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# Evaluating Incentive Mechanisms for Conserving Habitat

## ABSTRACT

*Private lands have an important role in the success of the Endangered Species Act (ESA). The current command-and-control approach to protecting species on private land has resulted in disincentives to the landowner, which have decreased the ability of the ESA to protect many of our endangered and threatened species. Herein we define and evaluate, from an economic perspective, eight incentive mechanisms, including the status quo, for protecting species on private land. We highlight the strengths and weaknesses and compare and contrast the incentive mechanisms according to a distinct set of biological, landowner, and government criteria. Our discussion indicates that market instruments, such as tradable permits or taxes, which have been successful in controlling air pollution, are not as effective for habitat protection. Alternatively, voluntary incentive mechanisms can be designed such that landowners view habitat as an asset and are willing participants in protecting habitat. The incentive mechanism best suited for conserving habitat in a given region depends on many factors, including government funding, land values, quantity and quality of habitat, and the region's developmental pressure.*

## I. INTRODUCTION

The Endangered Species Act of 1973 (ESA) exemplifies the struggle between private lands and the public good that arises when the common good is held in private hands.<sup>1</sup> The ESA protects species on public and private lands because they have "ecological, educational, historical, recreational and scientific value" unaccounted for in the

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1. Endangered Species Act of 1973, 16 U.S.C. §§ 1531-1544 (2000).

course of "economic growth and development."<sup>2</sup> While 30 years ago this language seemed harmless enough, today the ESA is the front line in the conflict between advocates of private property rights and activists promoting the common good.<sup>3</sup> Three factors deepen the debate over species protection on private lands. First, most land in the United States is privately owned.<sup>4</sup> Second, about half of endangered species rely on this private land for 80 percent of their habitat.<sup>5</sup> Third, some landowners fear that strict regulatory enforcement of the ESA may deny property owners valuable use of their land, which rises to the level of a Fifth Amendment "taking"—private property taken for a public use without just compensation.<sup>6</sup> But the cooperation of private landowners remains critical for the preservation of endangered species. Habitat conservation could be increased by rewarding landowners for good stewardship of habitat. These rewards could be generated at the federal level through amendment of the ESA, or they could be economic incentives at the state or local level.

Recognition of the need to provide incentives for private landowners is not a new concept. Aldo Leopold argued that conservation "ultimately boil[s] down to reward[ing] the private landowner who conserves the public interest."<sup>7</sup> Many observers agree. They believe that endangered species inhabiting private land can be better protected if economic incentives encourage landowners to preserve their property.

Currently, the ESA provides some regulatory incentives for landowners to cooperate with species conservation policy through several programs. Habitat Conservation Plans (HCP) allow a landowner to alter habitat under certain management restrictions.<sup>8</sup> Safe Harbor

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2. *Id.* § 1531.

3. The U.S. Congress passed the Act with little or no opposition: 390–12 in the House and 92–0 in the Senate. See CHARLES C. MANN & MARK L. PLUMMER, *NOAH'S CHOICE: THE FUTURE OF ENDANGERED SPECIES* 156–63 (1995).

4. Michael J. Bean, *The Endangered Species Act and Private Land: Four Lessons Learned from the Past Quarter Century*, 28 ENVTL. L. REP. 10701 (1998).

5. Stephan Polasky et al., *Endangered Species Conservation on Private Land*, 15 CONTEMP. ECON. POL'Y 66 (1997); see also Gardner M. Brown, Jr. & Jason F. Shogren, *Economics of the Endangered Species Act*, 12 J. ECON. PERSP. 3 (1998); Jeffrey A. Michael, *Efficient Habitat Protection with Diverse Landowners and Fragmented Landscapes*, 6 ENVTL. SCI. & POL'Y 243 (2003).

6. See generally RICHARD A. EPSTEIN, *TAKINGS: PRIVATE PROPERTY AND THE POWER OF EMINENT DOMAIN* (1985).

7. See Bean, *supra* note 4.

8. See Endangered Species Act, 16 U.S.C. §§ 1531–1544 (2000); see also U.S. FISH & WILDLIFE SERV., U.S. DEP'T OF THE INTERIOR, *HABITAT CONSERVATION PLANNING AND INCIDENTAL TAKE PERMIT PROCESSING HANDBOOK* (1996), available at <http://endangered.fws.gov/hcp/hcpbook.html> (last visited Nov. 7, 2003); John F. Turner & Jason C. Rylander, *The Private Lands Challenge: Integrating Biodiversity Conservation and Private Property*, in

Agreements allow the landowner to improve the habitat quality on his land without suffering additional uncompensated land use restrictions.<sup>9</sup> Candidate Conservation Agreements (CCA) are agreements in which a landowner limits future land use restrictions by forging an agreement with the Fish and Wildlife Service to protect a species and its habitat prior to the listing of the species.<sup>10</sup> The HCP and Safe Harbor policies provide benefits to landowners only after ESA sanctions have been levied against their land. CCAs are only applicable to a select group—landowners that assign a value to protection of a species larger than the lost economic value resulting from voluntary land use restrictions.<sup>11</sup>

The incentives for landowners to avoid ESA land use regulations still exist.<sup>12</sup> Landowners may minimize the chances of suffering ESA restrictions by preventing government biologists from looking for listed species on private property, destroying habitat for listed species, or taking listed and potentially listed species.<sup>13</sup> These actions may harm listed species, destroy or reduce the value of habitat, or increase the costs of designating habitat and species recovery. Agencies or private parties can reduce such actions by providing incentives for landowners to cooperate through compensation for takings, rather than through controlling land by utilizing ex ante county permits that dictate “proper” land use or ex post financial penalties for “improper” land use.

A variety of compensation schemes are possible: direct compensation from the government to owners of land taken; tradable rights in habitat, under which those who wish to develop land would buy permits from those who would then not be able to develop; insurance programs through which landowners are compensated if endangered species impose costs on them;<sup>14</sup> or tax breaks to preserve

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PRIVATE PROPERTY AND THE ENDANGERED SPECIES ACT: SAVING HABITATS, PROTECTING HOMES 92, 98 (Jason F. Shogren ed., 1998).

9. See U.S. Fish & Wildlife Serv., SAFE HARBOR AGREEMENTS FOR PRIVATE LANDOWNERS (2002), available at <http://endangered.fws.gov/recovery/harborqa.pdf> (last visited Nov. 7, 2003).

10. See USFWS, CANDIDATE CONSERVATION AGREEMENTS WITH ASSURANCES FOR NON-FEDERAL PROPERTY OWNERS (2002), available at <http://endangered.fws.gov/listing/cca.pdf> (last visited Nov. 7, 2003).

11. See Bean, *supra* note 4.

12. See Ian Bowles et al., *Economic Incentives and Legal Tools for Private Sector Conservation*, 8 DUKE ENVTL. L. & POL'Y F. 209 (1998).

13. See Endangered Species Act, 16 U.S.C. § 1532(19) (2000). (defining “take” as to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct”).

14. A good example is the fund created by the not-for-profit organization Defenders of Wildlife to compensate ranchers for the value of livestock lost due to endangered wolves. In part, the compensation program has been used to offset opposition to the reintroduction of endangered wolves. See DEFENDERS OF WILDLIFE, THE BAILEY WILDLIFE FOUNDATION

large areas of land, rather than to break them up to pay federal estate taxes. Defenders of Wildlife, for instance, reviewed each state to see what incentive-based approaches are currently being used to encourage habitat conservation on private land.<sup>15</sup> Based on a survey of state incentive programs, they found that about 400 incentive programs enrolling some 70 million private acres exist in the 50 states—50 percent of which were created within the last decade. The typical state offers about four to six conservation incentives, usually in some form of direct payment and easement with tax relief. About 28 percent of the states make direct payments, 22 percent provide education and technical support, 20 percent give tax relief, and 13 percent use property right tolls like easements and deed restrictions. Market institutions like tradable permits for species protection were used in about three percent of the programs.<sup>16</sup> The open question remains: In which situations is each economic incentive mechanism preferred or is a combination of mechanisms the best alternative?

This article brings an economic perspective to the review of eight incentive mechanisms—zoning, impact fees, subsidies, tradable development rights, conservation banking, fee simple acquisition, and conservation easements in the form of either purchased development rights or donations for tax relief. Examples exist of nearly all these incentive options and none are simple or straightforward to implement. In our review of these eight incentive mechanisms we describe the pros and cons for each mechanism and provide examples. The following section compares and contrasts each incentive mechanism according to a broad set of criteria that addresses perceived biological needs, landowner interests, and regulatory concerns. The criteria respect Leopold's evolutionary ecological land ethic that reflects the scientific notion that nature is not a collection of separate parts but an integrated system of actions, reactions, and feedbacks.<sup>17</sup> This notion focuses on defining the natural system within the context of human interaction and well-being. The understanding of the natural system is promoted by working together to define a set of evaluative criteria that reflect a range of ethical views. We grade each incentive mechanism on a five point scale, ranging from *very high* to *very low*, for eleven criteria: ability to target land specific aspects, permanence, active habitat management, voluntary

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WOLF COMPENSATION TRUST, available at <http://www.defenders.org/wolfcomp.html> (last visited Oct. 29, 2003).

15. SUSAN GEORGE, DEFENDERS OF WILDLIFE, CONSERVATION IN AMERICA: STATE GOVERNMENT INCENTIVES FOR HABITAT CONSERVATION (2002), available at <http://www.biodiversitypartners.org/Incentives/Report/Intro.html> (last visited Nov. 7, 2003).

16. *Id.*

17. See generally ALDO LEOPOLD, A SAND COUNTY ALMANAC, AND SKETCHES HERE AND THERE (1949).

participation, privacy maintained, stewardship recognized, administrative costs, monitoring and enforcement costs, acquisition costs, "deadweight losses" associated with private information,<sup>18</sup> and risk of habitat destruction.

## II. INCENTIVE MECHANISMS

We now explain and describe the eight incentive mechanisms listed above from an economic perspective. When possible, we provide examples and make comparisons. Each incentive mechanism is considered in turn.

