. Williams, *When Voluntary, Incentive-Based Controls Fail: Structuring a Regulatory Response to Agricultural Nonpoint Source Water Pollution*, 9 WASH. U. J.L. & POL’Y 21, 21 (2002) (“While the wisdom of this program for controlling ‘point sources’ through technology-based effluent limitations has been roundly debated, there is little question that it has yielded sizeable gains in water quality.”).

C. Behavior-focused Strategies: The Rise of Conservation Incentives

In the absence of law or regulation to constrain behavior, the conventional wisdom has been to change attitudes and behavioral change will follow. Environmental nonprofits and regulatory agencies have invested significant resources in education campaigns designed to change behavior by raising awareness and transforming attitudes towards the environment.⁴⁷ Research in both psychology and public policy belies these efforts. Direct attempts to change attitudes through persuasion or information have had limited success.⁴⁸ When attitude change does occur, the research calls into question the assumption that attitude change consistently produces a corresponding change in behavior. Studies have shown that even when individuals report holding pro-environmental attitudes or changing their attitudes towards a more pro-environmental position, their actual behavior is often at odds with their expressed attitudes.⁴⁹

Because of the limitations of regulation and the elusiveness of attitude change, attention has turned to incentives as a way to rapidly alter stewardship behaviors.⁵⁰ Conservation incentives aim to motivate preservation, active management practices, and restoration activities while reducing the demoralizing or alienating effects of solely penalty-based systems. Incentives also provide a mechanism for compensating landowners for projects that create public benefits or positive externalities. Conservation is costly both in terms of management expenses and the opportunity costs of leaving land undeveloped. For example, studies have estimated that the opportunity costs from foregoing development or timbering to preserve habitat for the red-cockaded woodpecker range from \$43,000 to \$100,000 for each breeding pair.⁵¹ Incentives and other market-based

47. For example, the federal government funds an Office of Environmental Education within the EPA whose mission is to increase public knowledge of environmental protection. This office awards annual grants to fund projects devoted to educating the general public, teachers, or students about specific environmental issues. See U.S. Env'tl. Protection Agency, Environmental Education: EE Grants in EPA Region 2, http://www.epa.gov/enviroed/grants/region_02.html (last visited Sept. 28, 2006).

48. Doug McKenzie-Mohr, *Fostering Sustainable Behavior Through Community-Based Social Marketing*, 55 AM. PSYCHOLOGIST 531, 531–32 (2000) (“[E]nhanced knowledge and supportive attitudes often have little or no impact on behavior . . .”).

49. See KATZEV & JOHNSON, *supra* note 10, at 50–52. Psychologists have used the New Environmental Paradigm Instrument, an inventory of questions, to test for attitudes relating to limiting economic growth to ensure environmental protection and living in harmony with nature. Although subjects report strong support for these values, their scores on the instrument have only small correlations to their behavior. See William J. McGuire, *Attitudes and Attitude Change*, in 2 THE HANDBOOK OF SOCIAL PSYCHOLOGY 233, 251 (Gardner Lindzey & Elliot Aronson eds., 3d ed. 1985).

50. See, e.g., United Nations Convention on Biological Diversity, *supra* note 39, art. 11 (calling for use of incentives for conservation, sustainable use, and biodiversity preservation); Joanne L. Dunec, *Economic Incentives: Alternatives for the Next Millennium*, 12 NAT. RESOURCES & ENV'T, Spring 1998, at 292, 295 (“[A]n ever-increasing array of market-based and economic incentive alternatives may ultimately prove more viable in resolving the complex, environmental, water and land use issues of the next millennium.”).

51. ENVTL. DEF., *supra* note 41, at 11–13.

programs enable landowners to internalize a greater share of the benefits of their actions.

Commentators have argued that when information costs are high, well-structured incentives are more efficient than regulation because they are information-forcing.⁵² Landowners self-identify and compete for compensation based on the ecological value of their land. There is a danger, however, that payments that are not competitive or prioritized will be economically inefficient. In other instances, incentives may inappropriately reward land uses that are not commonly understood to be part of a landowner's property rights.⁵³ It is beyond the scope of this Article to analyze the cost-effectiveness of each governmental and private incentive program, particularly given the varying contexts in which these programs operate. Instead, the Article focuses more generally on ways to improve direct payment programs and perpetual conservation easements that are warranted based on efficiency and ecological need or could be warranted on these grounds with program restructuring.

1. Direct Payment Programs: Cost-Share Projects, Limited Term Easements, and Leases

A growing number of direct payment programs provide cost-share assistance on projects, compensation for limited term easements, or rental payments for conservation leases. Direct payment programs offer agencies and nonprofit organizations significant flexibility to target environmental problems or ecosystem services. These programs are a cost-effective solution for short-term needs, such as immediate soil erosion control measures, or when the future of land use, demographic patterns, or even ecological science is too uncertain for longer-term protection.⁵⁴ Direct payment programs are popular with landowners, especially farmers and ranchers, who historically have been reluctant to permanently encumber their family farms with perpetual conservation easements.⁵⁵ However, when the goal is long-term or permanent preservation, particularly of assembled parcels of land, the need to pay landowners for successive terms coupled with the danger of holdouts can make direct payment programs expensive and uncertain. Other drawbacks to the direct payment approach include significant management and monitoring costs as well as the danger of political capture by

52. See, e.g., Salzman, *supra* note 6, at 921.

53. For example, paying a landowner to implement soil erosion controls implies that the landowner has a property right in her topsoil and its dispersion.

54. Term easements or other payment programs can also be used to "buy time" for urgent problems involving habitat, erosion or pollution with the long-term goal of either purchasing easements or fee titles or determining an alternative solution to the problem. See Frederico Cheever & Nancy McLaughlin, *Why Environmental Lawyers Should Know (and Care) About Land Trusts and Their Private Land Conservation Transactions*, 34 ENVTL. L. REP. 10,223, 10,233 (2004).

55. Conservation easement donation by farmers and ranchers is likely to increase under recent federal legislation that allows qualified, nonincorporated farmers and ranchers to deduct 100% of their adjusted gross income and carry over these deductions for up to fifteen years. See Pension Protection Act of 2006, Pub. L. No. 109-280, §1206(a)(1), 120 Stat. 780 (2006).

special interest groups. An issue of increasing importance is the need to utilize “safe harbor” protection under the Endangered Species Act⁵⁶ for conservation leasing or cost-share arrangements; otherwise, landowners are reluctant to increase habitat for species on their property for fear of future restrictions on land use.

a. Cost-Share Projects

In cost-share projects, landowners receive compensation for conservation practices, such as restoring, enhancing, or maintaining soil or habitat, or refraining from certain activities, such as grazing or cultivation. Federal and state government agencies, as well as a limited number of nonprofit organizations, use cost-share incentives for short-term remediation or conservation projects. Some programs provide financial compensation upfront and in advance of the project; others parcel out payments in installments based on progress or pay only upon completion and certification of the project. Cost-share programs are typically administered through local or regional offices, often assisted by nature conservation districts that coordinate federal, state, and local initiatives and respond to the specific needs of a locality.

The federal government offers several programs that provide cost-share assistance to landowners, including the Conservation Reserve Enhancement Program,⁵⁷ Stewardship Incentives Program, Wetlands Reserve Program,⁵⁸ and Partners for Fish and Wildlife Program.⁵⁹ These programs target specific practices or types of land, solicit applications or bids, and then provide local support to landowners to carry out the projects. For example, the Partners for Wildlife program, administered by the U.S. Fish and Wildlife Service, provides a cost-share to fund habitat restoration on private lands for periods of at least ten years.⁶⁰ Landowners use this funding to engage in activities such as restoring wetlands and riparian areas, planting native grasses, and setting prescribed fires.

56. *See generally* Announcement of Final Safe Harbor Policy, 64 Fed. Reg. 32,717 (June 17, 1999).

57. For example, the Conservation Reserve Enhancement Program provides funds to restore riparian areas, create riparian buffers along streams and rivers to shelter aquatic endangered species from runoff, or place riparian buffers under permanent conservation easement. *See* Farm Serv. Agency, U.S. Dep’t of Agric., Conservation Reserve Enhancement Program, <http://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=cep> (last visited Sept. 28, 2006).

58. The Wetlands Reserve program has several components: permanent easements, thirty-year easements, and cost-share assistance for wetlands projects. *See* 16 U.S.C. §§ 3837, 3837a (2000); NATURAL RES. CONSERVATION SERV., U.S. DEP’T OF AGRIC., KEY POINTS: WETLANDS RESERVE PROGRAM (2004), <http://www.nrcs.usda.gov/PROGRAMS/farmland/2002/pdf/WRPKyPts.pdf/> [hereinafter KEY POINTS: WETLANDS RESERVE PROGRAM].

59. U.S. Fish and Wildlife Serv., Partners for Fish and Wildlife Program: Frequently Asked Questions, <http://ecos.fws.gov/partners/viewContent.do?viewPage=faq> (last visited Sept. 28, 2006).

60. *Id.*

State governments and nonprofits also provide financial compensation and technical assistance for conservation projects.⁶¹ For example, the Texas Landowner Incentive Program offers up to 75% cost-share assistance to landowners to restore native vegetation, fence sensitive areas, manage grazing, or engage in other qualified management practices that benefit threatened or endangered species or their habitat.⁶² In order to qualify, the property must be within the historic range of the targeted species and results must be measured periodically by state wildlife officials.⁶³ Nonprofits have also begun to sponsor direct payment programs to compensate landowners for preserving habitat and wildlife or providing ecosystem services on their land. A recent initiative, the Environmental Defense Fund's Landowner Conservation Assistance Program, pays landowners for practices that improve the habitats of the golden-cheeked warbler and the black-capped vireo.⁶⁴

b. Term Easements and Conservation Leases

Term easements grant development or other conservation interests in land to an agency or nonprofit for a specified number of years. Landowners are paid directly for term easements; they are not eligible for a federal tax deduction because they have received compensation and the easement is not in perpetuity. The majority of term easement programs are sponsored by federal or state government and target agricultural, timber, and ranching land. The federal Wetlands Reserve program, for example, compensates landowners for a thirty-year term easement that requires that at least 70% of the enrolled wetlands acreage be returned to its natural condition.⁶⁵ At the state level, the Washington Riparian Forest program pays small forest landowners 50% of the timber value of their land for conveying a fifty-year easement on land buffering a lake, river, stream, pond, or wetland.⁶⁶ Compensation for term easements is generally in the form of an upfront payment based on a share of the fair market value of the easement with some programs capping payments for certain types of land.⁶⁷

61. Twenty states offer full grants while thirty-seven states offer cost-share programs or no interest loans. SUSAN GEORGE, DEFENDERS OF WILDLIFE, CONSERVATION IN AMERICA: STATE GOVERNMENT INCENTIVES FOR HABITAT CONSERVATION, A STATUS REPORT 4 (2002), http://www.biodiversitypartners.org/pubs/CinAREport/Conservation_in_America.pdf.

62. See Texas Parks and Wildlife Dep't, Landowner Incentive Program, <http://www.tpwd.state.tx.us/landwater/land/private/lip/> (last visited Sept. 10, 2006).

63. *Id.*

64. The Environmental Defense has observed that the program has been extremely popular with landowners but that the substantial costs of surveys and administration have limited the funds available. ENVTL. DEF., *supra* note 41, at 25–26.

65. See KEY POINTS: WETLANDS RESERVE PROGRAM, *supra* note 58.

66. WASH. STATE DEP'T OF NATURAL RES., FORESTRY RIPARIAN EASEMENT PROGRAM: CONSERVING WASHINGTON'S FORESTED STREAM SIDES 3–4 (2005), <http://www.dnr.wa.gov/sflo/frep/frepfaqs.pdf> [hereinafter FORESTRY RIPARIAN EASEMENT PROGRAM].

67. See, e.g., NATURAL RES. CONSERVATION SERV., U.S. DEP'T OF AGRIC., FACT SHEET: GRASSLAND RESERVE PROGRAM 1 (2006), http://www.nrcs.usda.gov/programs/GRP/pdf_files/GRPFactSheet3-6-06.pdf [hereinafter

Conservation leases are a close relative to term easements. Leases are structured for a finite period of time but, unlike term easements, leases generally compensate landowners annually rather than in a lump sum. One of the most prominent and costly conservation leasing programs, the Conservation Reserve Program, makes annual rental payments to farmers to forego cultivation of their land for periods of ten to fifteen years.⁶⁸ In general, leases are less costly to enforce than term easements. Agencies can simply discontinue lease payments for breach of the rental contract, whereas with term easements, the agency must recover the lump sum payment that the landowner received at the time of the easement transaction.