### A. Zoning

As a comparative benchmark to better understand the usefulness of flexible economic incentive mechanisms, we first discuss zoning, a standard approach to control land use for questions on endangered species.<sup>19</sup> Local governments, by exercising their police power of command and control, influence activities on private property through zoning ordinances. These ordinances either specify allowable land uses or enjoin particular activities for specific land regions.<sup>20</sup> Governments have traditionally used zoning to restrict development and other land uses to protect attributes and characteristics of the environment that the government, acting in the public's interest, deems desirable.<sup>21</sup> Governments use zoning to guide development toward existing infrastructure and away from environmentally sensitive areas. In Utah, zoning has also been employed to protect scenic views, open space, vegetation and tree preservation, and river corridors.<sup>22</sup>

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18. "Deadweight loss" is the economic term for lost value to society due to the inefficient allocation of resources.

19. When an endangered species is found on private land, the landowner is restricted from undertaking activities that may harm the species. The land use restrictions sever the landowner's rights to all land uses that may harm the listed species. Thus, the ESA restrictions serve to zone the land for species protection. See Andrew J. Miller, *Transferable Development Rights in the Constitutional Landscape: Has Penn Central Failed to Weather the Storm?*, 39 NAT. RESOURCES J. 459, 462-63 (1999).

20. U.S. Fish & Wildlife Serv., *Land Acquisition Planning*, pt. 341, in U.S. FISH AND WILDLIFE SERVICE MANUAL (1996), available at <http://policy.fws.gov/ser300.html> (last visited Nov. 7, 2003).

21. Miller, *supra* note 19.

22. UTAH CRITICAL LAND CONSERVATION COMMITTEE, LAND CONSERVATION IN UTAH: TOOLS, TECHNIQUES, AND INITIATIVES (1997), available at <http://www.governor.state.ut.us/> (last visited Nov. 7, 2003) [hereinafter UCLCC].

## B. Impact Fees

Impact fees have become a popular conservation tool over the last two decades. An *impact fee* is an ex ante cash payment or in-kind payment by a developer to a government as a precondition to receive a development permit. An example of an in-kind payment is when a developer constructs a new community park. These expenditures are called *exactions* and take the form of a cash payment, land donation, public park, street, or other public good.<sup>23</sup> Regardless of whether the land use exaction is a cash payment or an in-kind transfer, the developer assigns a cost to receiving the development permit. This cost is the impact fee.

Impact fees help assure that developers who create the new demand for public goods also pay for that demand.<sup>24</sup> Impact fees are usually paid before the developer obtains his permit, which allows the new public goods to be created before completion of the development project. The fee offsets the negative consequences of development to the surrounding environment and existing infrastructure. For instance, developers pay an impact fee as a condition for receiving permits for new projects that would otherwise increase the demand for existing public goods and services. The revenues received from impact fees finance the provision of new public goods such as parks, recreational facilities, open space acquisition, and infrastructure improvements.<sup>25</sup>

A local government's right to assess an impact fee on new development rests in its regulatory authority, which is authorized by the state. This use of police power by local governments has encountered its share of conflict. Related litigation has resulted in court rulings requiring a "rational nexus" to exist between the impact fee and the development's negative impact on the community.<sup>26</sup> To be legal, the impact fee must exhibit a direct relationship between the externalities caused by the developer's activities and the purpose for which the fees are used.<sup>27</sup> Establishing such a cause and effect is a matter of accurately forecasting future demand for a public good, which is always a challenge due to the imprecision of economic information. In general, impact fees are paid

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23. See ALAN A. ALTSCHULER ET AL., REGULATION FOR REVENUE: THE POLITICAL ECONOMY OF LAND USE EXACTIONS 3-6 (1993).

24. Jan K. Brueckner, *Infrastructure Financing and Urban Development: The Economics of Impact Fees*, 66 J. PUB. ECON. 383, 385 (1997).

25. See ALTSCHULER ET AL., *supra* note 23.

26. *Id.* at 51-54. The "rational nexus" is codified by state statutes. See, e.g., Home Builders Ass'n of Dayton v. City of Beavercreek, 729 N.E.2d 349 (Ohio Sup. Ct. 2000); see also Nollan v. Cal. Coastal Com. 483 U.S. 825 (1987).

27. For further discussion, see ALTSCHULER, *supra* note 23, at 51-54, and Miller, *supra* note 19, at 472-86.

when the developer purchases his permit, are generally not refundable, and are used for offsite projects that benefit society as a whole. The municipality determines how, where, and for what the impact fees are to be spent, but these projects must be reasonably related to the development and be justified by a communities' general plan.<sup>28</sup>

An alternative to impact fees for development projects is a *performance bond*. Performance bonds are required deposits that developers pay, prior to initiating a project, to insure that predetermined onsite quality levels are met.<sup>29</sup> Performance bonds are not impact fees, rather they are insurance that in-kind impact fees are satisfied—the developer builds the community center, public park, etc. Bonds can fund the acquisition and construction of public goods, satisfying the increase in demand that results from new development. The bonds, upon maturity, are typically paid for through the community's general tax fund, which places the burden of funding on all local residents. The developer must pay the costs as they arise and oversee the project to ensure the quality standards are met. Once the regulator determines that the developer has met the contract conditions, the performance bond is refunded.<sup>30</sup>

### C. Subsidies

Federal, state, and local regulators as well as non-governmental organizations (NGOs) offer subsidies as financial assistance to landowners.<sup>31</sup> Subsidies can be used to create an incentive that

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28. See ALTSCHULER ET AL., *supra* note 23, at 51-54.

29. For a discussion on environmental bonds, see NICK HANLEY ET AL., ENVIRONMENTAL ECONOMICS: IN THEORY AND PRACTICE 85-86 (1997).

30. *Id.* at 85-87.

31. Examples abound. Landowners are paid a subsidy to conserve the habitat of the imperiled bog turtle by the North Carolina Herpetological Society. In Texas, Environmental Defense subsidizes landowners to undertake management strategies that protect endangered songbirds. ENVIRONMENTAL DEFENSE, THE TEXAS HILL COUNTRY ENDANGERED SONGBIRD SAFE HARBOR AGREEMENT (2003), available at <http://www.environmentaldefense.org/article.cfm?Contentid=142> (last visited Nov. 7, 2003). State subsidy programs are plentiful. See, e.g., EMILY NOAH & YINLAN ZHANG, ENVIRONMENTAL DEFENSE, COMPENDIUM OF STATE LANDOWNER INCENTIVE PROGRAMS FOR THE CONSERVATION OF BIOLOGICAL DIVERSITY (2001), available at [http://www.environmentaldefense.org/documents/2341\\_StateIncCompendium%2Epdf](http://www.environmentaldefense.org/documents/2341_StateIncCompendium%2Epdf) (last visited Nov. 7, 2003). Three examples are presented also in the text: IDAHO DEP'T OF GAME AND FISH, HABITAT IMPROVEMENT PROGRAM, available at <http://www2.state.id.us/fishgame/hunt/programsinfo/hip/hip.htm> (last visited Nov. 7, 2003) [hereinafter HIP]; CA. DEP'T OF FISH AND GAME, TIMBER TAX CREDIT, available at [www.dfg.ca.gov/timbertax/ttcp\\_2.html](http://www.dfg.ca.gov/timbertax/ttcp_2.html) (last visited Nov. 7, 2003); WASHINGTON STATE SALMON RECOVERY FUNDING BOARD, available at <http://www.iac.wa.gov/sr/b/default.asp> (last visited Nov. 7, 2003). These programs are frequently implemented in conjunction with federal and local municipal governments.



encourages landowners to maintain their land in an undeveloped state or to mitigate the environmental impact of development by helping the landowner meet maintenance and restoration costs of environmentally sensitive areas.<sup>32</sup> Subsidies take the form of grants, loans, cash payments, or tax allowances that are offered by the appropriate regulating entity.<sup>33</sup> Subsidy programs are funded by numerous methods, including tax revenue, lottery funds, and special permits. We now consider four examples of existing programs to illustrate how subsidies are used in species protection.

### 1. Subsidy Example #1. Tax Benefits: California's Timber Tax Credit

The California Department of Fish and Game (CDFG) administers a subsidy program, called the Timber Tax Credit Program (TTCP).<sup>34</sup> The TTCP induces private landowners to undertake conservation projects that will improve habitat and the probability of survival of the coho salmon, Chinook salmon and the steelhead trout.<sup>35</sup> The TTCP provides a tax credit of up to \$50,000 per year to the private landowner, upon completion of the approved project.<sup>36</sup> Approved projects include the restoration of the stream banks or improvements to the flow of the stream, revegetating the habitat with indigenous plants, performing upland work to reduce sediment runoff, and improving the timing and distribution of water returning to the stream.<sup>37</sup> Many projects decrease the speed of the streamflow and cool the temperature of the water.<sup>38</sup>

A landowner who is interested in participating in the TTCP submits an application listing the applicant's personal information, a brief description of the proposed project, an estimate of total and qualified project costs, directions to the proposed project, estimated time frame, type of fish that will likely benefit from the project, and the tax

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32. HANLEY ET AL., *supra* note 29, at 72. Although subsidies are discussed in terms of air pollution reduction, one can easily transfer the idea to land uses and find numerous examples to support the definition.

33. *Id.*

34. THE RESOURCES AGENCY, CA. DEP'T OF FISH AND GAME, INLAND FISHERIES DIVISION, TIMBER TAX: FISH (RELATED) INCENTIVES FOR SUSTAINABLE HABITAT (2000), available at [www.dfg.ca.gov/timbertext/ttcp\\_2.htm](http://www.dfg.ca.gov/timbertext/ttcp_2.htm) (last visited Nov. 7, 2003) [hereinafter CRA].

35. *Id.*

36. *Id.*

37. *Id.*

38. *Id.* Salmon eggs are sensitive to both water velocity and water temperature. High water velocities wash out the gravel beds where salmon spawn. Also, salmon eggs are damaged as the temperature of the water increases. CITY OF SEATTLE, THE THREATS SALMON FACE AT EACH STAGE OF THE LIFE CYCLE, at <http://www.cityofseattle.net/salmon/threats.htm> (last visited Oct. 29, 2003).

credit recipient's name and identification number.<sup>39</sup> Upon receipt of the application and attachments, the CDFG determines if the proposed project complies with state and federal law. Projects in compliance are given an initial onsite inspection, and then can be approved for tax credit. Tax credits are not allocated until the landowner satisfies the terms of the proposed project.<sup>40</sup> A final inspection of the project is conducted within 30 days of completion, and if the project satisfies the inspection, a tax credit certificate is issued within 90 days.<sup>41</sup>

Tax credits can be up to ten percent of the estimated qualified costs of the proposed project, which are the costs for labor, materials, and, in some instances, the rental rate for heavy equipment.<sup>42</sup> The costs must be incurred for purposes that directly increase the survival rate of salmon and steelhead. Costs associated with the installation of water pumps, well drilling, permanent roads and buildings, and services rendered by professional engineers do not qualify.<sup>43</sup> At the end of the year, the CDFG sums the estimated qualified costs for all of the completed approved projects and then divides \$500,000 by that sum to obtain the tax credit percentage, which cannot exceed ten percent.<sup>44</sup> The estimated qualified costs are then multiplied by the tax credit percentage and the landowner is issued a tax credit in that amount. This tax credit is levied against the net tax and, if not completely used in the year issued, the remaining credit can be applied to tax liabilities in future years. The timber tax credit is funded by a tax placed on timber sales outside of the United States and receives approximately \$500,000 a year, which is issued entirely in credits. The costs of administering the program are covered by a non-dedicated preservation fund.<sup>45</sup>

## 2. Subsidy Example #2. Cost Share: Idaho's Habitat Improvement Program

The Idaho Department of Fish and Game (IDFG) administers the Habitat Improvement Program (HIP), which is a cost share program that allocates funds for improvements on both private and public lands in Idaho.<sup>46</sup> The IDFG recognizes the role private landowners play in providing habitat for wild birds. The primary objective of HIP is to encourage private landowners to invest in habitat restoration and

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39. See CRA, *supra* note 34.

40. *Id.*

41. *Id.*

42. *Id.*

43. *Id.*

44. *Id.*

45. *Id.*

46. See HIP, *supra* note 31.

enhancement projects that increase the populations of wild bird species.<sup>47</sup> The IDFG introduced the HIP because changes in the agricultural production practices negatively affected bird populations. Such changes include new forms of irrigation and increased use of marginal land.<sup>48</sup>

The IDFG attributes the increased attrition of wild birds, in part, to the farmers' decreased dependence on water canal systems due to new irrigating technologies, such as sprinkling systems, which make canals obsolete.<sup>49</sup> As a result, irrigation ditches were lined with concrete or removed completely, thereby eliminating habitat areas that provided wild game birds winter homes and nesting areas necessary for reproduction. The threat to the population of wild birds is also impacted by farmers who have increased their usage of the land, becoming more efficient by employing land that was previously idle and often occupied by wild birds.<sup>50</sup>

Landowners interested in participating in the HIP can contact the local office of the IDFG. Upon notification, the IDFG provides a habitat biologist who evaluates the land and designs the habitat restoration project so it benefits upland game and wild birds.<sup>51</sup> Not all landowner requests are funded. For those projects that are funded, IDFG personnel assist the landowner in identifying indigenous vegetation and provide other technical information concerning species needs and growing conditions.<sup>52</sup> Accepted projects can encompass revegetating or creating riparian areas, erecting fences to keep livestock away from wild game habitat, creating water sources, establishing windbreaks, or providing wild animals with winter forage.<sup>53</sup> Projects that provide a benefit to the local wildlife can be implemented on land parcels of all shapes and sizes and may be in conjunction with other government programs.<sup>54</sup>

Landowners with accepted projects enter into an agreement with the IDFG that documents the project plan and specifies the landowner's requirement to maintain the land, which typically extends for a period greater than ten years. The IDFG reimburses up to 75 percent of the landowner's costs when not in conjunction with the Conservation Reserve Program (CRP) and 37.5 percent for projects on lands enrolled in the CRP, with a maximum of \$2000 per project.<sup>55</sup> The IDFG encourages,

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47. *Id.*

48. *Id.*

49. *Id.*

50. *Id.*

51. *Id.*

52. *Id.*

53. *Id.*

54. *Id.*

55. *See infra* note 78.

but does not require, project participants to allow public access to their land, and landowners can leave the HIP at any time by returning the cost share funding.<sup>56</sup>

### 3. Subsidy Example #3. Cost Share: Washington's Salmon Recovery Funding Board

The Salmon Recovery Funding Board (SRFB) administers a program in Washington, the purpose of which is to "support salmon recovery by funding habitat protection and restoration projects and related programs and activities that produce sustainable and measurable benefits for fish and their habitat."<sup>57</sup> The SRFB consists of ten members. Five members are appointed by the Governor of the State of Washington, one of which is a representative of the governor's cabinet. State agency directors from the Department of Ecology, the Department of Game and Fish, the Department of Natural Resources, the Department of Transportation, and the State Conservation Commission make up the remaining five board members. Only the five appointed board members are given the right to vote on the procedures and policies associated with obtaining SRFB funding.<sup>58</sup>

SRFB funds are made available to private landowners, state agencies, cities, counties, conservation districts, special purpose districts, American Indian tribes, and not-for-profit organizations.<sup>59</sup> The funds are obtained through a two-step process. In step one, the landowner or other interested party submits a proposed project to the local lead entity. The local entity can be a not-for-profit organization, a local government, or a tribal government. But the entity must be agreed upon by the cities, counties, and tribes located within the region the lead entity is to serve.

The requirements the lead entities place upon the applicant vary from region to region but must include several SRFB mandated criteria. The minimum costs of a project are \$5000, and the SRFB requires that the applicant provide matching funds of 15 percent of the requisitioned funds.<sup>60</sup> These requirements are thought to increase the probability of the project being completed. Next, the project proposal should specify the

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56. See *supra* note 46.

57. SALMON RECOVERY FUNDING BOARD, REPORT 18, POLICIES AND PROJECT SELECTION GRANTS MANUAL, SECOND ROUND, 2000 CYCLE, available at [http://www.iac.wa.gov/Documents/Manuals&Forms/Manual\\_18.pdf](http://www.iac.wa.gov/Documents/Manuals&Forms/Manual_18.pdf) (last visited Nov. 7, 2003) [hereinafter SRFB 18].

58. *Id.*; see also OFFICE OF THE INTERAGENCY COMMITTEE, ABOUT THE BOARD, at <http://www.iac.wa.gov/srfb/board.htm> (last visited Nov. 7, 2003).

59. SRFB 18, *supra* note 57, at 6-7.

60. *Id.* at 7.

exact location of the project, unless the applicant can prove that the project could be located anywhere within a specified region.<sup>61</sup>

Finally, to be eligible for funding, the project must be one of eight types: (1) acquisition of land in its entirety or acquisition of a purchased development rights (PDR) easement;<sup>62</sup> (2) improvements to fish migration up and downstream; (3) screening fish from in-stream diversions such as dams or headgates or creating a fish by-pass; (4) improvements to the habitat below the high water mark, including increasing or decreasing the amount of gravel, rocks, wood, and plants in the stream bed, along the stream banks, or in the flood plain; (5) increasing the quality of the riparian area by planting indigenous vegetation, removing evasive plants, fencing the area from livestock, repairing stream crossings, or improving the quality of the water supply; (6) improvements to the area outside of the riparian area, or upland, that decrease the sediment runoff, provide shade for cooling the water, and affect the time it takes for water to reach the stream; (7) projects that are a combination of any of the above, in particular those projects that provide for both the acquisition and restoration of salmon habitat; and (8) evaluations, studies, and reports that are justifiably needed to improve the administration of the program.<sup>63</sup>

After reviewing proposals, step two requires that the lead entities across the state submit a prioritized list of projects to the SRFB.<sup>64</sup> This list is then scrutinized according to the SRFB funding policies and a scientific evaluation and assessment of each project is done. Each project must be accompanied by a standard application, which includes general information such as the project type, a description of the project, requested funding, how the requirement for the matching contribution is to be met, project cost estimates, and a biological assessment that addresses species information, habitat factors, necessary permits, and measurement information.<sup>65</sup>

To aid the SRFB in evaluating projects, each project description on the list must also respond to three threshold questions and six evaluation questions. The threshold questions address how the project is to be monitored for effectiveness, the long-term plan for managing and maintaining the project, and whether the proposed project is already legally required to be undertaken.<sup>66</sup> The evaluation questions provide the

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61. *Id.* at 9.

62. See discussion on easements, *infra* section II.G.

63. SRFB 18, *supra* note 57, at 8-12.

64. *Id.* at 6.

65. SALMON RECOVERY FUNDING BOARD, FUNDED PROJECTS: POLICIES AND PROJECT AGREEMENTS, available at [http://www.iac.wa.gov/Documents/Manuals&Forms/Manual\\_7.pdf](http://www.iac.wa.gov/Documents/Manuals&Forms/Manual_7.pdf) (last visited Nov. 7, 2003) [hereinafter FUNDED PROJECTS].

66. *Id.* at 3-4.

board with information concerning the expected benefit of the project to the survival of salmon, how well the project complements other projects or programs for salmon recovery, the scientific basis or conservation plan that supports the project, the cost effectiveness of the project, the ability of the project coordinator to complete the proposed project, and the reason that the project should be undertaken.<sup>67</sup>

Upon receipt of the applications by the SRFB, a technical panel of people with experience and expertise in various scientific fields and employees of the U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) evaluates the projects.<sup>68</sup> The evaluation specifies whether the project has a high benefit to salmon, the level of certainty the project exhibits, and the importance of the project on a regional scale. Based upon the evaluation, recommendations are presented to the SRFB in the form of a report, which is used in the decisionmaking process.<sup>69</sup> Once decisions are made, the recipients of funding deal directly with the SRFB and the Washington State Office of the Interagency Committee for Outdoor Recreation. These are the two entities responsible for monitoring and enforcing agreements.<sup>70</sup> The Salmon Recovery Funding Board is an excellent example of a state administered cost share subsidy program for protecting an endangered species.