2. Transfers of Partial Property Interests: Permanent Conservation Easements

The past two decades have seen exponential growth in the use of perpetual conservation easements. The amount of land encumbered by conservation easements increased from 1.4 million acres in 1998 to 5.1 million acres under easement in 2003.⁶⁹ All fifty states have adopted conservation easement statutes, with approximately half of those modeled on the Uniform Conservation Easement Act.⁷⁰ Conservation easement acts enable landowners to donate or sell an interest in land that imposes obligations on the landowner and her successors to retain or protect the ecological, open-space, or scenic values of the property.⁷¹ In the prototypical easement transaction, a landowner donates the right to develop, build out, or subdivide her property to a qualified charitable organization, most often a land trust. The donor is entitled to a federal charitable income tax deduction based on the difference between the value of the land before the easement and the value of the land after it has been encumbered by the easement.⁷² Recent legislation increases the maximum deduction from 30% to 50% of the donor's adjusted gross income and lengthens the period that the donor may carry forward the deductions from five years to fifteen years.⁷³ Qualified farmers and ranchers receive an even more generous incentive under the new law

FACT SHEET: GRASSLAND RESERVE PROGRAM] (Grassland Reserve Program compensates landowners for term easements based on 30% of the fair market value of the land less the value of the grassland); NATURAL RES. CONSERVATION SERV., U.S. DEP'T OF AGRIC., CONSERVATION PROGRAMS MANUAL: WETLAND RESERVE PROGRAM, § 514.28, http://policy.nrcs.usda.gov/scripts/lpsiiis.dll/M/M_440_514_E.htm (Wetlands Reserve Program uses fair market value to determine compensation for thirty-year easements unless the agency has established payment rate caps for specific geographic areas or land-use types) (last visited Sept. 2, 2006).

68. See 7 C.F.R. § 1410.2 (2005).

69. Land Trust Alliance, National Land Trust Census (2006), <http://lta.org/census/>.

70. See Nancy A. McLaughlin, *Rethinking the Perpetual Nature of Conservation Easements*, 29 HARV. ENVTL. L. REV. 421, 426 nn.13 & 15 (2005).

71. See UNIF. CONSERVATION EASEMENT ACT § 1(1), 12 U.L.A. 51 (1981).

72. See 26 C.F.R. § 1.170A-1(c)(1), (h)(1)-(4).

73. The carry-forward period applies to the years following the deduction in the tax year of the donation. See Pension Protection Act of 2006, Pub. L. No. 109-280, § 1206(a)(1), 120 Stat. 780 (2006).

and may deduct up to 100% of adjusted gross income.⁷⁴ The expanded incentive applies only to easements donated in tax years 2006 and 2007 unless Congress extends these provisions.⁷⁵ To be eligible for the federal income tax deduction, the easement must be in perpetuity, meaning that it runs with the land and binds all successive owners.⁷⁶ The IRS also requires that the land must be conserved for the purpose of use by the general public, protection of a relatively rare habitat or ecosystem, preservation of open space that is for the scenic enjoyment of the general public, historic preservation, or a use that is both beneficial to the public and pursuant to a federal, state, or local conservation policy.⁷⁷ In addition to the federal income tax deduction, the donor may be able to exclude a portion of the value of the land encumbered by the easement from federal estate taxes⁷⁸ or may be eligible for state income tax credits.⁷⁹

With the proliferation of easements, there has been significant controversy over their perpetual duration, ecological value, and public costs.⁸⁰ Some commentators have criticized perpetual easements as unrealistic in light of inevitable changes in scientific understanding, land development patterns, and the needs of future generations.⁸¹ Others have argued, however, that conservation easements play a key role in promoting stewardship and that common law charitable trust rules can address the problem of changed circumstances.⁸² When long-term protection is sought, perpetual easements may be less costly than continually paying landowners through renewable short-term easement agreements or leases. The cost-effectiveness of permanent protection versus shorter-term contracts depends on the time span necessary for ecological improvement, the present value of a stream of payments versus lump sum compensation, the risk of holdouts fragmenting assembled reserves through non-renewal of contracts, and enforcement costs.⁸³

74. *See id.*

75. *See id.*

76. *See* 26 C.F.R. §1.170A-14(a).

77. *See id.* § 1.170A-14(d)(1)(i)-(iv).

78. I.R.C. § 2031(c) (2000).

79. Dominic P. Parker, *Land Trusts and the Choice to Conserve Land with Full Ownership or Conservation Easements*, 44 NAT. RESOURCES J. 483, 496 (2004).

80. *See* Joe Stephens & David B. Ottaway, *Developers Find Payoff in Preservation*, WASH. POST, Dec. 21, 2003, at A1.

81. *See generally* Julia D. Mahoney, *Perpetual Restrictions on Land and the Problem of the Future*, 88 VA. L. REV. 739 (2002).

82. Professor McLaughlin has argued that

[t]he perpetuity issue is neither new nor unique to . . . conservation easements. . . . charitable trust rules were developed and refined over the centuries to deal precisely with the issue presented by perpetual conservation easements—how to adjust when the terms or stated purpose of a charitable gift become obsolete or inappropriate due to changed conditions.

Nancy McLaughlin, *Amending Perpetual Conservation Easements: A Case Study of the Myrtle Grove Controversy*, 40 U. RICH. L. REV. 1031, 1070 (2006).

83. Indeed, some commentators have argued persuasively that perpetual easements may not make sense in the future due to changes in ecological science,

D. Flies in the Ointment: Challenges for Conservation Incentives

With the rise of conservation incentives, there has been growing recognition that incentives share some of the problems of regulation. First, it is becoming increasingly clear that incentives do not obviate the need for monitoring and enforcement of private landowners. Noncompliance or cheating is often not visible to neighbors or community members, so there are fewer whistleblowers or social norms to restrain behavior. Second, conservation incentives, like regulation, face challenges of cost-effectiveness and political capture. Conservation incentives have suffered from inefficient participant selection and compensation formulas, as well as overlap with other programs. Incentives are also not appropriate for all situations. For example, the moderate and often variable response to incentives indicates that they may not be the best tool for situations where damage is imminent and irreversible.⁸⁴

Federal and state direct payment programs have encountered significant enforcement costs. Term easements, with their upfront compensation structure, have proven especially difficult to enforce. As a result, some governmental agencies are shifting their focus towards targeted cost-share projects or permanent easements. Often, the most innovative and ecologically sophisticated programs are also the most vulnerable to cheating. For example, the federal Conservation Security Program administered in Washington state recently found that fifteen farmers may have altered soil samples and submitted false information to collect over \$280,000 in incentive payments.⁸⁵ While it is relatively easy to monitor actions like the installment of fencing, it is much more difficult to monitor low-visibility practices such as the use of pesticides and fertilizers.

Similarly, enforcement of permanent conservation easements is a concern due to the rapid increase in easement-encumbered acreage and the second-generation issues that arise with transfers from the original easement donor to successive owners.⁸⁶ A 1999 study by the Bay Area Open Space Council found that 50% of easements were not monitored regularly by governmental or non-profit easement holders and of the 50% that were monitored, 14% of landowners were violating the terms of the easement.⁸⁷ Another study estimated that over 2700 landowners nationally have violated the terms of their easements.⁸⁸ These studies indicate that while there are problem easements, the majority of landowners comply with easement restrictions. Land trusts want to ensure that compliance

population, or other circumstances and may tie the hands of future generations. *See* Mahoney, *supra* note 81.

84. *See* Gunningham & Young, *supra* note 28, at 279–80.

85. John Stucke, *Farmers May Have Cheated to Get Subsidies*, SPOKESMAN REVIEW, Feb. 3, 2006.

86. *See* Federico Cheever, *Public Good and Private Magic in the Law of Land Trusts and Conservation Easements: A Happy Present and a Troubled Future*, 73 DENV. U. L. REV. 1077, 1077, 1087 (1996); *see also* SALLY K. FAIRFAX ET AL., BUYING NATURE 268–69 (2005) (noting that a large number of land trusts were formed in the past twenty years and that these organizations have no track record and limited resources for stewardship and enforcement).

87. Stephens & Ottaway, *supra* note 80, at A1.

88. *Id.*

continues as more easement-encumbered land changes hands. However, most land trusts are grassroots or fledgling organizations that have insufficient funds for legal enforcement.⁸⁹ Compounding the problem, private citizens lack standing to bring suit to enforce the provisions of conservation easements.⁹⁰ In an effort to address these issues, the Land Trust Alliance has recently developed a voluntary accreditation program⁹¹ that requires land trusts to engage in regular monitoring and plan for stewardship and enforcement funding.⁹²

In addition to enforcement problems, some conservation incentives suffer from the same issues of cost-benefit efficacy that plague their regulatory counterparts. Incentive programs for farmers have come under attack for providing insufficient public benefit relative to their massive budgetary outlays. One example, the Conservation Reserve Program, has taken 36 million acres of land out of active agricultural use at a cost of approximately \$1.7 billion per year.⁹³ Policy analysts have noted that Conservation Reserve Program lease payments are often not proportionate to ecological gains and that greater environmental benefit would accrue from targeting new lands, rather than the common practice of re-enrolling previously leased land.⁹⁴ Further, because conservation incentive programs have proliferated in a rapid and uncoordinated fashion, farmers may be eligible for multiple sources of conservation funding each year.

Permanent conservation easements are also vulnerable to excessive costs. A donor may attempt to increase her tax savings by exaggerating the pre-easement

89. When land trusts seek to enforce the easement obligations, the legal costs can be staggering. For example, the Pennsylvania French and Pickering Creeks Conservation Trust spent nine years and \$100,000 in court costs and legal fees litigating an easement violation. Mary Jo Joyce, *The Problem with Easements*, PHILANTHROPY MAG., Sept. 1, 2000, available at <http://www.philanthropyroundtable.org/article.asp?article=1143&paper=0&cat=147>. Forty percent of all land trusts are less than ten years old. Janet Mackey, Conservation Easements in Maryland: Analysis of this Land Conservation Tool 10 (May 14, 2004) (unpublished manuscript, available at <http://www.publicpolicy.umd.edu/faculty/nelson/jmackey.doc>).

90. Carol Necole Brown, *A Time to Preserve: A Call for Formal Private-Party Rights in Perpetual Conservation Easements*, 40 GA. L. REV. 85, 109 (2005).

91. Land Trust Alliance, Accreditation (May 26, 2006), <http://lta.org/accreditation/>.

92. See LAND TRUST ALLIANCE, LAND TRUST STANDARDS AND PRACTICES 13-14 (2004), available at http://www.lta.org/sp/land_trust_standards_and_practices.pdf.

93. U.S. Dep't of Agric., Farm Bill Forum Comment Summary and Background: Conservation Reserve Program and Conservation Reserve Enhancement Program 2, http://www.usda.gov/documents/CONSERVATION_RESERVE_PROGRAM_AND_CONSERVATION_RESERVE_ENHANCEMEN.doc (last visited Sept. 23, 2006) [hereinafter Farm Bill Forum Comment Summary and Background].

94. For example, some researchers have noted that while the emphasis in many federal programs is on long-term participation and re-enrollment, much greater gains comes from targeting new practices or lands. For example, assuming a budget of \$500 million, a program that provides equal payments for new and existing practices will achieve 75% less environmental gain than a program that focuses exclusively on new conservation activities. ANDREA CATTANEO ET AL., ECON. RESEARCH SERV., U.S. DEP'T OF AGRIC., ECON. RESEARCH REPORT NO. 5, FLEXIBLE CONSERVATION MEASURES ON WORKING LAND, at iv (2005).

value of the property and the decrease in value from the easement.⁹⁵ In some cases, appraisers have misused the “subdivision development analysis” method where they calculate the value of the land prior to the easement as the price a developer would pay rather than by comparing it to similar properties that have sold recently in that market.⁹⁶ Congress, recognizing the potential for valuation abuse, recently adopted stricter standards and penalties. Legislation passed this year reduces the level of overvaluation required to impose taxpayer liability for a substantial or gross valuation misstatement and imposes monetary penalties on appraisers if that misstatement is attributable to an incorrect appraisal.⁹⁷ It will be interesting to assess how these reforms work in practice and whether the IRS has sufficient resources for enforcement.