#### *4. Subsidy Example #4. Conservation Leasing: The USDA's Conservation Reserve Program*

The Conservation Reserve Program (CRP) has its roots in the dust bowl of the 1930s and the Soil Bank Act of 1956.<sup>71</sup> The CRP was established in 1985 when Congress recognized that eroding cropland needed protection. Congress passed the Food Security Act of 1985,<sup>72</sup> with the goal to reduce soil erosion by paying farmers to idle highly erodible lands.<sup>73</sup> The CRP was reauthorized under the Food, Agriculture, Conservation, and Trade Act of 1990, and the goals of the CRP were extended to

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67. *Id.*

68. *See* SRFB 18, *supra* note 57, at 19-20.

69. *Id.* at 19-27. The Salmon Funding Recovery Board makes the final decision concerning which projects are funded. Once projects are chosen, the applicant and the office of the Interagency Committee for Outdoor Recreation enter into a formal project agreement.

70. *Id.* at 25. Monitoring the project and providing stewardship are the responsibility of the applicant, the terms of which are included in the formal project agreement.

71. U.S. DEP'T OF AGRIC., THE CONSERVATION RESERVE PROGRAM, FARM SERVICE AGENCY ONLINE, at <http://www.fsa.usda.gov/dafp/cepd/12logocv.htm> (last visited Nov. 7, 2003).

72. Food Security Act of 1985, Pub. L. No. 99-198, 99 Stat 1354 (enacted Dec. 23, 1985).

73. *Id.* § 1234(c)(1).

include environmental concerns and improvements in the quality of water along with the previous goal of reducing soil erosion.<sup>74</sup>

The CRP is administrated by the Commodity Credit Corporation through the Farm Service Agency, which is part of the U.S. Department of Agriculture (USDA). Farmers are paid a subsidy to place land previously in commodity production into approved conservation practices.<sup>75</sup> Landowners receive a per acre subsidy based on the rental rate of the land and cost share assistance for planting long-term approved land cover.<sup>76</sup> The CRP targets lands that provide benefits for enhanced water quality, decreased soil erosion, and wildlife protection.<sup>77</sup>

In 1994, the priority placed on environmental considerations increased, and the CRP was redirected to enlist land that provided for greater environmental benefits.<sup>78</sup> To accomplish the task of increasing the enrollment of environmentally sensitive lands, the USDA announced that owners of less sensitive lands—lands not “devoted to high-priority conservation practices” or lands over 100 feet away from rivers, streams, and other bodies of water—were allowed an early release from CRP contracts.<sup>79</sup> Lands that opted out of CRP contracts through the early release provision were replaced with lands along riverbanks or other riparian areas, or lands that served as filter strips. In an effort to encourage landowners possessing the more desirable land to enroll, the USDA paid extra for environmentally sensitive lands.<sup>80</sup>

The passage of the Federal Agricultural Improvement and Reform Act of 1996 (FAIR) confirmed the environmental focus of 1994.<sup>81</sup>

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74. Food, Agriculture, Conservation, and Trade Act of 1990, Pub. L. No. 101-624, 104 Stat. 3359 (enacted Nov. 28, 1990). See also ENVIRONMENTAL DEFENSE, PROGRESS ON THE BACK FORTY: AN ANALYSIS OF THREE INCENTIVE-BASED APPROACHES TO ENDANGERED SPECIES CONSERVATION ON PRIVATE LAND (2000), available at [www.environmentaldefense.org/documents/150\\_backforty%2EPDF](http://www.environmentaldefense.org/documents/150_backforty%2EPDF), (last visited Nov. 7, 2003); Bruce A. Babcock et al., *The Economics of a Public Fund for Environmental Amenities: A Study of CRP Contracts*, 78 AM. J. AGRIC. ECON. 961, 961-71 (1996).

75. U.S. DEPT. OF AGRICULTURE, FARM SERVICE AGENCY, CONSERVATION RESERVE PROGRAM, available at <http://www.fsa.usda.gov/dafp/cepd/crp.htm> (last visited Nov. 7, 2003).

76. U.S. DEPT. OF AGRICULTURE, FARM SERVICE AGENCY, FACT SHEET: ELECTRONIC EDITION, available at <http://www.fsa.usda.gov/pas/publications/facts/html/crp03.htm> (last visited Nov. 7, 2003) [hereinafter FSAa].

77. *Id.*

78. U.S. DEPT. OF AGRICULTURE, FARM SERVICE AGENCY, HISTORY OF THE CRP: A NEW DIRECTION, available at [www.fsa.usda.gov/dafp/cepd/12crplogo/history.htm](http://www.fsa.usda.gov/dafp/cepd/12crplogo/history.htm) (last visited Nov. 7, 2003).

79. *Id.* For example, 684,000 acres were released from CRP contracts through the early release provision.

80. *Id.* Landowners were paid a bonus incentive payment of ten percent of the rental rate.

81. Federal Agricultural Improvement and Reform Act of 1996, Pub. L. No. 104-127, 101 Stat. 888 (1996).

The Farm Security and Rural Investment Act of 2002 continues to focus on protecting environmentally sensitive land and authorizes 39.2 million acres to be maintained in the CRP.<sup>82</sup> As of 1996, nearly 33 million acres had been taken out of production as a result of CRP enrollment, with an average annual subsidy of roughly \$50 per acre and a total cost of around \$1.8 million per year.<sup>83</sup>

Under the current program, landowners or land tenants interested in enrolling their land in the CRP have two options. The first option is to wait for a periodic CRP sign-up period, in which an interested landowner or tenant submits an eligible bid to the local Farm Service Agency (FSA).<sup>84</sup> A bid will be considered for two types of land. The land is eligible if it has been placed in productive agricultural use for at least two of the last five years and can legally be used for agricultural purposes in future years, is pasture land enrolled in the Water Bank Program, or can support new trees to serve as a windshield or buffer for a riparian area.<sup>85</sup>

Upon approval, the applicant submits a bid representing the necessary subsidy or lease payment required for the applicant to idle his or her land. This bid cannot exceed a set maximum rental rate to be considered.<sup>86</sup> The applicant also includes a description of restoration projects that are undertaken if the land is approved for CRP funding. A cost-share program reimburses 50 percent of the applicant's restoration costs if approved plants are established on the CRP land. The program covers up to 75 percent of the restoration costs if the project is to occur on wetlands.<sup>87</sup>

Many more applicants apply for CRP funds than the program can accept. Decisions on what lands to protect are determined by a formula called the Environmental Benefits Index (EBI), which orders projects through a point system that assigns points according to six environmental characteristics and the project's cost.<sup>88</sup> The higher the

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82. Farm Security and Rural Investment Act, Pub. L. No. 107-171, 116 Stat. 134 (2002). See 2002 Farm Bill—Conservation Reserve Program—Long-Term Policy; Interim Rule, 68 Fed. Reg. 24,830, 24,831 (May 8, 2003) (codified at 7 C.F.R. § 1410).

83. See FSAa, *supra* note 76. Over 34 million acres of farm land will be enrolled in the CRP as of October 1, 2003, U.S. Dept. of Agriculture Farm Service Agency, News Room, *Conservation Reserve Program (CRP) Sign-up 26—Questions & Answers*, available at <http://www.fsa.usda.gov/pas/FullStory.asp?StoryID=1351> (last visited Nov. 7, 2003).

84. *Id.*

85. If the land is cropland, it must be considered to be either highly erodible, to be a wetland, to have significant environmental benefits restored, to be located in a CRP priority region, to surround uncultivated wetlands, or to be likely to experience scour erosion. See FSAa, *supra* note 76.

86. *Id.*

87. *Id.*

88. *Id.*



point total, the better the chance that the applicant's land receives funding under the CRP. The primary factors are the benefits provided to wildlife (in particular existing or restored habitat cover and the significance of the land for ESA-listed species), water quality, and soil protection, each having the potential for 100 points as measured on a sliding scale.<sup>89</sup>

The second option for lands to be entered into the CRP is through the continuous sign-up.<sup>90</sup> This option has the same requirements as the periodic sign-up, with the extra requirement that the land has to have a high priority for conservation. To satisfy the high priority criterion, the land must be suitable as riparian buffers, filter strips, grass waterways, shelterbelts, field windbreaks, living snow fences, contour grass strips, salt tolerant vegetation, or shallow water areas for wildlife.<sup>91</sup> Contracts are signed for ten to fifteen years.<sup>92</sup> The applicant still receives 50 percent cost sharing for restoration and can qualify for additional bonuses of 20 percent and ten percent of the annual rental rate by providing various lands and land attributes and for location in a designated EPA "wellhead protection area."<sup>93</sup>

A criticism of the CRP and other conservation leasing programs is that the funds used to lease the land could be applied to purchasing conservation easements, a mechanism that preserves the land in perpetuity.<sup>94</sup> A response to this critical view is that it is questionable whether one could have secured the same magnitude of land for the

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89. *Id.* Management and maintenance plans are awarded up to 50 points based on the probability the plans are carried out in the long run. The increased air quality that results from windbreaks and the resulting decrease in land erosion from wind factors account for a maximum of 35 points. The location of the land is valued at 25 points at most, with points increasing the more significant or the higher priority the region is for state and national conservation efforts. There is no set maximum point allocation for the cost factor, but more points are earned if no cost share dollars are needed and if the cost per acre is below the Maximum Acceptable Rental Rate (MARR). The MARR is determined separately for each county and is based on the soil productivity relative to other counties and the local rental value of dry land. An applicant's probability of being selected is most influenced by the planting of the cover mixture scored highest by the EBI, with other significant factors being sensitive lands and bidding for a lower subsidy. See FSA ONLINE, FACT SHEET, ELECTRONIC EDITION, CONSERVATION RESERVE PROGRAM SIGN-UP 16, ENVIRONMENTAL BENEFIT INDEX (1997), available at [www.fsa.usda.gov/pas/publications/facts/html/conservation\\_reserve\\_16ebi.htm](http://www.fsa.usda.gov/pas/publications/facts/html/conservation_reserve_16ebi.htm) (last visited Nov. 7, 2003) [hereinafter FSAC].

90. FSA CONSERVATION RESERVE PROGRAM, CONTINUOUS SIGN-UP FOR HIGH PRIORITY CONSERVATION PRACTICES (1997), available at <http://www.fsa.usda.gov/pas/publications/facts/html/contsignup.htm> (last visited Nov. 7, 2003) [hereinafter FSAB].

91. *Id.* at 1

92. *Id.* at 2; see also FSAA, *supra* note 76.

93. FSAB, *supra* note 90, at 2.

94. KEITH WIEBE ET AL., PARTIAL INTERESTS IN LAND: POLICY TOOLS FOR RESOURCE USE AND CONSERVATION (Econ. Res. Serv./U.S.D.A., AER-744, 1996). For a discussion of Easements, see section II.G, *infra*.

same cost. Conservation leasing also provides the time necessary to obtain funding, evaluate projects, and apply the government's limited resources more efficiently. Furthermore, conservation leasing provides incentives to landowners to provide and improve habitat for endangered species. Some also argue that the compensation that landowners receive might change their attitudes toward species—they would now see endangered species as an asset rather than a liability.<sup>95</sup>

Our overview of subsidies for conservation reveals that governments have a flexible tool to match individual incentives and desired conservation targets. Tax benefits, cost sharing, or conservation leases, or some combination can all be used to realign private objectives with broader social goals. Of course, the money for subsidies must come from somewhere, usually tax revenue, and could have otherwise been used for other desirable social objectives (*e.g.*, education, health care). We now consider other incentive schemes that do not require direct government funding to operate.

#### D. Tradable Development Rights with Zoning

Tradable development rights (TDR) programs specify a predetermined maximum level of development within a specified region and then distribute development rights to landowners within the region.<sup>96</sup> Landowners who keep their actual development levels below their allotted development rights level can sell their surplus development rights to other landowners, or they can use them to offset development on other properties.<sup>97</sup> Development rights need to serve their purpose as an incentive to change development control to desired social levels. To meet this goal, total development levels within a given region are limited such that the development rights are seen as a scarce resource that is valuable to developers.<sup>98</sup>

TDR programs ensure that development occurs on the properties with the highest development values, but they do not guarantee that the most environmentally sensitive land is left undeveloped.<sup>99</sup> This unintended result can reduce the net benefits to society when land has a greater habitat value than development value. If this land is still developed under the TDRs, the mechanism has

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95. ENVIRONMENTAL DEFENSE, *supra* note 74.

96. D. Mills, *Transferable Development Rights Markets*, 7 J. URBAN ECON. 63, 63-65 (1980); James Boyd et al., *The Law and Economics of Habitat Conservation: Lessons from an Analysis of Easement Acquisitions 10-11* (Discussion Paper 99-32, Resources for the Future, 1999).

97. Boyd et al., *supra* note 96.

98. HANLEY ET AL., *supra* note 29, at 88-91.

99. Boyd et al., *supra* note 96.

performed poorly. The most common approach to overcome this inefficiency is to combine TDRs with zoning.<sup>100</sup>

Government agencies responsible for land use planning determine which properties, or *zones*, within a specified region should be protected for their valuable environmental characteristics and qualities.<sup>101</sup> They then restrict development of these properties, and landowners are provided with development rights to compensate them for the loss of economic use. These rights then can be sold to developers in the less restricted properties within the region, where development is more desirable.

Restricted properties are called *sending zones*; development properties are called *receiving zones*.<sup>102</sup> Once sending and receiving zones are determined, the regulator decides on a formula for transferring the development rights from one zone to the other. A key feature that ensures developers purchase TDRs from sending zones is that the density of development in receiving zones, prior to acquisition of TDRs, is restricted to less than the demanded density.<sup>103</sup> The price of a TDR is determined through the open market. To facilitate trading and minimize transaction costs, regulators can establish a *TDR bank* or *exchange*, which brings together willing buyers and sellers such that each can find mutual gains through trade.<sup>104</sup>

Tradable development rights can be complex and administratively cumbersome. Establishing this new market involves technical, financial, and legal dimensions that must be addressed prior to the actual trading of development rights. These dimensions include the following: (1) TDR programs should be established with a "clear legal authority"—one way is authorization of TDR programs by state law to minimize costly legal challenges and delays in program implementation; (2) ensuring that the program meets its goals requires the employment of expert land planners, lawyers, economists, and scientist to perform biological assessments, determine the total number and distribution of TDRs, establish a method by which development rights are transferred, record such transfers, set the initial zoned development density and maximum allowable density after TDRs are purchased, and monitor and enforce all transactions; (3) the TDR program has more effective control over land uses if authority rests with one agency, and all other methods for obtaining increases in development density are eliminated—the

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100. See Mills, *supra* note 96, at 66; UCLCC, *supra* note 22; Miller, *supra* note 19, at 465-69.

101. James T.B. Tripp & Daniel J. Dudek, *Institutional Guidelines for Developing Transferable Rights Programs*, 6 YALE J. ON REG. 369, 372-73 (1989); Miller, *supra* note 19, at 465-69.

102. Miller, *supra* note 19, at 465-49; see also Boyd, *supra* note 96.

103. HANLEY ET AL., *supra* note 29, at 88-91; Tripp & Dudek, *supra* note 101, at 373, 377.

104. Tripp & Dudek, *supra* note 101, at 377.

developer has to purchase TDRs to increase his or her development density; (4) the objectives of the land-planning agency should be clear, concise, and rooted in sound scientific knowledge; (5) the demand for development within the region should be significant and impose a significant threat to the region's biodiversity; (6) the regulator should set the supply of TDRs below the demand to insure that TDRs are seen as a valuable asset; (7) TDRs should be distributed to landowners in a method as fair and administratively simple as possible; and (8) the regulatory agency should establish a TDR exchange to reduce the friction within the market, which lowers the barriers of bringing together buyers and sellers and increases the efficiency and effectiveness of the program.<sup>105</sup>

TDRs have been used by various states for close to three decades to protect historical buildings and landmarks, agricultural and ranch lands, open spaces and view corridors, riparian areas, forests, and other ecologically sensitive lands. One of the earliest programs was New York City's Landmark Preservation Law.<sup>106</sup> The program was initiated in the 1970s to protect historical landmarks by restricting development of air above historical buildings.<sup>107</sup> The law allows the owner to be compensated for the lost right to develop by transferring the development rights for that air space to surrounding buildings that are allowed to build beyond the zoned height restrictions. New York City also allows development rights to transfer hands via *zoning lot mergers* between adjacent landowners.<sup>108</sup> These landowners can combine their allowed floor area without joining ownership of the properties, provided the total floor area between the two buildings does not exceed the zoned maximum amount of floor area of the two properties. This system allows a developer to purchase the floor area not in use by an adjacent landowner and exceed the zoning restriction by that amount.<sup>109</sup>

Other TDR programs have been designed to protect large expanses of environmentally sensitive land from the encroachment of development. One example of a TDR program came into existence in New Jersey in the early 1980s. In New Jersey, the Pinelands program

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105. *Id.* at 374-77; David Sohn & Madeline Cohen, *From Smokestacks to Species: Extending the Tradable Permit Approach from Air Pollution to Habitat Conservation*, 15 STAN. ENVTL. L.J. 405, 433-34 (1996).

106. New York City's Landmark Preservation Law, N.Y. Envir. Conser. Law § 8-0105 (McKinney 2003), was established in 1965, available at <http://home.nyc.gov/html/lpc/html/about/> (last visited Nov. 7, 2003); see also Penn Cent. Transp. Co. v. New York, 438 U.S. 104, 114 (1978).

107. Ank Levinson, *Why Oppose TDRs?: Transferable Developmental Rights Can Increase Overall Development*, 27 REGIONAL SCI. & URBAN ECON. 283, 284 (1997).

108. *Id.* at 285.

109. *Id.*

encompasses 1.1 million acres of forested expanse, which is home to several small towns and over 1000 species of plants and animals.<sup>110</sup> The Pinelands have been targeted for preservation by the state, which used a TDR program to limit development. Landowners whose land is restricted from being developed are issued TDRs, the number of which depends upon the preservation value of that owner's land. The landowner can then sell the TDRs to other landowners in the Pinelands region where development is allowed. These landowners must possess TDRs to develop their land beyond the predetermined housing density. New Jersey established a TDR exchange to reduce the transaction costs associated with buyers and sellers locating each other, in which exchange implies bringing the buyer and the seller together. This exchange serves as the catalyst for transactions between willing buyers and sellers and determines the market price of TDRs.<sup>111</sup>

Other TDR programs have been authorized by state statute in 22 states, including six in the west.<sup>112</sup> Kansas and Washington have passed legislation that approves the use of TDRs for the purpose of general zoning.<sup>113</sup> In Idaho, TDRs are used to protect "designated historic properties."<sup>114</sup> Hawaii has approved the use of TDRs for the "protection, enhancement, preservation, and use of historic properties and burial sites."<sup>115</sup> In Arizona, TDRs are used to protect the "public health, safety, and general welfare" of its citizens.<sup>116</sup> Colorado's TDR programs are to be used for the protection of species, species habitat, agricultural and ranching lands, and open spaces.<sup>117</sup>

### E. Conservation Banking

Developers undertaking a new project are frequently required to mitigate the adverse effects of their activities. Mitigation can be onsite or the developer can purchase development credits to satisfy the land use regulation offsite. Development credits can be purchased as needed or

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110. *Id.* at 284; see Miller, *supra* note 19, at 465-69.

111. Richard B. Stewart, *Models for Environmental Regulation: Central Planning Versus Market-Based Approaches*, 19 B.C. ENVTL. AFF. L. REV. 547, 556-57 (1992); Dana Clark & David Downes, *What Price Biodiversity? Economic Incentives and Biodiversity Conservation in the United States*, 11 J. ENVTL. L. & LITIG. 9, 54-55 (1996); Antonio Herman Benjamin & Charles Weiss, Jr., *Economic and Market Incentives as Instruments of Environmental Policy in Brazil and the United States*, 32 TEX. INT'L L.J. 67, 92-94 (1988).