For conservation incentives to succeed, we must structure them to motivate behavior change in landowners, deliver cost-effective ecological gains, and minimize enforcement costs. Incentives, like regulation, can suffer from enforcement costs and economic inefficiencies. Conservation programs can greatly reduce these costs through careful attention to incentive design and administration. Part II turns to discussion of the psychology research on incentives and behavior with an eye to how this research should inform incentive design.

II. BEHAVIORAL RESEARCH: HOW INDIVIDUALS RESPOND TO FINANCIAL INCENTIVES

A. *An Introduction to Behavioral Learning Theory*

Using antecedents and consequences to modify behavior can be a rapid and effective method of behavior change.⁹⁸ Research on behavioral learning theory and operant conditioning, pioneered by B.F. Skinner, has shown that humans and other animals repeat and ultimately learn a behavior based on the behavior’s immediate consequences.⁹⁹ Hundreds of experiments in both laboratory and field settings have demonstrated that reinforcement in the form of a reward or other positive consequence¹⁰⁰ following a target behavior increases the probability that

95. See 26 C.F.R. § 1.170A-14(h)(3) (2005); see also Nancy A. McLaughlin, *Questionable Conservation Easement Donations*, 18 PROB. & PROP. 40, 44 (2004).

96. McLaughlin, *supra* note 95, at 44–45.

97. See Pension Protection Act of 2006, Pub. L. No. 109-280, § 1219(b)(1), 120 Stat. 780 (codified at 26 U.S.C. § 6695A(a)–(b) (2000)). The 2006 amendments also establish requirements for “qualified appraisers” and delegate power to the IRS to promulgate new regulations on appraiser qualifications. See *id.* § 6695A(c).

98. See Philip K. Lehman & E. Scott Geller, *Behavior Analysis and Environmental Protection: Accomplishments and Potential for More*, 13 BEHAV. & SOC. ISSUES 13, 18 (2004).

99. See generally B.F. SKINNER, *THE BEHAVIOR OF ORGANISMS: AN EXPERIMENTAL ANALYSIS* (1938).

100. Technically, rewards are unannounced positive contingencies following the target behavior and incentives are antecedents that are announced in advance. Rewards and incentives have the same behavioral effect and so for purposes of this article are treated interchangeably.

the behavior will be repeated in the future.¹⁰¹ For example, job bonuses attempt to shape employee behavior by increasing the incidence of high-level job performance. If a behavior stops receiving reinforcement it will eventually be extinguished (i.e., the individual will no longer perform the behavior).¹⁰²

Although modern research has expanded beyond Skinner's exclusively behavioral focus, behaviorism's early insights about the role of rewards and punishments remain the bedrock of both psychological and economic approaches to behavior change.¹⁰³ Positive reinforcement programs are used in diverse settings such as motivating employees in corporations, teaching students, changing lifestyle habits of chronically ill patients, reforming juvenile criminal offenders, and working with individuals in mental health counseling.¹⁰⁴ In the context of conservation, the current system of legal, structural, and social reinforcers often favors high levels of development and consumption. Environmentally-friendly behaviors impose costs in terms of project investment, time, information-gathering, and convenience. These activities generally are not reinforced with tangible rewards.¹⁰⁵ If the action is not highly visible or the community does not possess pro-environmental values, then intangible "social" rewards such as esteem or praise are also lacking. The use of monetary incentives, such as direct payments or tax breaks, has the potential to realign the cost-benefit calculus and motivate conservation behavior.

B. Research on Monetary Incentives for Pro-environmental Behavior

1. Incentives Studies: The Challenges of Eliciting Behavioral Curtailment

Studies show that monetary incentives have moderate positive effects on pro-environmental behavior but that low participation can limit the success of incentive programs. The positive effects of incentives have been shown in experiments targeting environmental behaviors such as energy conservation, recycling, and mass transit use.¹⁰⁶ The key strengths of incentives are their ability to modify behavior rapidly and their effectiveness with individuals who possess varying environmental values. Participants in incentive programs show rapid

101. See SKINNER, *supra* note 99, at 21 ("If the occurrence of an operant is followed by presentation of a reinforcing stimulus, the strength is increased.")

102. See *id.* ("If the occurrence of an operant already strengthened through conditioning is not followed by the reinforcing stimulus, the strength is decreased.")

103. For behaviorists, learning is an observed behavioral response and cognitive process and motivation are seen as irrelevant. Behaviorism has been criticized for this input/output "black box" model and, as a result, many researchers today have a more expansive approach viewing behavioral consequences, cognitive processes, and social motivations as playing important and inter-related roles.

104. See generally STEPHEN RAY FLORA, *THE POWER OF REINFORCEMENT* (2004).

105. There are numerous instances where resource-depleting activities are reinforced with financial incentives. See, e.g., Dana Clark & David Downes, *What Price Biodiversity?: Economic Incentives and Biodiversity Conversion in the United States*, 11 J. ENV'TL. L. & LITIG. 9, 29-32 (1996) (reviewing tax incentives for extraction of oil, gas, and timber).

106. William O. Dwyer et al., *Critical Review of Behavioral Interventions to Preserve the Environment: Research Since 1980*, 25 ENV'T & BEHAV. 275, 305-09 (1993).

behavioral change with no delay or latency period for learning.¹⁰⁷ Rewards are effective not only with environmental supporters but also with individuals who lack pro-environmental motivations or attitudes.

Experimental research suggests that incentives consistently produce moderate, rather than dramatic, effects on individual environmental behaviors. Although there are outliers at both ends of the spectrum, the bulk of experiments have found increases in net pro-environmental behavior in the range of 10%–30% averaged across subject groups.¹⁰⁸ Of course, these comparisons are imperfect because studies vary in the size of incentives, the timing of reinforcement, the type of environmental behavior targeted, and the feasibility of extreme behavior change (e.g., a family cannot reduce electricity usage by 75% through behavior modification alone). Nonetheless, it is unusual for any psychological or field study to produce a striking increase in net pro-environmental behavior among a subject group.¹⁰⁹ In incentive studies that have shown marked increases in environmental behavior, the net increase is often due to a strong response from a subgroup of participants.¹¹⁰ Participation levels are typically in the low or moderate range.¹¹¹ Even when subjects elect to participate in an incentive study, the number that actually performs the target behavior can be low.¹¹²

Field study of incentive programs has been limited due to the difficulty of isolating the effects of incentive programs from other environmental or market

107. See De Young, *supra* note 35, at 496.

108. See, e.g., Richard A. Winett & Michael T. Nietzel, *Behavioral Ecology: Contingency Management of Consumer Energy Use*, 3 AM. J. COMMUNITY PSYCHOL. 123, 129 (1975) (using economic incentives to reduce electricity consumption by 15%); see also R.M. Foxx & D.F. Hake, *Gasoline Conservation: A Procedure for Measuring and Reducing the Driving of College Students*, 10 J. APPLIED BEHAV. ANALYSIS 61, 72 (1977) (subject group who received a monetary reward reduced mileage by 20%, while control subjects who were not offered a reward did not reduce their mileage); Steven C. Hayes & John D. Cone, *Reducing Residential Electrical Energy Use: Payments, Information, and Feedback*, 10 J. APPLIED BEHAV. ANALYSIS 425, 429 (1977) (33% reduction in electricity use in response to cash rebates).

109. One notable exception to this is the success of bottle bills where consumers receive ongoing reinforcement in the form of a substantial incentive every single time they recycle a can at a designated depository. For example, Michigan, which provides a substantial ten-cent refund every time a consumer recycles an aluminum can, has achieved a recycling rate of 95%. See Jennifer Gitlitz, *Must the Recovery of Valuable Cans and Bottles Be Such an Intractable Challenge?*, BOTTLE BILL RESOURCE GUIDE, <http://www.bottlebill.org/resources/news/2005/9-30-WasteManagementWorld.htm> (last visited Sept. 29, 2006).

110. See L. Needleman & E.S. Geller, *Comparing Interventions to Motivate Work-Site Collection of Home-Generated Recyclables*, 20 AM. J. COMMUNITY PSYCHOL. 775, 776–78 (1992); J. Witmer & E. Geller, *Facilitating Paper Recycling: Effects of Prompts, Raffles, and Contests*, 9 J. APPLIED BEHAV. ANALYSIS 315, 320–22 (1976).

111. See Robert E. Pitts & James L. Wittenbach, *Tax Credits as a Means of Influencing Consumer Behavior*, 8 J. CONSUMER RES. 335, 336–38 (1981) (discussing problem of lack of consumer awareness).

112. Even some studies with attractive rewards have found low rates of participation. See generally E. SCOTT GELLER ET AL., PRESERVING THE ENVIRONMENT: NEW STRATEGIES FOR BEHAVIOR CHANGE (1982).

forces and the long time span required for ecosystem improvement. The field studies that have been completed mirror the moderate behavior change and participation levels found in experimental research. For example, one study found that federal conservation compliance incentives resulted in a 10% reduction in soil erosion on U.S. croplands from 1982 to 1997.¹¹³ The Conservation Reserve Program has had success increasing duck populations by over two million per year and reducing soil erosion, although these gains must be viewed as moderate in light of the thirty-six million acres taken out of farm production at a cost of over \$1.7 billion per year.¹¹⁴ Field studies of incentive programs, like their laboratory counterparts, have found that participation rates vary but are typically modest. Cost-share programs for wildlife habitat draw relatively small numbers of applications compared to more generous agricultural subsidies for keeping land out of production.¹¹⁵ A major reason for low participation is that incentives are often not widely publicized, which leaves consumers unaware of their availability.¹¹⁶ Also, small incentives do not appear to catch people's attention or motivate their participation.¹¹⁷

Another reason for moderate behavior change and suboptimal participation is individuals' marked resistance to changing their ongoing behavior and habits. One of the most serious missteps of the environmental movement has been to underestimate the allure of convenience, comfort, and the maintenance of status quo behaviors. Individuals prefer to invest in new technology, such as the purchase of energy-efficient appliances, rather than change their daily behaviors and habits.¹¹⁸ People perceive investments in technology as either neutral or an improvement in quality of life, while behavior curtailment is often experienced as a deprivation.¹¹⁹ Curtailment is also challenging because it requires continuing reinforcement in order to maintain the behavior whereas an investment in

113. See Katherine Smith & Marca Weinberg, *Measuring the Success of Conservation Programs*, AMBER WAVES, Sept. 2004, at 14, http://www.ers.usda.gov/Amberwaves/september04/pdf/feature_conservationsept2004.pdf.

114. Farm Bill Forum Comment Summary and Background, *supra* note 93, at 2.

115. For example, data on the federal Wildlife Habitats Incentive program in Michigan show that there were 164 applications in 2001, with 72 of those funded. See NATURAL RES. CONSERVATION SERV., U.S. DEP'T OF AGRIC., 2001 WILDLIFE HABITAT INCENTIVES PROGRAM: MICHIGAN SUMMARY 1 (2001), <http://www.nrcs.usda.gov/programs/whip/factsheets/WHIP01/Mi-whip.pdf>.

116. Pitts & Wittenbach, *supra* note 111, at 336.

117. See Paul C. Stern, *Blind Spots in Policy Analysis: What Economics Doesn't Say About Energy Use*, 5 J. POL'Y ANALYSIS & MGMT. 200, 210–11 (1986) [hereinafter Stern, *Blind Spots*] (concluding that larger incentives increase rate of participation as well as net amount of behavioral change by subject groups); see also Henry E. Jacobs & J.S. Bailey, *Evaluating Participation in a Residential Recycling Program*, 12(2) J. ENVTL. SYS. 141, 145–50 (1982) (penny-per-pound recycling incentive did not increase recycling behavior but lottery chance to win \$5 increased recycling by 15%).

118. See NICKERSON, *supra* note 8, at 96.

119. Curtailment refers to long-term changes in behavior that involve giving something up, such as using less water or changing to less toxic but more time-intensive means of pest control. Willett Kempton et al., *Psychological Research for the New Energy Problems: Strategies and Opportunities*, 47 AM. PSYCHOLOGIST 1213, 1216–17 (1992).

technology (e.g., purchase of a hybrid car) requires only a one-time incentive.¹²⁰ In the case of private land stewardship, most conservation work requires ongoing effort and changes in land use practices. There is no technological quick fix for preserving habitat or open space. In order to succeed, incentive programs must be designed to motivate and maintain long-term behavior curtailment.

Although the research shows that incentives are not a cure-all, they remain one of the most effective tools in our arsenal. Behavior change motivated by incentives exceeds that resulting from methods such as education, persuasion, prompting, or feedback.¹²¹ The comparative advantages of incentives relative to other approaches underscores their value to conservation efforts, especially given the political opposition in the U.S. to penalties or pricing that impounds environmental harms.

2. Incentive Must Continue Across the Desired Temporal Span of Behavior

The introduction of a monetary incentive causes rapid behavior change; the withdrawal of an incentive terminates the behavior with similar speed.¹²² In virtually every research study that has measured behavior before and after the introduction of a tangible incentive, behavior returned to its pre-study baseline as soon as the incentive ended.¹²³ The lack of maintenance does not vary based on the type of behavior or environmental issue—withdrawal of incentives terminates behaviors such as car pooling, bus use, recycling, and reducing residential energy consumption.¹²⁴ To maintain behavior change, financial incentives must extend across the full duration desired for the conservation behavior. It is not necessary to reward the behavior every single time it is performed so long as it is rewarded intermittently. Intermittent schedules of reinforcement are more effective at motivating long-term behavior maintenance than constant reinforcement.¹²⁵ Interestingly, behavioral response is stronger when individuals are rewarded sporadically and unpredictably (i.e., the number of responses required to elicit reinforcement varies) than when they are rewarded at fixed intervals or every n^{th} time they perform a behavior.¹²⁶

In the absence of ongoing financial incentives, non-monetary reinforcement with social approval or personal commitments may encourage

120. *Id.* at 1216.

121. For example, Hayes and Cone's study found that incentives were more effective in reducing energy consumption than was providing information on reduction of energy use or giving daily feedback about individual energy consumption. Steven C. Hayes & John D. Cone, *Reducing Residential Electrical Energy Use: Payments, Information, and Feedback*, 10 J. APPLIED BEHAV. ANALYSIS 425, 428, 433 (1977); *see also* Schultz et al., *supra* note 106, at 116–17 (1995) (noting that financial incentives were the most effective method to encourage recycling).

122. De Young, *supra* note 35, at 497.

123. *See* Dwyer et al., *supra* note 106, at 305–07.

124. *See, e.g., id.* at 305–09.

125. *See, e.g.,* WINTER & KOGER, *supra* note 34, at 92–95.

126. *See id.*

behavior maintenance.¹²⁷ Social rewards such as certificates, awards, or other forms of esteem in one's community best reinforce stewardship behavior when the behavior is of low to moderate cost and community norms favor conservation. Like financial incentives, social rewards need to be provided intermittently unless the individual both internalizes the relevant environmental value and acts in accordance with it. Asking participants to make visible, personal commitments, such as signing a pledge, appears to create longer-lasting behavior change. For example, subjects who consented in advance to publication of their names in post-study marketing and publicity materials used 12% less natural gas and 24% less electricity than controls.¹²⁸ These effects were still significant in a follow-up measure taken one year after the study, even though the subjects' names were never published.¹²⁹ There is no research that addresses whether commitment strategies are effective for extremely high cost behaviors. A farmer concerned with profitability and distrustful of environmentalism is unlikely to agree to leave land fallow or restore rare species habitat without compensation. Owners of second homes and retreats, who frequently prize the undeveloped quality of their land, are more likely to make voluntary pledges and to value social recognition for conservation behavior.

Lack of durable effect after a financial incentive ends is a thorny issue for proponents of incentive programs. Durability is a particular concern for financial incentive programs aimed at long-term behavioral changes, such as conservation and land stewardship. When behavior is costly or individuals have negative attitudes towards conservation, social reinforcement or commitment strategies are unlikely to yield long-term behavior change. In these cases, intermittent provision of monetary incentives, either alone or in combination with social reinforcement, is necessary to ensure maintenance of conservation behaviors. Providing ongoing rewards, even on an intermittent basis, can become costly for programs.¹³⁰ Policymakers must consider the full cost of reinforcement, and the time span necessary for ecological improvement, when determining whether incentives will be cost-effective.

127. See Dwyer et al., *supra* note 106, at 313 (noting, for example, that the social aspects of carpooling may continue to motivate drivers when financial incentives or reserved-parking eligibility have ended).

128. See M.S. Pallak et al., *Commitment and Energy Conservation*, in 1 APPLIED SOCIAL PSYCHOLOGY ANNUAL 235, 242 (L. Bickman ed., 1980).

129. See *id.* at 243. Other studies have confirmed that commitment strategies produce longer-lasting behavior change than financial incentives. Dwyer et al., *supra* note 106, at 286. Unfortunately, there is a dearth of research measuring behavioral maintenance across long durations of time, such as five- or ten-year intervals.

130. The need to continuously provide incentives for behavior change highlights the benefits of using prices, which both impound social costs and provide continual reinforcement to consumers.

3. Crowding Out of Intrinsic Motivation

In certain situations, monetary rewards can undermine or “crowd out” intrinsic motivation.¹³¹ Psychologists define intrinsic motivation as motivation to act that is not driven by external intervention or reinforcement.¹³² The research shows that financial rewards reduce intrinsic motivation when the reward is contingent on engaging in an activity, completing a task or, under certain conditions, performing well.¹³³ Rewards that are unexpected or are received merely for agreeing to participate have no effect on intrinsic motivation.¹³⁴ Subjects who are intrinsically motivated apply more efficient strategies to problem solving, engage in greater self-regulation of behavior, and show more elaborate cognitive processing of information.¹³⁵ When an individual perceives an incentive, rather than internal motivation, as the driving force behind her behavior, she may begin to see engaging in a given behavior absent an incentive as unattractive or even foolish.¹³⁶ This may reduce the level of behavior change and compliance, generalize to other environmental attitudes, or affect political choices. Once crowding out occurs, individuals are less likely to voluntarily engage in the behavior when the incentive ends or may demand larger incentives for actions that they might have previously undertaken for a much smaller incentive.¹³⁷

There has been distress among scholars and environmentalists about the effects of rewards on motivation and values.¹³⁸ While intrinsic motivation is a matter of concern, the impact of incentives on voluntary environmental action has been overstated. A significant proportion of incentive recipients are not at risk for impaired intrinsic motivation from incentives. The reduction of intrinsic motivation is at issue only when the task is interesting, meaning that the individual

131. See BRUNO S. FREY, *INSPIRING ECONOMICS* 55–70 (2001); EDWARD L. DECI & RICHARD M. RYAN, *INTRINSIC MOTIVATION AND SELF-DETERMINATION IN HUMAN BEHAVIOR* 43 (1985) [hereinafter DECI & RYAN, *INTRINSIC MOTIVATION*]. There is related controversy as to how and when regulation can crowd out intrinsic motivation. See, e.g., Barton H. Thompson, *What Good is Economics?*, 37 U.C. DAVIS L. REV. 175, 198–99 (2003).

132. See Richard M. Ryan & Edward L. Deci, *When Rewards Compete with Nature: The Undermining of Intrinsic Motivation and Self-Regulation*, in *INTRINSIC AND EXTRINSIC MOTIVATION* 13, 16 (2000) [hereinafter Ryan & Deci, *When Rewards Compete*].

133. See *id.* at 33–35.

134. See *id.* at 33.

135. Mark R. Lepper, *Motivational Considerations in the Study of Instruction*, 5 *COGNITION & INSTRUCTION* 289, 298 (1988).

136. DECI & RYAN, *INTRINSIC MOTIVATION*, *supra* note 131, at 43.

137. See GERALD T. GARDNER & PAUL C. STERN, *ENVIRONMENTAL PROBLEMS AND HUMAN BEHAVIOR* 116 (2002) (discussing concerns that incentives may reduce intrinsic motivation).

138. See, e.g., Holly Doremus, *Shaping the Future: The Dialectic of Law and Environmental Values*, 37 U.C. DAVIS L. REV. 233, 265–67 (2003); Thompson, *supra* note 131, at 198–99 (discussing how market mechanisms as well as command and control regulation may crowd out voluntary pro-environmental action if they are perceived as controlling behavior).

possesses some degree of intrinsic motivation a priori with respect to the action.¹³⁹ For example, debating whether compensation for sparing wolves reduces ranchers' intrinsic motivation to preserve the species is unhelpful—in most cases, no intrinsic motivation exists in the first place.¹⁴⁰ Intrinsic motivation also has a reduced impact on voluntary action when behavior is very costly because individuals are unlikely to engage in high-cost behaviors absent compensation (in these cases a decrease in intrinsic motivation may still affect compliance, attitudes, or voting choices).¹⁴¹ Last, crowding out occurs only when the incentive is tangible (i.e., money, coupons, prizes); social reinforcement such as praise or recognition does not decrease intrinsic motivation.¹⁴²

For the subset of participants who are vulnerable to crowding out, incentive programs can minimize these effects through the structure of compensation and administration. Monetary rewards depress intrinsic motivation by reducing self-determination (i.e., ability to freely choose to engage in a given action) and self-esteem.¹⁴³ Rewards are most likely to crowd out intrinsic motivation when they are “controlling,” meaning that the recipient experiences the reward as pressuring or coercing her actions or controlling the manner, time, or place of the activity.¹⁴⁴ When an incentive is controlling, an individual is likely to attribute her actions to the reward and to feel inconsistent or “overjustified” if she maintains her intrinsic motivation.¹⁴⁵ Monetary rewards are at particular risk of crowding out intrinsic motivation when they are disproportionately high relative to the task or behavior.¹⁴⁶ For example, an individual who receives a \$100 reward for recycling her newspapers each month is unlikely to attribute her actions to intrinsic motivation because the reward looms large as a motivator.

Rewards that impart positive information on performance and acknowledge participants' competence or altruistic motivations are perceived as

139. See Edward L. Deci et al., *A Meta-Analytic Review of Experiments Examining the Effects of Extrinsic Rewards on Intrinsic Motivation*, 125 *PSYCHOL. BULL.* 627, 633 (1999).

140. Indeed, nonprofit groups such as Defenders of Wildlife have had notable success in compensating farmers for livestock killed by wolves. See Defenders of Wildlife, The Bailey Wildlife Foundation Wolf Compensation Trust Payments, <http://www.defenders.org/wolfcomp.html> (last visited Sept. 12, 2006).

141. See BRUNO S. FREY, *NOT JUST FOR THE MONEY: AN ECONOMIC THEORY OF PERSONAL MOTIVATION* 60–63 (1997).

142. Ryan & Deci, *When Rewards Compete*, *supra* note 132, at 22–25.

143. Bruno Frey describes how extrinsic rewards decrease intrinsic motivation by impairing either self-determination or self-esteem. FREY, *supra* note 131, at 55–56; Yochai Benkler, *Sharing Nicely: On Shareable Goods and the Emergence of Sharing as a Modality of Economic Production*, 114 *YALE L.J.* 273, 325 (2004).

144. See Richard M. Ryan et al., *Relation of Reward Contingency and Interpersonal Context to Intrinsic Motivation: A Review and Test Using Cognitive Evaluation Theory*, 45 *J. PERSONALITY & SOC. PSYCHOL.* 736, 738 (1983).

145. FREY, *supra* note 131, at 56.

146. See Harvey S. James, *Why Did You Do That? An Economic Examination of the Effect of Extrinsic Compensation on Intrinsic Motivation and Performance*, 26 *J. ECON. PSYCHOL.* 549, 552–54 (2005).