112. Miller, *supra* note 19, at 468.

113. WASH. REV. CODE § 36.70A.090 (2003); KAN. STAT. ANN. § 12-755(a)(2) (2002); Miller, *supra* note 19, at 515-16.

114. IDAHO CODE § 67-4619 (2003); Miller, *supra* note 19, at 514.

115. HAW. REV. STAT. § 6E-15 (2002); Miller, *supra* note 19, at 514.

116. ARIZ. REV. STAT. ANN. § 9-462.01.A.12 (2003); Miller, *supra* note 19, at 514.

117. COLO. REV. STAT. § 30-28-401 (2003); Miller, *supra* note 19, at 514.

the developer can purchase excess credits and bank them to fulfill mitigation requirements of future projects. Developers purchase these credits from private or publicly owned *conservation banks*, which determine the price of credits based on supply and demand.<sup>118</sup> The developer purchases credits only when the cost of mitigation through credit purchase is less than the costs of alternative approaches to mitigation, such as onsite mitigation or establishing a separate conservation bank. If profits are to be made by bank owners, other conservation bank owners will be attracted into the market, and market competition will lower the price of the credits.<sup>119</sup>

The amount of credits that a conservation bank, also called a *mitigation bank*, can sell depends upon the quality and type of habitat and the number of a specific endangered species supported on a specific parcel of land.<sup>120</sup> Bank owners can increase the number of credits at their disposal by engaging in land management activities that increase either the quality of habitat, the ability of the land to protect endangered species, or both. For example, in Georgia the Southlands Mitigation Bank, owned by International Paper Company (IP), is ideal habitat for the Red-cockaded woodpecker.<sup>121</sup> These woodpeckers build nests in pine trees at least 100 years old and require stands at least 30 years old for the purpose of foraging.<sup>122</sup> IP owns 16,000 acres of this habitat in the Southlands Forest region of Georgia.<sup>123</sup> In conjunction with the Environmental Defense organization, IP developed a Habitat Conservation Plan (HCP) covering 5300 of the available 16,000 acres.<sup>124</sup> The HCP established a baseline of two pairs of woodpeckers and included a land management plan to meet a goal of increasing the population to 30 pairs through techniques such as prescribed fire, creating new or restoring existing nesting cavities, and relocating young woodpeckers to the region.<sup>125</sup> As each new pair of woodpeckers is established in the HCP area, IP either obtains a permit to offset an incidental take on its own

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118. See, e.g., CRA, A CATALOG OF CONSERVATION BANKS IN CALIFORNIA (1996), available at [www.ceres.ca.gov/topic/banking/catalogue\\_index.html](http://www.ceres.ca.gov/topic/banking/catalogue_index.html) (last visited Nov. 7, 2003); CRA, PRIVATE LAND PROGRAMS AND INCENTIVES (1999), available at <http://www.dfg.ca.gov/habitats/archive/private.html> (last visited Nov. 7, 2003).

119. *Id.*

120. ENVIRONMENTAL DEFENSE, MITIGATION BANKING AS AN ENDANGERED SPECIES CONSERVATION TOOL 12-16 (1999), available at [http://www.environmentaldefense.org/documents/146\\_mb%2EPDF](http://www.environmentaldefense.org/documents/146_mb%2EPDF) (last visited Nov. 7, 2003) [hereinafter ED1].

121. *Id.* at APPENDIX 1: CASE STUDIES OF SELECTED ENDANGERED SPECIES MITIGATION BANKS 16-18 [hereinafter ED2].

122. *Id.*

123. *Id.*

124. *Id.*; see also U.S. FISH & WILDLIFE SERV., *supra* note 8.

125. ED2, *supra* note 121.

property or sells the credit from the conservation bank to a third party within a specified region and approved by the FWS.<sup>126</sup>

Credits can also be determined according to a particular type and quantity of habitat. The San Vicente Conservation Bank, for example, is a 320-acre parcel in San Diego County, California.<sup>127</sup> The land cover is primarily coastal sage scrub and southern mixed chaparral, habitat for the California gnatcatcher, listed as a threatened species under the ESA.<sup>128</sup> The habitat is good quality and requires little in the way of management and maintenance. The San Vicente Conservation Bank was approved by the California Department of Fish and Game (CDFG) and the FWS and was issued 320 credits.<sup>129</sup> These credits can be sold to landowners within San Diego County for multi-species mitigation needs and other endangered and threatened species.<sup>130</sup>

The Manchester Avenue Conservation Bank (MACB) is a similar reserve also located in San Diego County and serves as a corridor for the El Cajon Open Space.<sup>131</sup> The southern maritime chaparral, a unique habitat, is found on the MACB. Because of the rare quality of this habitat, the MACB was able to negotiate for credits of one acre for 1.8-credits as compared to the standard ratio of one acre for one credit.<sup>132</sup> The MACB is owned by a private enterprise that has used many credits to offset its own development and has sold the remainder to other developers in the region.<sup>133</sup>

Some of the first uses of conservation banks were for wetlands.<sup>134</sup> The banking scheme closely follows the earlier program of wetland mitigation banking, which has been used since the 1980s. Until 1995, wetland banks were primarily owned by state highway departments and were established to provide credits to mitigate for adverse effects to wetlands as regulated by the Clean Water Act (CWA).<sup>135</sup> In 1995, the Environmental Protection Agency (EPA) and Army Corps of Engineers established guidelines to create and manage wetland

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126. *Id.*

127. *Id.* at 2-4.

128. For listing information, see U.S. Fish & Wildlife Serv., at [https://ecos.fws.gov/species\\_profile/SpeciesProfile?spcode=B08X](https://ecos.fws.gov/species_profile/SpeciesProfile?spcode=B08X) (last visited Nov. 7, 2003).

129. ED2, *supra* note 121, at 2-4.

130. *Id.*

131. *Id.* at 4-6. The El Cajon Open Space is a stretch of habitat in the San Diego County area, which is under intense development pressure.

132. ED2, *supra* note 121, at 4-6.

133. *Id.* at 4-6.

134. ED1, *supra* note 120, at 2-3.

135. *Id.* at 1-10. The Clean Water Act of 1977, Pub. L. No. 95-217, 91 Stat. 1566, was amended in 1987 as the Water Quality Act of 1987, Pub. L. No. 100-4, 101 Stat. 7.

mitigation banks.<sup>136</sup> These wetland banks are designed to provide private landowners certainty regarding assessing land, earning and selling credits, and defining the present and future obligations and requirements that a bank owner faces. With these guidelines in place, landowners can predict the costs of their present and future regulatory obligations. This serves to reduce the landowners' risk of investing in a wetlands mitigation bank and results in landowners supplying conservation.<sup>137</sup>

In 1995, California used conservation banking toward preserving habitat critical to reduce the risks to endangered species.<sup>138</sup> By 1998, 43 conservation banks were established in California.<sup>139</sup> Drawing on its experience, California instituted a plan based on 14 principles for successful implementation of a conservation bank:

- In determining mitigation requirements, priority should be placed on protecting the habitat and species in the long run. This is best accomplished off-site and in conjunction with a conservation bank.
- Banks must be established with a legal and enforceable contract or permit.
- A conservation bank can be of any size as long as it is large enough to support an ecosystem approach to conservation. The one exception is when a parcel is one of several parts of a contiguous larger bank reasonably certain to be completed.
- Fee title sale or a conservation easement insuring the land is preserved in perpetuity should be recorded on the title of the land in coordination with the first credit sold.
- Prior to the authorization of a conservation bank, a bank proposal must be approved. For approval, the bank proposal must include the assignment of a bank manager, a description of the banks boundaries and the area for which the credits can be used to offset development, management and maintenance requirements including provisions for how those requirements will be achieved, and the determination of annual reporting responsibilities.
- A plan that details the resources found within the bank, how those resources are to be managed, and how such management is to be funded is required prior to the sale of the first credit.

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136. U.S. ARMY CORPS OF ENGINEERS ET AL., GUIDELINES ON THE ESTABLISHMENT & OPERATION OF WETLAND MITIGATION BANKS IN GEORGIA, available at <http://www.sas.usace.army.mil/bankguid.htm> (last visited Nov. 7, 2003).

137. ED1, *supra* note 120, at 1-10.

138. CRA, A CATALOGUE OF CONSERVATION BANKS IN CALIFORNIA: INNOVATIVE TOOLS FOR NATURAL RESOURCE MANAGEMENT (1996), available at [http://ceres.ca.gov/topic/banking/banking\\_report.html](http://ceres.ca.gov/topic/banking/banking_report.html) (last visited Nov. 7, 2003).

139. *Id.*



- An agency should be designated for the long-term management of the bank.
- A plan should detail the steps to be taken in the event of unsatisfactory performance by the bank owner. These steps should ensure the long-term protection of the bank.
- Monitoring and reporting of management activities centered upon listed species and their habitats should be provided.
- Agencies responsible for ensuring compliance should be granted an easement for the right of entry to monitor the agreement.
- Bank credits should be determined in accordance with the initial, or baseline, condition. Given the baseline, credits can be earned by preserving the land, enhancing the quality or quantity of a habitat or species on the land, restoring the land to its original condition, or creating habitat suitable for species preservation where such habitat did not previously exist.
- The number of bank credits awarded to a bank owner is determined on a case-by-case basis, and negotiations are between the bank owner and the appropriate regulatory agencies.
- A transaction for credits between a bank owner in one region and a developer in another region (out-of-kind mitigation) may be approved on a case-by-case basis.
- Listing of conservation banks with the California Resource Agency is required to maintain an inventory of banks throughout the state.<sup>140</sup>

This California process serves two primary purposes: increasing the certainty about present and future obligations of the bank owner and ensuring that conservation efforts meet the goals of the regulatory agency.<sup>141</sup> The process reduces a regulator's monitoring and enforcement costs by requiring the bank to submit both an annual report and a contingency plan for bank failure, and by specifying the regulatory agency's rights to enter the property.

Unlike impact fees, conservation banking compensates landowners for the provision of a public good and does so by allowing the market to determine the magnitude of the compensation.<sup>142</sup> Conservation banking differs from TDRs because TDRs are an ex-ante approach in which the proportion of land to be developed is determined before

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140. The formal rules for California's conservation bank program can be found at <http://ceres.ca.gov/wetlands/policies/mitbank.html> (last visited Nov. 7, 2003); see also new federal guidelines for the establishment of a conservation bank at <http://endangered.fws.gov/policies/conservation-banking.pdf> (last visited Nov. 7, 2003).