“supportive” of action.¹⁴⁷ Supportive rewards increase self-esteem and self-determination, which in turn bolster intrinsic motivation.¹⁴⁸ The research indicates that rewards based on performing well either have no undermining effect or a much smaller undermining effect than rewards for merely engaging in a behavior.¹⁴⁹ A reward structure that makes external, third-party evaluation highly salient increases the risk of crowding out; a reward for good performance mitigates this effect by providing positive information on performance and symbolic value as a tangible acknowledgement of competency.¹⁵⁰

The manner in which a reward is administered also affects intrinsic motivation. Research has shown that threats, high-pressure evaluation, intensive surveillance, and deadlines can reduce intrinsic motivation.¹⁵¹ For example, in one experiment, subjects in a “controlling feedback” group were told that they “should try as hard as possible because [the experimenter] expected them to perform up to standards” in order to receive a reward.¹⁵² Following each task, subjects received feedback stating, “you did very well on that [task], just as you should” and received the reward. A second “supportive feedback” group received instructions to “do as well as you can” and that if they did “well” they would receive a reward.¹⁵³ The controlling feedback group showed decreased intrinsic motivation relative to the supportive feedback subjects.¹⁵⁴ In fact, the results indicated that performance-contingent rewards that are administered in a supportive or informational manner can actually increase intrinsic motivation compared to a no-reward/no-feedback condition.¹⁵⁵

The research on intrinsic motivation conveys an important warning to environmental policymakers: Disproportionate incentives and heavy-handed administration can decrease an individual’s motivation to engage in pro-environmental behavior. In recent years, Congress has been grappling with

147. See Bruno S. Frey & Reto Jegen, *Motivation Crowding Theory*, 15 J. ECON. SURVS. 589, 594 (2001).

148. FREY, *supra* note 131, at 56.

149. Judith M. Harackiewicz, George Manderlink, & Carol Sansone, *Rewarding Pinball Wizardry: Effects of Evaluation and Cue Value on Intrinsic Interest*, 47 J. PERSONALITY & SOC. PSYCHOL. 287, 298–99 (1984).

150. *Id.* at 295–300.

151. See Edward L. Deci & Richard M. Ryan, *The “What” and “Why” of Goal Pursuits: Human Needs and Self-Determination of Behavior*, 11 PSYCHOL. INQUIRY 227, 234 (2000) [hereinafter Deci & Ryan, *Goal Pursuits*].

152. See Richard Ryan et al., *Relation to Reward Contingency and Interpersonal Context to Intrinsic Motivation: A Review and Test Using Cognitive Evaluation Theory*, 45 J. PERSONALITY & SOC. PSYCHOL. 736 (1983).

153. See *id.* at 745.

154. The researchers noted that performance-contingent rewards can vary greatly in their impact on intrinsic motivation because they “can highlight either the information aspects or the controlling aspects . . . convey competency as well as pressure to different degrees depending on the interpersonal context of administration.” See *id.* at 748.

155. See *id.* at 748–49. The study referred to the supportive feedback condition as the “informational group.” There were additional subject groups who did not receive tangible rewards. See *id.*

controversies over financial incentives to private landowners.¹⁵⁶ The research on intrinsic motivation suggests that over-sized incentives or incentives administered in a top-down, controlling manner may be counterproductive.

III. APPLYING BEHAVIORAL SCIENCE TO CONSERVATION: PROPOSALS FOR INCREASING THE EFFICACY OF FINANCIAL INCENTIVES

This Part considers conservation incentives in light of the research on motivating widespread and durable behavioral change. Specifically, I examine the structure and efficacy of conservation easements and direct payment programs and offer three proposals for reform. To increase efficacy, conservation incentive programs should: 1) stagger payments to provide intermittent reinforcement; 2) structure incentive programs to preserve intrinsic motivation and avoid wasting resources; and 3) improve the marketing of incentives.

A. *Intermittent Reinforcement to Maintain Behavior*

A curious assumption that threads its way through many conservation tools and programs is that changes in landowner behavior will persist after incentives have ended. The upfront payment structure of many conservation incentives evidences an expectation, or at least implicit hope, that conservation behaviors will persist following the receipt of monetary incentives. Decades of psychology experiments have proven this assumption to be false. Behaviors disappear when an incentive is withdrawn unless the incentive is replaced with social rewards or the behavior is low-cost and repeated so frequently that it becomes a habit.¹⁵⁷ Indeed, this psychological phenomenon is so basic and deeply rooted that we view it as a common sense notion. Why then have many conservation incentives neglected this point? It may be that programs assumed that the voluntary nature of participation meant that landowners entered with pro-environmental attitudes, at least with respect to the particular conservation initiative. There is no reason to suppose this is true.¹⁵⁸ Moreover, research indicates that even if individuals have prior pro-environmental leanings it is unlikely that they will continue to engage in high-cost conservation behaviors absent an ongoing reward.¹⁵⁹

There are a number of options for providing ongoing reinforcement in direct payment programs and perpetual conservation easements. The need to provide ongoing financial reinforcement can make incentives an expensive option. Policymakers must consider the full cost of behavior maintenance in their decision calculus for regulatory versus incentive approaches. When incentives are the most

156. For example, there has been ongoing debate over large payments to farmers under the Conservation Reserve Program as well as controversy over anecdotal reports of overvaluation of conservation easement donations.

157. See *supra* Part II.B.2.

158. Recall that many program participants are farmers who often have a strong use orientation towards land or successive owners of easement-burdened homes who do not necessarily share the preservation values of the original easement donor.

159. See *supra* Part II.B.

cost-effective (or the only politically viable) option, staggered or intermittent reinforcement reduces the risk that initial conservation gains will be reversed by subsequent noncompliance.

1. Staggering Compensation for Direct Payment Programs

The goal of term easements, leases, and cost-share projects is to elicit ongoing conservation behaviors across significant periods of time. For example, habitat cost-share projects and term easements generally last a minimum of five to ten years, with some agreements lasting as long as thirty or even fifty years.¹⁶⁰ Most programs structure compensation so that it is received upon completion of the project or in installments throughout the project. A number of programs, however, deviate from this model and instead offer upfront payments either as a matter of policy or at the landowner's request. At the federal level, programs such as the Grassland Reserve offer upfront payment for thirty year easements that protect rangeland, pastureland, and shrub land by prohibiting the cultivation of crops other than hay.¹⁶¹ The Debt for Nature program offers immediate forgiveness of portions of farm loans for farmers who contract to limit use and development in the future.¹⁶² Other federal programs, such as the Wetlands Reserve, vary in their approach either paying the money in advance or staggering the payment over time at the landowner's option.¹⁶³ Certain state programs and local offices also emphasize advance payment, especially for term easements. For example, the Washington state riparian easement program compensates small forest owners upfront for the value of the timber placed under a fifty-year easement.¹⁶⁴ Similarly, the Chicago office administering the federal Partners for Wildlife program provides money or in-kind assistance at the outset and then works with landowners to implement the conservation project.¹⁶⁵

The psychological research demonstrates that incentives need to continue across the desired time span of the behavior. Incentive programs need to be

160. E.g., KEY POINTS: WETLANDS RESERVE PROGRAM, *supra* note 58; Small Forest Landowner Office, Wash. State Dep't of Natural Res., Forestry Riparian Easement Program (2004), <http://www.dnr.wa.gov/sflo/frep/>; Tenn. Wildlife Res. Agency, Conservation Programs To Improve Wildlife Habitat On Private Lands, <http://www.state.tn.us/twra/wildlife/conprowild.html> (last visited Sept. 23, 2006).

161. The Grassland Reserve Program offers both term (thirty-year) easements and permanent easements with permanent easements the favored option of the program. See FACT SHEET: GRASSLAND RESERVE PROGRAM, *supra* note 67.

162. Farm Serv. Agency, U.S. Dep't of Agric., Fact Sheet: Debt for Nature Program (2001), <http://www.fsa.usda.gov/pas/publications/facts/dfn01.pdf>.

163. In some programs, payments to landowners count as taxable income. This suggests that in these instances, not only is a staggered incentive program better for ensuring compliance, but landowners might actually prefer it.

164. Other state programs also use upfront payments. For example, the Illinois Partners for Wildlife Program offers the money in advance of the habitat restoration agreement.

165. Telephone Interview with Michael Redmer, Chicago Office of Partners for Fish and Wildlife, in Chi., Ill. (Feb. 8, 2006). The Chicago Partners for Wildlife Office described their cooperative approach and ongoing support of landowners as hallmarks of their program.

structured to provide ongoing incentives rather than frontloaded payments. Upfront compensation not only fails to reinforce behavior going forward, it also invites opportunism from participants to take the payment and then underperform. In contrast, dividing compensation into multiple installments reinforces and strengthens the conservation behavior. A staggered compensation system also redirects the landowner's attention to the conservation commitment and makes the behavior more salient. Designing direct payment programs to reward increments of behavior and demonstrated outcomes has the potential to increase behavior maintenance and decrease the cost of enforcement. This may be especially helpful for nonprofit organizations who, unlike the government, cannot directly garnish tax refunds and wages.

The model used in conservation banking to link payments to outcomes is instructive. Section 10 of the Endangered Species Act allows incidental takings of a listed species or its habitat if the Fish and Wildlife Service approves a habitat conservation plan ("HCP") that mitigates the damage to the species and ensures that the proposed action does not reduce its survival.¹⁶⁶ Conservation banking enables a landowner to meet her Section 10 obligations by purchasing credits from a bank that has preserved or enhanced that species' habitat elsewhere. Although the low demand for species-specific credits limits the reach of conservation banking, the banking program provides a model of thoughtful incentive design. The Fish and Wildlife Service awards conservation bank credits only upon successful completion of restoration or actual increases in habitat or population.¹⁶⁷ Typically, the credits accrue at the completion of each of multiple phases of conservation work. For example, the East Plum Creek Conservation Bank is a twenty-five-acre parcel owned by the Colorado Department of Transportation that protects the Preble's meadow jumping mouse.¹⁶⁸ The Department of Transportation receives credits based on each outcome it achieves, including placing the land under permanent conservation easement, meeting groundwater goals, restoring vegetation, and reaching population goals.¹⁶⁹ In this way, the conservation bank system rewards outcomes, reinforces increments of behavior, and provides incentives for future efforts.¹⁷⁰

166. See Endangered Species Act of 1973 § 10(a)(1)(B), (2)(A)–(B), 16 U.S.C. § 1539(a)(1)(B), (2)(A)–(B) (2000).

167. The Fish and Wildlife Service observed in its recent Guidance, "One way to increase the likelihood of success is to require some method of ensuring performance, such as authorizing sale of credits only upon completion and verification of restoration outcomes." Memorandum from the Director, Fish and Wildlife Serv., U.S. Dep't of the Interior, Guidance for the Establishment, Use, and Operation of Conservation Banks 7–8 (May 2, 2003), available at <http://www.fws.gov/Endangered/policies/conservation-banking.pdf>.

168. Marybeth Bauer et al., *Landowners Bank on Conservation: The U.S. Fish and Wildlife Service's Guidance on Conservation Banking*, 34 ENVTL. L. REP. 10,717, 10,721 (2004).

169. *Id.*

170. Unfortunately, there are relatively few conservation banks in the United States and the market for bank credits remains limited because the credits are species-specific. It seems that conservation banks may make their biggest impact not with their

Conservation banking provides a prototype for direct payment programs, especially those programs that distribute all or most of the compensation to landowners upfront. Direct payment programs could apply this model by providing compensation in installments based on completion of specific outcomes. For example, in a program designed to provide incentives for wildlife preservation a landowner would receive periodic payments based on acreage placed under a conservation contract or easement, grassland planted, and wildlife population increases. Landowners could still receive some portion of the money in advance as an initial incentive and to fund the beginning stages of a project; the balance of the compensation would be paid only when the landowner achieves predetermined outcomes. In cases where reductions are difficult to attribute to an individual source, such as nonpoint pollution and soil erosion, a goal-oriented reward system could focus on implementation of a given practice (e.g., installing wind breaks or using certain tillage practices) rather than achieving a specific outcome. Programs could also make unexpected "bonus" payments to landowners for compliance or superior performance. Recall that providing rewards unexpectedly rather than on a set schedule is more effective for increasing target behaviors.¹⁷¹ Incentive programs cannot meet the cash flow needs of farmers and ranchers if all compensation is sporadic and unexpected, but they may be able to provide a portion of total compensation on a variable schedule.

In a staggered compensation system, a landowner who delays action or fails to achieve a specified outcome does not receive an installment incentive payment. Depending on the subjective perceptions and entitlement expectations of the landowner, failure to receive a payment may be perceived as the status quo (landowner feels she did not receive a reward but did not experience a loss either) or as a punishment (withdrawal of an anticipated payment that the landowner felt entitled to receive). Even when a landowner views failure to receive compensation as a punishment, a staggered compensation system still provides behavioral reinforcement. Both rewards and punishments serve to reinforce and shape behavior.¹⁷² While rewards are preferable because they do not alienate or anger landowners, punishment also produces behavior change. Moreover, incentives are less demoralizing on the whole than regulation. Traditional regulation is punitive in tone, whereas in the typical incentive program most participants are compliant and receive positive reinforcement in the form of rewards.

In the absence of intermittent financial rewards, personal interaction between administrators and landowners may be able to provide ongoing reinforcement. Close relationships with landowners safeguard against noncompliance by creating nonmonetary reinforcement and emphasizing the landowner's personal commitment to fulfill the project.¹⁷³ In addition, programs that invest heavily in education and have frequent interaction with landowners are

success in creating trading markets but rather as a model for other incentive programs of careful, science-based program design.

171. See *supra* Part II.B.2.

172. See SKINNER, *supra* note 99, at 21 (developing a theory that punishment or reward following an action affects the frequency of the target behavior and over time creates a learned response).

173. See *infra* Part III.B.2.

engaging in a continual monitoring process that discourages violations. For example, the administrators of the Washington Riparian Forest Easement program spend an entire year educating potential participants and completing a multi-step contracting process.¹⁷⁴ In other programs, such as local offices of Partners for Wildlife, administrators meet regularly with participants and work directly with them to implement projects. Unfortunately, intensive one-on-one interaction is costly and beyond the resources of many programs. In cases where ongoing personal contact is not feasible, providing financial incentives in installments based on the completion of specific conservation behaviors is particularly critical.

2. Ongoing Reinforcement for Conservation Easements

The true value of a conservation easement is not solely the donation but also the long-term, indeed perpetual, maintenance of the terms of the easement. There is growing concern that subsequent owners, who may not share the environmental motivations of the original donor, will have higher rates of noncompliance in the years to come.¹⁷⁵ New owners typically benefit from a reduced purchase price due to the easement, but they often lack adequate incentives going forward to remind them of their obligations and motivate compliance.¹⁷⁶ Policymakers and land trusts need to consider ways to provide ongoing reinforcement for successive owners of easement-encumbered property.¹⁷⁷

One response might be for states to implement or expand laws requiring annual property tax reductions for owners of easement-encumbered land. A property tax reduction, especially one that is prominently itemized on tax bills, serves as a yearly reminder and makes the easement more salient to the landowner. Although easements typically decrease the value of land, localities vary in whether or not they give landowners a corresponding property tax reduction.¹⁷⁸ In states that lack legislation compelling property tax reductions, local assessors concerned about maintaining the tax base may fail to provide or maintain significant property

174. Similarly, the Illinois Partners for Wildlife program is heavily involved in working with the landowner in all stages to implement the conservation project. Telephone Interview with Michael Redmer, *supra* note 165. The Chicago Partners for Wildlife Office described their cooperative approach and ongoing support of landowners as hallmarks of their program. *Id.*

175. A lower purchase price for easement-encumbered land certainly acts as a reward; however, it does not provide continuing reinforcement going forward for complying with easement terms.

176. There is significant variation in whether, or to what extent, owners of easement-encumbered land benefit from property tax reductions. *See* Parker, *supra* note 79, at 495–96.

177. Interestingly, a change in the law for donations made in 2006 and 2007 may provide better reinforcement to original donors by allowing donors to carry forward their federal income tax deduction for fifteen years following the tax year that they donated the easement. *See* Pension Protection Act of 2006, Pub. L. No. 109-280, § 1206(a)(1), 120 Stat. 780 (2006). Previously, the carry-forward period was five years. The expansion of the carry-forward period to fifteen years has the potential to reward donors across a longer period of time and provide an annual reminder that redirects their attention to their conservation obligations.

178. Parker, *supra* note 79, at 495–96.

tax reductions to owners of easement-encumbered land.¹⁷⁹ New York recently adopted an innovative tax law that allows landowners of easement-encumbered land to receive an income tax credit of 25% of their annual property tax up to a maximum of \$5000 per year.¹⁸⁰ This law avoids resistance from localities because the tax credit is applied to the state income tax and therefore does not reduce local property tax revenues. The Land Trust Alliance lobbied extensively for this law, noting the need for a “powerful motivator . . . [that] ensures that new owners, too, will comply with their easements.”¹⁸¹ Tax reforms such as the New York act encourage compliance by reinforcing conservation behaviors and reminding new owners of their easement obligations.¹⁸²

Another option is to provide nonmonetary reinforcement for landowners through commitment strategies and recognition programs. Psychology research shows that making a voluntary commitment significantly increases the likelihood that individuals will maintain pro-environmental behaviors over time.¹⁸³ This effect is especially strong when the commitment is public rather than private and is expressed in writing.¹⁸⁴ Land trusts could integrate commitments into their practices by asking new owners to sign pledges that reflect their intention to act as responsible stewards. This pledge should be framed as a positive, voluntary recognition of the owner’s civic-mindedness and attachment to her land, not a legal contract. It should emphasize the owner’s personal commitment to work in partnership with the land trust. Commitments may work particularly well with

179. Over a dozen states already have statutes in place requiring local assessors to reduce property value assessments for tax purposes, although generally these laws provide no guidelines or requirements for the extent of the reduction or the valuation method. *See* John L. Hollingshead, *Conservation Easements: A Flexible Tool for Land Preservation*, 3 ENVTL. L. 319, 359–60 (1997).

180. *See* N.Y. TAX LAW § 606(kk) (McKinney 2006).

181. The Land Trust Alliance supported this legislation because of the potential for it to increase compliance as well as to encourage landowners of modest means to donate conservation easements. *See* Land Trust Alliance, *New York State Enacts a First-In-The-Nation Tax Credit for Conservation Easements* (May 4, 2006), http://www.lta.org/newsroom/nys_ce_credit.html.

182. As with direct payment incentives, an owner of easement-encumbered land who loses her property tax reduction due to noncompliance will likely feel penalized. Although rewards are preferable in order to avoid demoralization, both punishments and rewards can motivate and reinforce behavior. Because the majority of landowners comply with their easements, we can expect that most owners of easement-encumbered land will experience tax reforms as an ongoing reward for compliance.

183. There is no research on the use of commitment strategies for high-cost activities (e.g., commuting by bus rather than car or not developing potentially profitable areas of land). Given the finding that attitudes do not translate into behavior when costs are high, it seems unlikely that commitment will create consonant action in these circumstances. *See generally* Lehman & Geller, *supra* note 98, at 20 (describing experiments using personal commitment to motivate environmental behaviors such as recycling); *see also* Pallak et al., *supra* note 128, at 248–49 (participants in a household energy conservation project who agreed to have their names appear on a published list reduced energy use significantly more than controls).

184. *See* Anton U. Pardini & Richard D. Katzev, *The Effect of Strength of Commitment on Newspaper Recycling*, 13 J. ENVTL. SYS. 251–52 (1983–1984).

conservation easements on non-working lands (i.e., homes, retreats, and estates) where owners often value the undeveloped quality of their land and are more likely to identify with the environmental movement. Land trusts should also increase their use of recognition programs, particularly in communities where norms favor conservation.¹⁸⁵ For example, land trusts could create and publicize lists of “conservation stewards” in local papers as a means of recognizing new owners of easement-encumbered land. Social rewards such as plaques, certificates, or awards similarly reinforce conservation behavior and encourage long-term compliance.

In addition to positive reinforcement, land trusts can invest more heavily in enforcement efforts with an eye to halting actual violations as well as deterring would-be violators. Most land trusts recognize the increased risk for violations as land passes from original donors to new owners and are concerned about enforcing the easements they hold. The Land Trust Alliance recently created a voluntary accreditation program¹⁸⁶ that requires that land trusts provide, or at least plan to secure, funding for enforcement costs.¹⁸⁷ Some commentators have also argued for expanding standing to allow private citizens or other non-profit organizations to bring suit to remedy violations.¹⁸⁸

If compliance becomes a more drastic problem in the future and ongoing rewards or enforcement efforts prove too costly, this might suggest increased use of limited-term contracting. Limited-term contracts make it easier to tie payments to results and reduce enforcement costs by remedying violations with nonrenewal rather than litigation. Recently, there has been increasing scholarly attention to the use of terminable “annuity” easements or call options that allow easement holders and landowners to extinguish easements based on payment of a pre-determined price.¹⁸⁹ The comparative efficiency of a contracting approach versus a permanent easement depends on the present value of the stream of payments relative to the lump sum compensation for the perpetual easement, as well as the risk of future

185. Approximately 40% of the states offer some type of recognition program. For example, the Kentucky Natural Areas registry provides recognition for ecologically important lands and the Colorado Division of Wildlife names a Landowner of the Year to recognize owners who improve wildlife habitat or provide public access. George, *supra* note 61, at 9. Some nonprofit organizations give annual prizes to recognize outstanding conservation efforts. For example, the American Farmland Trust has a “Steward of the Year Prize” that is given to a farmer to recognize his or her commitment to land stewardship. American Farmland Trust, AFT’s \$10,000 Steward of the Land Award, <http://www.farmland.org/programs/award/default.asp> (last visited Sept. 12, 2006).

186. Land Trust Alliance, Accreditation, (2006), <http://lta.org/accreditation/>.

187. LAND TRUST ALLIANCE, LAND TRUST STANDARDS AND PRACTICES 6 (2004), available at http://www.lta.org/sp/land_trust_standards_and_practices.pdf.

188. Brown, *supra* note 90, at 87.

189. Christopher Elmendorf has considered the use of a terminable annuity easement where the holder can resell the easement to the landowner for the price of the annuity that was paid for it initially. Christopher S. Elmendorf, *Securing Ecological Investments on Other People’s Land: A Transaction Costs Perspective*, 44 NAT. RESOURCES J. 529, 553 (2004). Lee Fennell has suggested attaching a “running call option” to permanent conservation easements. Lee Fennell, *Revealing Options*, 118 HARV. L. REV. 1399, 1479 (2005).

landowner holdout problems in re-contracting large, assembled reserves.¹⁹⁰ When permanent easements rather than contracts are the tool of choice, successive owners are more likely to maintain conservation behaviors with ongoing financial rewards, social reinforcement, the threat of enforcement, or, most powerfully, a combination of these strategies.

B. Safeguarding Intrinsic Motivation: Restructuring Compensation and Administration

A threshold concern for conservation incentive programs is whether rewards will crowd out intrinsic motivation for voluntary stewardship and, if so, how to minimize this effect. Crowding out can reduce the strength of a participant's behavioral response and weaken long-term compliance. Individuals who were already engaging in a behavior prior to receiving financial compensation are less likely to do so once the incentive expires.¹⁹¹ This effect is particularly relevant to low-cost, convenient environmental behaviors—the type of behavior where attitudes are most likely to prompt action absent compensation. Crowding out can also increase expectations that conservation activities require compensation, encouraging individuals to oppose regulation that is not compensation-based or undermining pro-environmental attitudes generally.

It is important to note that for a significant subset of incentive-program participants, intrinsic motivation is not at issue. In order to suffer a reduction of intrinsic motivation, a landowner must have some degree of positive inclination or interest in the behavior *ex ante*. This point is underappreciated by commentators objecting to the commodification of environmental values from financial incentives.¹⁹² A person who views wetlands as a swampy detriment and distrusts claims of their ecosystem benefits is not going to experience a decrease in intrinsic motivation if she is paid to restore her wetland property. These situations are a paradigm case for using monetary incentives without the fear of negative effects on motivation or attitude. In contrast, most farmers and ranchers have significant *ex ante* interest in activities that preserve the health of working lands while owners of recreational nature retreats are often motivated to preserve wildlife and open

190. Christopher Elmendorf has argued that perpetual easements are not automatically less costly and has advocated an economic analysis based on the present value of a perpetual stream of payments versus a lump sum payment. *See* Elmendorf, *supra* note 189, at 552–54. Perpetual easements are likely to be less costly when, as is often the case, there are potential holdout problems caused by land assembly or site-specific investments in restoration.

191. For some conservation programs, prior activities make a landowner ineligible (e.g., a program providing fencing cost-share assistance would exclude a landowner who has already fenced their land). But in many other programs, such as those involving wetlands incentives, individuals are eligible for compensation for protecting habitats that they have already conserved, at least in the sense that the individual has not developed the land. *See* KEY POINTS: WETLANDS RESERVE PROGRAM, *supra* note 58 (describing permanent and term easements to protect wetlands on working lands).

192. *See, e.g.,* Doremus, *supra* note 138, at 265–67 (urging care in using market strategies in a way that “conflict[s] with general conservation obligations that we want society to internalize”).

space. In these cases, careful design of incentives and program administration can reduce the risk of crowding out and preserve intrinsic motivation.