141. ED1, *supra* note 120, at 2-6.

142. See Impact Fees, *supra* section II.B.

development.<sup>143</sup> In contrast, conservation banking is an ex-post mechanism in which landowners establish conservation banks in response to developmental pressures. As development increases, the need to purchase credits increases, and the supply of credits should increase to meet the higher priced demand. The regulator can determine the quantity of land to be conserved by controlling the ratio of credits the developer must purchase to offset the development at the time of development, which gives the regulator flexibility to meet its conservation goals.<sup>144</sup>

### F. Fee Simple Acquisition

Fee simple acquisition is the purchase of land with all of its inherent property rights. Essentially, a market exists for land in which buyers and sellers voluntarily agree to a price and make a deal. Sellers are usually private landowners or organizations; in the context of habitat conservation, buyers are the government, land trusts, and other not-for-profit organizations.<sup>145</sup> They buy land to create public goods such as wildlife preserves, nature trails, and other park lands.<sup>146</sup>

One example of a fee simple acquisition is Snake Creek Canyon, located on the east side of the Wasatch Mountains in Utah. A local ski resort planned to develop the area. Instead, the ski area sold the land to the Nature Conservancy<sup>147</sup> upon choosing to act in the interests of several municipalities, private industry, citizen groups, and a state agency.<sup>148</sup> These entities pooled their resources to reimburse the Nature Conservancy for the initial funds to purchase the land. As a result, Snake Creek Canyon has had its development rights severed.<sup>149</sup> The land trust Utah Open Lands holds the conservation easement. The Utah State Division of Parks has taken on management of the property. This acquisition demonstrates how agencies and organizations can work together to accomplish land use goals.<sup>150</sup>

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143. See TDRs, *supra* section II.D.

144. ED1, *supra* note 120, at 13.

145. LAND TRUST ALLIANCE, SUMMARY OF DATA FROM THE 1998 NATIONAL LAND TRUST CENSUS (2000), available at <http://www.lta.org/aboutlta/census.shtml> (last visited Nov. 7, 2003).

146. Boyd, *supra* note 96, at 6; see also UCLCC, *supra* note 22.

147. The Nature Conservancy is a non-governmental environmental organization with the objective "to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive." See THE NATURE CONSERVANCY, at <http://nature.org/aboutus/> (last visited Nov. 7, 2003).

148. UCLCC, *supra* note 22.

149. *Id.*

150. *Id.*

Another example of cooperation between government agencies and not-for-profit organizations is the conservation efforts between the California Coastal Conservancy (CCC) and NGOs.<sup>151</sup> The CCC offers a wide array of programs to protect the California coastline and the valuable resources found there.<sup>152</sup> Since its inception in 1976, the CCC has helped protect nearly 100,000 acres of wetlands, sand dunes, and farmlands by working with conservation organizations through the Nonprofit Organizations Assistance Program (NOAP).<sup>153</sup> NOAP provides funding to nonprofit organizations for the purpose of acquiring land or interests in land that satisfy CCC objectives. After an organization has acquired the land with NOAP funds, the ownership and costs of managing the land fall on the shoulders of the nonprofit organization.<sup>154</sup>

Land trusts and other nonprofit organizations use fee simple acquisition as a tool to protect land in ecologically sensitive regions, especially focusing on land threatened by urban sprawl. Land trusts originated over 100 years ago in Massachusetts in 1890.<sup>155</sup> Local citizens sought to protect their landscape from development. Over the last century, land trusts have been used to protect lands ranging from wetlands to ranches and from shorelines to farms.<sup>156</sup> Land trusts have increased from 53 in 1950 to over 1200 today and can be found in all 50 states.<sup>157</sup>

Purchasing the land in its entirety through donation gives the land trust more control over land use. The price of this control is the cost

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151. CALIFORNIA COASTAL CONSERVANCY, ABOUT THE COASTAL CONSERVANCY AND COASTAL CONSERVANCY PROGRAMS (2000), at <http://www.coastalconservancy.ca.gov> (last visited Nov. 7, 2003). The California Coastal Conservancy is a state agency that works in conjunction with local municipalities, NGOs, and private individuals to protect environmentally sensitive lands.

152. CALIFORNIA COASTAL CONSERVANCY, PROGRAMS AND PROJECTS, at <http://www.coastalconservancy.ca.gov/Programs/pandp.htm> (last visited Nov. 7, 2003).

153. *Id.* NOAP is a state conservation program that provides nonprofit organizations with working capital and technical assistance to develop approved management techniques for resource management. See CALIFORNIA COASTAL CONSERVANCY, ABOUT THE CONSERVANCY, at <http://www.coastalconservancy.ca.gov/About/about.htm> (last visited Dec. 2, 2003).

154. See *supra* note 152.

155. Michelle Nijhuis, *Acre by Acre: Can Land Trusts Save the West's Disappearing Open Space?*, 32 HIGH COUNTRY NEWS (Feb. 28, 2000), available at [http://www.hcn.org/servlets/hcn.Article?article\\_id=5572](http://www.hcn.org/servlets/hcn.Article?article_id=5572) (last visited Nov. 7, 2003).

156. LAND TRUST ALLIANCE, LAND TRUSTS: THE FRONT GUARDS OF LAND PROTECTION (2000) (on file with author) [hereinafter LTA]; Julie Ann Gustanski, *Protecting the Land: Conservation Easements, Voluntary Actions, and Private Lands*, in PROTECTING THE LAND: CONSERVATION EASEMENTS PAST, PRESENT, AND FUTURE 9, 21 (Julie Ann Gustanski et al. eds., 2000).

157. See LTA, *supra* note 156; Nijhuis, *supra* note 155. See also Michelle Nijhuis, *A Land-Trust Toolbox*, 32 HIGH COUNTRY NEWS, Feb. 28, 2000, available at [http://www.hcn.org/servlets/hcn.Article?article\\_id=5573](http://www.hcn.org/servlets/hcn.Article?article_id=5573).

to manage the land, which requires significant staff and resources.<sup>158</sup> Land trusts try to reduce management costs by serving as a broker or middleman between the landowner and a larger trust or government agency. Land trusts also avoid management costs by acquiring a conservation easement, purchased development rights (PDR), or donated easements, which allows the landowner to remain on the land and maintain the land according to the terms of the easement.<sup>159</sup> In this scenario, the land trust is responsible for monitoring and enforcing the terms of the easement. While enforcement costs have been relatively low to date, land trusts expect them to escalate as easement-encumbered land passes from the initial landowner to subsequent landowners. Trusts set aside funds now to enforce easements in the future. Yet in 2000, more than 90 percent of easement-encumbered land remained with the landowner who signed the contract.<sup>160</sup>

Currently in the western United States, about 250 land trusts exist to protect over a million acres. Land previously held in private ownership is now owned solely by land trusts or in joint ownership between private landowners and land trusts.<sup>161</sup> Every western state has at least one land trust. The number of land trusts in a state is correlated with the pressure to develop in that state. For example, in 1998, California had 119 land trusts protecting 536,922 acres and Texas protected 11,531 acres with 20 land trusts, reflecting varying development pressures in the two states.<sup>162</sup>

An example of a NOAP agreement is the cooperative effort of the CCC and the Mendocino Land Trust (MLT), which purchased two tracts of land bordering the ocean.<sup>163</sup> The first tract, a 74-acre beach property located in Caspar, California, has a stream that serves as spawning ground for the endangered Coho salmon.<sup>164</sup> The second tract is Navarro Point, a 55-acre expanse of coast and open headlands. The combined purchase price for the two properties was \$2.9 million.<sup>165</sup> The long-term management of the Navarro Point property is estimated to cost \$300,000.<sup>166</sup> The Caspar Beach property, which allows for public

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158. Nijhuis, *supra* note 155.

159. Conservation Easements, *infra* section II.G.

160. Nijhuis, *supra* note 155.

161. *Id.*

162. Gustanski, *supra* note 156, at 19.

163. LAND TRUST ALLIANCE, LAND TRUST SUCCESS STORIES—PACIFIC REGION (2000) (on file with author) [hereinafter LTAa].

164. CAL. DEP'T OF FISH AND GAME, CAL. CODE OF REG., tit. 14, § 670.5, STATE AND FEDERALLY LISTED ENDANGERED AND THREATENED ANIMALS OF CALIFORNIA (2000), at <http://www.dfg.ca.gov/whdab/pdfs/TEAnimals.pdf> [hereinafter CDFG].

165. *Id.* See also LTAa, *supra* note 163.

166. LTAa, *supra* note 163.

access, has estimated annual maintenance costs of \$12,000.<sup>167</sup> MLT is currently raising money for the management of Navarro Point and working out an agreement to transfer ownership and maintenance of the Caspar property to the California State Parks Department.<sup>168</sup>

### G. Conservation Easements

Ownership of land provides the landowner certain rights regarding how the land can be used, which include the right to exclude others from using the land, the right to develop the land, the right to produce commodities, and the right to employ other legal rent-seeking activities. A conventional easement is a legal instrument that serves to transfer specific rights in the land from the landowner to another entity.<sup>169</sup> A conservation easement serves the same purpose, except that species and habitat protection is the explicit goal.<sup>170</sup>

A conventional easement is generally negotiated between adjacent landowners where both landowners benefit from the agreement. Ronald Coase implied the concept of an easement in his seminal article *The Problems of Social Cost*.<sup>171</sup> He addressed how bargaining over the resource in question rather than government taxation could remove the social cost caused by a rancher's cattle trampling a neighbor's crops on their way to a watering hole. Coase argued that the rancher and the farmer could both increase their well-being by establishing an easement, assuming the farmer holds the property rights and transaction costs are low.<sup>172</sup> If the farmer would accept a payment from the rancher in exchange for the easement, the rancher's cattle could then cross the farmer's land within the terms of the contract.<sup>173</sup>

Conventional easements are typically affirmative and appurtenant. Affirmative means that the easement holder is given the right to conduct specified activities, such as using the property as a right-of-way.<sup>174</sup> Appurtenant means that the benefits provided by the easement belong to and are typically realized by a neighboring landowner.<sup>175</sup> Such

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167. *Id.*

168. *Id.*

169. WIEBE, *supra* note 94, at 4.

170. *Id.* at 5.

171. Ronald Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 3 (1960), reprinted in *ECONOMICS OF THE ENVIRONMENT: SELECTED READINGS* 109, 109-38 (Robert Dorfman & Nancy Dorfman eds., 1993).