Where a rewarded landowner's intrinsic motivation is at risk, adjusting the size of incentives and the style of program administration can mitigate crowding out effects.¹⁹³ To safeguard intrinsic motivation, programs need to create compensation systems that participants perceive as supportive of their behavior rather than controlling. Specifically, psychological research shows an increased risk of crowding out when compensation is not proportionate to effort or performance and administration is high-pressure, top-down, or negative in tenor.

1. Rightsizing Excessive Financial Incentives

The research indicates that one way to mitigate negative effects on intrinsic motivation is to avoid rewards that are disproportionate and not tied to the quality of performance.¹⁹⁴ Participants perceive oversized incentives as controlling their conservation behaviors: They are acting in order to garner the incentive. In contrast, more moderate or proportional incentives support or enable conservation behavior by making it financially feasible for landowners to act on their positive sentiments for their land. As one researcher observed, "[R]eward size is negatively related to intrinsic motivation The reason is that the processes by which an agent rationalizes his behavior may become so overwhelmed by the salience (e.g., size) of extrinsic rewards that he is rationally compelled to attribute his behavior to the compensation rather than to his intrinsic preferences."¹⁹⁵ Research on minimal justification theory shows that moderate interventions influence behavior more than unnecessarily strong interventions.¹⁹⁶ With small or moderate rewards the subject perceives that her actions are prompted by internal forces rather than external rewards and this promotes greater behavioral change.

In certain circumstances, participants in conservation programs receive disproportionate or oversized incentives. For example, tax deductions for conservation easements may provide a subset of landowners with outsized rewards due to overvaluation of their donated interests or the cumulative effect of state and federal credits. Many conservation easement donations appear to be motivated at least in part by the donor's personal attachment to her land and desire to conserve

193. The experimental research has not clearly established the effect of engaging in a voluntary activity only to find that others who have not acted so virtuously are now receiving rewards to do so. The empirical evidence is mixed, and at least some studies have found that individuals continue to act voluntarily. A definitive answer to the question of how rewards influence individuals who do not receive them awaits continued empirical study and differentiation in specific incentive contexts. *See, e.g.*, Salzman, *supra* note 6, at 945–46 (2005) (noting that farmers are unlikely to abandon voluntary farming practices that increase land health in order to qualify for an incentive because the costs to their land of discontinuing the practice are generally greater than the value of the incentive).

194. *See supra* Part II.B.3.

195. *See* James, *supra* note 146, at 553.

196. *See* M.R. Lepper, *Social Control Processes and the Internalization of Social Values: An Attributional Perspective*, in *SOCIAL COGNITION AND SOCIAL DEVELOPMENT* 296–97 (E. Tory Higgins et al. eds., 1983).

it in perpetuity.¹⁹⁷ While most donors provide appropriate valuations, there is a concern that some landowners are submitting inflated easement values.¹⁹⁸ Appraisers may unintentionally overvalue easements due to the limited number of past easements donations available for comparison. There have been anecdotal reports of intentional overvaluation. Concern over valuation abuse prompted recent legislative reforms imposing stricter standards and penalties for misstatements of value and incorrect appraisals.¹⁹⁹ Easement donors may also receive excessive incentive compensation (i.e., a greater amount of tax savings than is necessary to motivate the easement donation) if they are residents of states, such as Virginia and Colorado, where they are eligible for generous state income tax credits in addition to federal tax incentives.²⁰⁰ When the tax savings are disproportionate to the landowner's opportunity cost for preserving the land or the amount the landowner would have demanded to sell the easement, there is a risk of undermining intrinsic motivation. Crowding out of intrinsic motivation may reduce voluntary compliance with easement terms by initial owners or discourage these individuals from voluntarily undertaking other types of conservation activities.

Direct payment programs to farmers are also vulnerable to excessive compensation.²⁰¹ Programs that provide substantial compensation yet impose only limited stewardship requirements are likely to crowd out intrinsic motivation for those landowners who possessed *ex ante* motivation. Commentators have criticized certain incentive programs, such as the Conservation Reserve Program, for providing disproportionately large subsidies to farmers.²⁰² Interestingly, other programs have achieved significant outcomes using fairly modest payments. For example, a grass-roots conservation leasing program created by the North Carolina Herpetological Society to protect the bog turtle has successfully enrolled

197. Nancy McLaughlin, *Increasing the Tax Incentives for Conservation Easement Donations: A Responsible Approach*, 31 *ECOLOGY L.Q.* 1, 41–47 (2004) [hereinafter McLaughlin, *Increasing the Tax Incentives*] (discussing surveys of the motivation of easement donors which indicate that strong personal attachment to their land and concerns about long-term stewardship of their land is the primary factor motivating their donations).

198. To date, there has not been empirical evidence documenting the level or extent of valuation abuse. There have been anecdotal reports of abuse, *see, e.g.*, Stephens & Ottaway, *supra* note 80, and these concerns prompted the IRS's recent move towards more aggressive investigation of easement donations. *See* Steven T. Miller, Comm'r, Tax Exempt and Gov't Entities Div., Internal Revenue Serv., Remarks at the Spring Public Lands Conference (Mar. 28, 2006), *available at* http://www.lta.org/publicpolicy/irs_miller_032806.htm.

199. *See* Pension Protection Act of 2006, Pub. L. No. 109-280, § 1219, 120 Stat. 780 (codified at 26 U.S.C. § 6695A (2000)).

200. McLaughlin, *Increasing the Tax Incentives*, *supra* note 197, at 98–105 (discussing the interaction between state and federal tax incentives and the potential for windfall tax savings to donors from states with generous conservation easement tax credits).

201. The Conservation Reserve Program has been criticized for its excessive compensation with critics noting that it is not cost-effective. FAIRFAX ET AL., *supra* note 86, at 271 (“[S]ome of these leases under the Conservation Reserve Program violate our first principle of seeking a good bargain; payments over the life of the lease sometimes approach or surpass the full value of the land itself.”).

202. *See id.*

landowners in one-year renewable contracts that restrict cattle from nesting areas and prohibit landowners from draining bogs.²⁰³ The payments to each landowner can be as low as \$20 per acre per year²⁰⁴ and are frequently significantly less than the typical per acre payment under the major federal leasing programs. Since its inception ten years ago, the Herpetological Society has entered into agreements protecting 240 acres of land and all participants have renewed their agreements.²⁰⁵ This result may be due to the fact that these landowners never planned to develop their bogs anyway. However, the same could be true for many landowners who receive larger payments from federal wetlands programs.

To mitigate crowding out effects, incentive programs should make payments proportional to behavioral costs and performance. One option is to reduce or cap the compensation for easements or conservation leases.²⁰⁶ Across-the-board caps are likely too blunt an instrument for motivating landowners with varying attitudes towards conservation and abilities to benefit from tax incentives. A better approach is to tighten the link between landowner effort, public benefits, and compensation. For example, the IRS could structure the tax deduction for conservation easements to provide larger rewards to the most ecologically valuable and effortful actions. An easement that preserved open space with limited ecological value might receive a much smaller deduction than an easement that protected rare habitat or land that provided valuable ecosystem services.²⁰⁷ The evolving nature and uncertainties of ecological science make differentiation challenging, but not impossible.²⁰⁸ Metrics for valuing land and conservation exist in current programs, such as the Environmental Benefits Index used to select participants for the Conservation Reserve Program. There is also widespread agreement in the scientific community on certain ecological principles, such as the importance of large, contiguous parcels and adaptive management.²⁰⁹ Basing payments on an environmental benefits scale or a graduated system for active versus passive management would make compensation more proportionate and

203. Margaret McMillan, *Envtl. Def., Bog Turtles Make New Friends: Landowners and Livestock* (May 27, 2004), <http://www.environmentaldefense.org/article.cfm?contentid=4509>.

204. Dennis W. Herman, *Project Bog Turtle: A Conservation Initiative in Action*, http://www.tortoisereserve.org/Research/Bog_Turtle_Report/Bogturtlefinalreport_14-16.pdf (last visited Sept. 27, 2006) (noting that payments range from \$20–\$50 per acre).

205. *See id.*

206. For example, a Joint Committee on Taxation report recommended limiting deductions to 33% of an easement's appraised value. *See* STAFF OF JOINT COMM. ON TAXATION, 109TH CONG., JCS-02-05, *OPTIONS TO IMPROVE TAX COMPLIANCE AND REFORM TAX EXPENDITURES 283* (2005), available at <http://www.house.gov/jct/s-2-05.pdf>.

207. Setting up varying levels or tiers of tax incentives for easements would require consultation with ecologists and conservation biologists as well as public comment to determine a ranking system.

208. *See* FAIRFAX ET AL., *supra* note 86, at 265 (“[Biologists] have only just begun to identify standards for designing nature preserves, determining habitat requirements for protected species, and estimating the impacts of different human uses on ecological sustainability.”).

209. *See supra* Part I.B.

increase the likelihood that participants perceive incentives as supporting, rather than controlling, behavior.

Another option is to use competitive bidding to award compensation. In competitive bidding, landowners submit bids stating the amount of compensation required to elicit their participation, allowing programs to select the most cost-effective projects. From a behavioral standpoint, competitive bidding reduces oversized incentives which in turn safeguards against the undermining of nonmonetary motivations.²¹⁰ Bidding elicits subjective valuations, providing information about the costs of conservation to different landowners, while avoiding the inefficiencies of third-party determination of compensation. Competitive bidding also enhances efficiency because applications can be ranked on cost relative to environmental benefits.²¹¹ One government report estimated that competitive bidding for enrollment could stretch budgets and increase net environmental benefits by 25%.²¹² The Conservation Reserve Program has reduced payment amounts from pre-bidding program years, although in some cases the effects have been limited by very high acceptance rates for enrolled acreage or landowner knowledge of bid thresholds. Other government and nonprofit conservation programs could reduce disproportionate or excessive compensation by adding a bidding element to their selection process. The winning bids could be chosen based on a weighted measure of ecological sensitivity of the land and the amount of the bid. Or, applicants could bid competitively based on the cost-share rate (i.e., the percentage the landowner contributes to project expenses).²¹³ Reforms in participant selection and compensation, such as bidding systems and other forms of differentiated compensation, protect intrinsic motivation by increasing the proportionality between conservation behaviors and rewards.

2. The Importance of Framing Feedback to Emphasize Achievement and Autonomy

The psychology research shows that rewards administered in a manner that highlights positive performance feedback and voluntary choice are best able to motivate behavior change.²¹⁴ Intrinsic motivation suffers if the reward is given in such a way that it suggests that the administrator mistrusts the participant, undervalues her intrinsic motivation or environmental ethics, or believes she did a

210. This reform would be most helpful if there was a streamlining of the current mishmash of federal incentive programs to control and coordinate total payments from all government programs to individual landowners.

211. See Salzman, *supra* note 6, at 892–96 (describing the efficiency advantages of Australia’s competitive bidding pilot program, BushTender).

212. CATTANEO ET AL., *supra* note 94, at iv.

213. Federal conservation programs generally do not offer bidding by cost-share, although some, such as the federal Wildlife Habitat Incentives Program, do award higher levels of cost-share assistance to landowners who commit to agreements for longer periods of time. NATURAL RES. CONSERVATION SERV., U.S. DEP’T OF AGRIC., PROGRAM DESCRIPTION: WILDLIFE HABITAT INCENTIVES PROGRAM 2 (2004), <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/WHIPPrDs.pdf>.

214. Harackiewicz, Manderlink, & Sansone, *supra* note 149, at 295–300.

poor job.²¹⁵ In these cases, compensation is likely to depress intrinsic motivation.²¹⁶ In order to avoid these effects, conservation programs need to avoid high-pressure tactics, create achievable targets, and provide positive feedback.

From a behavioral standpoint, effective programs set goals that are attainable by the majority of participants and then provide positive performance feedback as those goals are met. Conservation programs that have unrealistic expectations for performance or that provide inadequate technical support run the risk of demoralizing landowners. Research has found that participants who fail at projects for which a performance-contingent reward was possible suffer large reductions in intrinsic motivation.²¹⁷ Programs can reduce the incidence of failure and negative feedback by breaking down large projects into stages, rewarding progress on an ongoing basis, and working closely with landowners. For conservation projects with a flexible timetable, administrators can reward landowners whenever they attain a goal or outcome rather than setting specific times for evaluating performance (and potentially providing negative feedback).

Incentive programs should also emphasize collaboration and partnership. Positive performance evaluations preserve intrinsic motivation, while high-pressure evaluations and intensive surveillance undermine it.²¹⁸ Administering conservation incentives in a positive, supportive way is challenging given program administrators' concerns of landowner cheating or shirking. The initial inclination of some administrators may be to over-emphasize evaluation and enforcement in a style similar to regulation. A lighter hand may be able to accomplish the same goals without impairing landowners' motivation. Here, the goal is not to eschew evaluation of landowner progress and practices, but rather to frame that evaluation to emphasize positive feedback and constructive assistance. Another way to enhance self-determination and self-esteem is for programs to provide payment for a specific outcome but allow the landowner to ascertain the best and cheapest means of achieving that goal. In addition to the motivational benefits, there are also efficiency gains in cases where owners of working lands have superior knowledge about their land or specialized expertise implementing conservation practices.²¹⁹

Some programs, such as the federal Wildlife Habitat Incentives Program, are designed to encourage landowner innovation and provide positive feedback.²²⁰ Regional staff members have ongoing, personal contact with landowners to provide support for implementing cost-share conservation projects. Other government programs, particularly large-scale agricultural initiatives, have not been as successful in infusing their administration with an encouraging and

215. FREY, *supra* note 131, at 55–57.

216. *See id.*

217. *See* Ryan & Deci, *When Rewards Compete*, *supra* note 132, at 28–29. Commenting on another study, Ryan & Deci concluded that “it is likely that at least some of them experienced the implicit feedback contained within the rewards as ‘negative.’” *Id.* at 28.

218. *See* Deci & Ryan, *Goal Pursuits*, *supra* note 151, at 234.

219. For example, conservation banking gives landowners freedom to select the methods used to achieve habitat and population outcomes. *See supra* Part I.C.

220. *See supra* Part II.B.3.

personalized tenor or in providing incentives for innovation.²²¹ This is due to the costliness of interactive styles of administration. Incentive programs thrive in an expensive medium of feedback, monitoring, and relationship-building. The resource-intensive nature of conservation incentive programs underscores the need to prioritize conservation goals and invest in projects likely to yield the largest ecological gains relative to cost.

The importance of administrative style and feedback is a strong argument (and certainly not the only one) for localizing the implementation of conservation incentives. Concerns about intrinsic motivation require administrators to think carefully about the attitudes and culture of their target participants. Incentive programs that are administered at the local level and involve landowners early in the process will have a better read on local attitudes and the likelihood of voluntary action. This is a strength of land trusts, most of which are grassroots initiatives with staff who are well-established in the community. Many state and federal programs have also localized the administration of incentive programs, creating regional offices or coordinating with local nature preservation districts. There is some risk that local programs may be more vulnerable to capture or cronyism, especially when programs emphasize ongoing contact and personal relationships. This risk can be managed through better selection procedures, such as competitive bidding and separating staff charged with participant selection from those who assist landowners with project implementation. In order to effectively promote conservation behavior and safeguard intrinsic motivation, local offices must have the latitude to fine-tune their programs to regional characteristics, emphasize personal contact, and vary the scale of incentives.

C. Social Marketing: Increasing Participation

Ensuring high levels of participation in conservation programs requires effective “social marketing” of incentives. Although government and nonprofit conservation incentive programs have expanded rapidly, there has not been a corresponding increase in their marketing efforts. A key reason that incentives have only moderate effects on net pro-environmental behavior is that people do not know about the incentive or understand the full benefits of participation.²²² Conservation programs need to invest more heavily in advertising incentives and recruiting landowners. Programs also need to use high-credibility sources to increase the persuasive impact of their marketing.

Conservation incentive programs elicit suboptimal numbers of applications when landowners are not aware of incentives or fail to attend to

221. For example, the Conservation Reserve leasing program (“CRP”) has less personal interaction with participants due to the size of the program and the nature of the leasing arrangements. In contrast, the Conservation Reserve Enhancement Program, an offshoot of CRP, focuses on targeted conservation projects and offers additional bonuses for certain high-priority practices. *See* Farm Serv. Agency, U.S. Dep’t of Agric., Conservation Reserve Enhancement Program: Questions & Answers, <http://www.fsa.usda.gov/dafp/cepd/crepqnas.htm> (last visited Sept. 13, 2006).

222. Pitts & Wittenbach, *supra* note 111, at 336.

them.²²³ For conservation programs with selective application processes, a large applicant pool allows administrators to choose more ecologically sensitive lands and cost-effective projects. To maximize landowner participation and conservation impact, incentive programs must devote greater resources to marketing. Effective marketing and recruitment has a ripple effect in local communities. Research on social diffusion shows that new practices and technologies spread as people follow the lead of their friends and neighbors.²²⁴ Identical incentive programs can have as much as a tenfold difference in success rates based on nonfinancial factors, the most important of which include the quality of marketing and the resulting social diffusion.²²⁵ Researchers have found that, rather than increasing the size of already substantial financial incentives, a more effective route is to increase investment in advertising and marketing.²²⁶ This has interesting applications to conservation easements and other direct payment programs that provide significant compensation to landowners. It may be that improving marketing efforts is more valuable than increasing the size of tax deductions or subsidies.

Conservation incentive programs need to increase not only the amount, but also the sophistication of their marketing. Credibility and perceived motivation of the sponsoring organization strongly affect recruitment. This has been an issue for nonprofits and land trusts based in communities that are distrustful of environmentalism. The Wyoming Stock Growers Agricultural Land Trust (“WSGALT”) is one example of a thriving nonprofit that has built its organization on its credibility in ranching communities. WSGALT was founded by a ranchers’ association and focuses on protecting working lands through conservation easements. The land trust has addressed the unique concerns of ranchers by creating conservation easement awareness programs and informational sessions for ranchers. It publishes a quarterly column in the Wyoming Stock Growers Association’s *Cow Country* magazine about its activities and has created a national partnership of rangeland trusts.²²⁷ Owners of working lands, a group that has

223. The design of program application and enrollment also influences participation. Landowners who must go through multiple, time-consuming steps to participate are less likely to participate than those who can take advantage of a more streamlined process. Stern, *Blind Spots*, *supra* note 117, at 210–11 (study of energy incentive programs finding significant participation differences based on the number of steps required to enroll).

224. See, e.g., Paul C. Stern, *What Psychology Knows About Energy Conservation*, 47 AM. PSYCHOLOGIST 1224, 1229 (1992) [hereinafter Stern, *Energy Conservation*].

225. See Stern, *Blind Spots*, *supra* note 117, at 210–11; ENERGY USE: THE HUMAN DIMENSION 80–82 (Paul C. Stern & Elliot Aronson eds., 1984). One researcher noted that “[w]eak incentives have little effect regardless of nonfinancial factors; strong incentives have highly variable effects that depend on details of program implementation.” Stern, *Energy Conservation*, *supra* note 224, at 1229.

226. See GARDNER & STERN, *supra* note 137, 110–11.

227. Wyo. Stock Growers Agric. Land Trust, *What We Do* (2003), http://www.wsgalt.org/what_we_do.htm.

historically been distrustful of easements as a conservation tool,²²⁸ have increased donation of conservation easements as a result of WSGALT's efforts.

Most land trusts and conservation programs lack strong pre-existing ties with locally respected sources. Instead, they must actively seek to involve local landowners and citizen groups held in high esteem. People frequently judge desirability and credibility based not on an exhaustive examination of a program but rather on the proxy that a credible source is affiliated with the program.²²⁹ Hiring prominent local landowners for liaison work can dramatically increase program credibility.²³⁰ An alternative to hiring, particularly in cases where landowners are occupied full-time in farming and ranching pursuits, is to create volunteer advisory boards or citizen spokespeople. For example, land trusts have involved landowners by asking well-respected members of the community (often former easement donors) to serve on the board of directors or other committees and by publishing newsletters about local donors. Land trusts could further enhance their marketing efforts by increasing the role of former donors in the advertising and recruitment process (e.g., asking former donors to volunteer to describe their experience to landowners considering an easement). Employees at agricultural extension programs, which provide educational support to farmers, are typically highly regarded in rural communities and can play a similar role in publicizing direct payment programs.

In summary, many agencies and nonprofits have been slow to understand the value of marketing and to create effective marketing campaigns. To maximize conservation gains, incentive programs must increase both the amount and sophistication of their marketing efforts. Involving respected local landowners in decisionmaking as well as in publicizing incentives is a particularly effective way to increase participation.²³¹

CONCLUSION

When one holds conservation incentive programs under the magnifying glass, a complex administrative picture emerges. Incentive programs, like regulation, can suffer from problems of cost, efficacy, and enforcement.²³² Yet,

228. Erin Morrow, *The Environmental Front: Cultural Warfare in the West*, 25 J. LAND RESOURCES & ENVTL. L. 183, 232 (2005) (“[M]any private property owners and grassroots organizations have been skeptical of—or downright hostile to—conservation easements.”).

229. See generally NICKERSON, *supra* note 8, at 105 (describing research showing that an important determinant of the persuasiveness of a message is its source).

230. See Elmendorf, *supra* note 1, at 468 (emphasizing the importance of positive relations between landowners and environmental groups and noting that “[i]f respected or typical landowners collaborate with the environmentalist, others are likely to follow.”).

231. There has been a great deal of discussion recently about involving local citizens as “stakeholders.” See, e.g., Robert B. McKinstry, Jr., *Effective Strategy for Addressing Global Biodiversity Issues Locally: A Synthesis*, in ALI-ABA COURSE OF STUDY 360 (2005), available at SK056 ALI-ABA 341, 345 (Westlaw).

232. When information costs are low, such that the government or a nonprofit can readily determine the ecological value of land, targeted regulation may be more cost-effective than incentives. See Salzman, *supra* note 6, at 920–21. Douglas Williams’s recent

incentives have comparative advantages over traditional command and control regulation. Incentives are able to promote the type of active management that is so important to wildlife and habitat conservation. Well-structured incentives can motivate owners of ecologically valuable land to identify themselves and encourage innovation in stewardship practices. Politically, incentives can be an important step towards improving the strained relationships between environmentalists and certain landowner groups.²³³

As conservation incentive programs continue on their rapid growth trajectory, it is important to step back and reconsider incentive design in light of the research on behavior change. This Article suggests ways to increase the efficacy of conservation incentive programs and minimize enforcement costs. Specifically, this Article offers three proposals for improving conservation incentives: 1) staggering payments to provide intermittent reinforcement; 2) restructuring incentives and program administration to safeguard intrinsic motivation; and 3) enhancing marketing to increase participation. These proposals have the potential to increase the rate and durability of behavior change and to make conservation incentive programs more cost-efficient.

This analysis suggests an important role for incentives on private land, but not an exclusive one.²³⁴ Regulation can provide a context for incentives, define the parameters of market-based strategies, and complement incentive programs.²³⁵ Regulation, or more specifically, relief from regulation, can create the infrastructure for incentive programs, as is the case with conservation banking credits used to secure Habitat Conservation Plan waivers from the Endangered Species Act.²³⁶ Often, a combination of regulation and incentives is necessary to address different practices or aspects of a multi-faceted problem, such as nonpoint pollution. The task for the future is to conceptualize more sophisticated ways to combine regulation and incentives into hybrid programs that can tailor solutions to complex conservation problems and address the varying needs and values of landowners.²³⁷

work examines how incentives have failed to adequately address the problem of agricultural nonpoint source water pollution and argues for a mixture of policy tools that emphasize stronger legislative and regulatory prohibitions on pollution. *See Williams, supra* note 46, at 23–25.

233. *See Elmendorf, supra* note 1, at 425–26.

234. For example, pricing, where prices of goods account for environmental harms, has great potential to shape behavior in a widespread and ongoing manner, but is not politically viable in the United States in the foreseeable future. Pricing also has its own complications in terms of determining the value of harms, particularly harms to other species and future generations.

235. *See Clark & Downes, supra* note 105, at 87 (noting role of regulation in “defining the context within which market mechanisms operate and to provide a baseline of protection in situations where market incentives are not strong enough to provide environmental protection”).

236. *See supra* Part III.A.1.

237. *See, e.g., David Farrier, Conserving Biodiversity on Private Land: Incentives for Management or Compensation for Lost Expectations?*, 19 HARV. ENVTL. L. REV. 303, 391 (1995) (advocating combining carrots and sticks in an ecosystem-focused paradigm of regulation).