172. *Id.*

173. *Id.*

174. WIEBE, *supra* note 94, at 4.

175. *Id.*

easements have been used to transfer partial interests in land and have been recognized as legitimate for thousands of years.<sup>176</sup>

Like conventional easements, a conservation easement severs some of the interests in the land and transfers those interests to another party. In contrast to a conventional easement, a conservation easement tends to be negative and in gross. Here negative means that rather than allowing the holder of the easement to engage in specified activities, the holder of the easement can restrict the landowner from engaging in specified activities.<sup>177</sup> In gross means the easement holder can be someone other than an adjacent landowner.<sup>178</sup> A conservation easement prohibits the landowner from specified uses on his or her land.<sup>179</sup>

Conservation easements are voluntary contracts between a landowner and the government agency or not-for-profit organization initiating the measure. Conservation easement contracts are negotiated on a property-by-property basis and can be tailored to satisfy individual landowner requirements while maintaining conservation objectives.<sup>180</sup> These contracts typically include a description of the conservation goals for the property, an initial appraisal of the land, acceptable land uses and restrictions on land uses, the landowner's management responsibilities, a statement of the conservator's right to access the land, proof of unencumbered ownership, legal requirements in the event of a contract breach, provisions regarding present and future liabilities, and the landowner's requirement of notification when the property is sold.<sup>181</sup> Contracts also specify duration of the easement and compensation to the landowner.<sup>182</sup>

Consider a rancher whose land borders Yellowstone Park in Montana and offers excellent habitat for the grizzly bear, a species listed as threatened by the FWS.<sup>183</sup> Suppose this rancher is approached by a nonprofit conservation organization and the terms of a conservation easement are negotiated.<sup>184</sup> A contract between the rancher and the not-for-profit organization is created in which the rancher agrees to refrain

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176. *Id.*

177. *Id.*

178. *Id.*

179. *Id.*

180. Boyd, *supra* note 96, at 16.

181. *Id.* at 14.

182. *Id.* at 7.

183. See U.S. FISH & WILDLIFE SERV., BEAR, GRIZZLY, at [https://ecos.fws.gov/species\\_profile/SpeciesProfile?spcode=A001](https://ecos.fws.gov/species_profile/SpeciesProfile?spcode=A001) (last visited Nov. 7, 2003).

184. In Montana, only state and federal agencies or not-for-profit organizations that are qualified by the I.R.S. are allowed to own a conservation easement. See Todd Mayo, *A Holistic Examination of the Law of Conservation Easements*, in PROTECTING THE LAND: CONSERVATION EASEMENTS PAST, PRESENT, AND FUTURE 26, 35 (Julie Ann Gustanski et al. eds., 2000).

from developing any portion of his land and further agrees to limit or discontinue grazing on portions of the land deemed to be valuable grizzly habitat and sensitive to grazing. In return, the rancher receives payment for his conservation efforts. The land conserved increases the likelihood of the species' recovery and eventual delisting. The conservation easement provides societal benefits from the conservation of the land. Possession of the development rights does not give the organization the right to develop the land; in contrast, it gives the holder the right to, and the obligation of, restricting development of the land.<sup>185</sup>

In general, conservation easements are classified into two broad categories—purchased development rights (PDR) easements and donated easements.<sup>186</sup> The type of sellers, the type of buyers, the mode of compensation, and the duration of the contract characterize the difference between the two easements.<sup>187</sup>

### 1. PDR Easements

A PDR easement is a conservation mechanism in which the landowner sells the conservation-incompatible uses of the land for a specified period of time for a cash payment, usually at the fair market value of the easement.<sup>188</sup> The fair market value is the difference between the easement-free value and the easement-encumbered value of the property.<sup>189</sup> Determining just compensation is complicated because no easement market exists because of the classic public goods problem: markets fail to provide an efficient level of a public good because not all the benefits and costs of ownership accrue to the buyer. Buyers therefore have incentive to free ride off the actions of other buyers, such that the market starts to unravel.<sup>190</sup> Additionally, the value of the land unencumbered is uncertain and likely to change in conjunction with changing developmental pressures.<sup>191</sup>

PDR easements are typically entered into by profit-maximizing landowners who require full compensation for their foregone opportunity, equal to the land's development value.<sup>192</sup> The purchaser of a

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185. Boyd, *supra* note 96, at 7; see also WIEBE, *supra* note 94, at 4.

186. Boyd, *supra* note 96, at 6-9.

187. *Id.*; see also Nijhuis, *supra* note 155, at 12; Land Trust Alliance, *American Farm and Ranch Protection Act*, available at <http://www.lta.org/publicpolicy/tax97.htm> (last visited Mar. 9, 2004).

188. Boyd, *supra* note 96, at 6-9.

189. *Id.* at 27; see also WIEBE, *supra* note 94, at 6. Wiebe refers to the difference between the restricted and unrestricted value of the land as the option value, in which the landowner sells the option to develop his or her land to conservation-unfriendly land uses.

190. HANLEY ET AL., *supra* note 29, at 42-44.

191. Boyd, *supra* note 96, at 27-29; see also WIEBE, *supra* note 94, at 36-41.

192. Nijhuis, *supra* note 155, at 12.

PDR easement is often a government agency, which generally has a larger budget than most not-for-profit organizations and is therefore better able to finance the purchase of the easement. The payment for a PDR easement is typically a one-time lump sum payment and PDR easements can be purchased for limited time periods or in perpetuity.<sup>193</sup>

## 2. Donated Easements

The U.S. Internal Revenue Service (IRS) offers tax incentives to landowners who donate in perpetuity the development interests in their land for conservation purposes to a qualified not-for-profit organization or government agency.<sup>194</sup> The IRS requires the donated easement be for land that provides society with a valued public good, and the recipient must be pre-approved by the IRS as tax-exempt and eligible to receive donations used for tax considerations.<sup>195</sup>

A donated easement is based on a tax incentive, which typically appeals to landowners who value the preservation of land and are willing to be compensated at less than fair market value for the easement.<sup>196</sup> Tax incentives can take the form of a deduction in income taxes, a reduction in the base value for estate or gift taxes, and, if the conservation easement meets certain requirements, an additional reduction in the estate tax base.<sup>197</sup>

Qualifying lands must satisfy one of the following conservation purposes: (1) provide education or outdoor recreation to society, (2) provide protection to species by conserving their natural habitat or ecosystem, (3) provide society a scenic vista by preserving open spaces, or (4) provide for the protection of historically significant lands and buildings. Easements are donated to an organization established for conservation purposes and qualified to monitor and enforce the terms of

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193. AMERICAN FARMLAND TRUST, PURCHASE OF AGRICULTURAL EASEMENTS FACT SHEET, available at <http://www.farmlandinfo.org/fic/tas/tafs-pace.html> (last visited Nov. 7, 2003) (providing an example of an agricultural conservation easement program).

194. See INTERNAL REVENUE SERVICE, U.S. DEP'T. OF TREASURY, PUB. NO. 526, CHARITABLE CONTRIBUTIONS 6 (Dec. 2000), available at <http://www.irs.gov/pub/irs-pdf/p526.pdf> (last visited Nov. 7, 2003); PUB. NO. 561: DETERMINING THE VALUE OF DONATED PROPERTY 7 (Feb. 2000), available at <http://www.irs.gov/pub/irs-pdf/p561.pdf> (last visited Nov. 7, 2003). See generally STEPHEN SMALL, PRESERVING FAMILY LANDS: BOOK 1, ESSENTIAL TAX STRATEGIES FOR THE LANDOWNER i-117 (1998). See also WIEBE, *supra* note 94, at 12.

195. INTERNAL REVENUE SERVICE, PUB. NO. 526, *supra* note 194, at 2.

196. Nijhuis, *supra* note 155, at 13.

197. LAND TRUST ALLIANCE, TAX BENEFITS FOR CONSERVATION, at <http://www.lta.org/publicpolicy/taxbenefits.htm> (last visited Nov. 7, 2003) (listing tax benefits for land contributions).



the easement. The easement can then only be resold or transferred to a similar organization or agency.<sup>198</sup>

The deductions provided by a conservation easement to the heirs of an estate are two-fold. First, the value of the estate is reduced by the fair market value of the easement.<sup>199</sup> Second, the land may qualify for an additional 40 percent reduction to the tax base of the estate up to the exclusion limit.<sup>200</sup> To qualify for the additional tax relief, the conservation easement must reduce the value of the land by at least 30 percent. The additional tax relief is less for smaller percentage reductions in estate value.<sup>201</sup> The exclusion limit for deaths occurring in the year 2000 is \$300,000 and increases to \$500,000 for the year 2002 and thereafter.<sup>202</sup> To qualify for the additional tax deduction for high conservation value, the land must satisfy certain ownership requirements and must be within 25 miles of an Office of Management and Budget designated metropolitan statistical area or a federal wilderness area, or lie within ten miles of an urban national forest.<sup>203</sup> Of course, the ongoing debate in Congress over tax policy could change these conditions over the next few years.

These underlying incentives can be the difference between an estate being maintained in one contiguous area or being broken up and sold to meet estate tax liability. Estates that are valued at less than \$675,000 have an estate tax liability of zero. For example, suppose an estate is valued at \$1,500,000 and a landowner or heir donates a conservation easement valued at \$500,000 to a qualified not-for-profit organization. The estate also benefits from a \$400,000 deduction due to the high conservation quality of the land. The estate tax would be levied on an estate valued at \$600,000, and the heirs would escape any estate tax liability as a result of the donation.<sup>204</sup>

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198. INTERNAL REVENUE SERVICE, PUB. NO. 561, *supra* note 194; *see also* Dave Hunt, *Conservation Easements and Donations for Tax Deductions* HABITAT EXTENSION BULL. NO. 14 (Wyoming Game & Fish Dept., Jan. 1994).

199. *See* Taxpayer Relief Act of 1997, Pub. L. No. 105-34, 111 Stat. 788 (1997).

200. *Id.*

201. *Id.*

202. *Id.* The exclusion limit is the size of the estate excluded from estate taxes. The estate tax benefits can be used to reduce the estate's value down to the exclusion limit, so that no estate taxes are incurred.

203. *See* Tax Payer Relief Act of 1997, Pub. L. No. 105-34, 111 Stat 788 (1997), as amended by the Internal Revenue Service Reform Act of 1998, Pub. L. No. 105-206, 112 Stat. 685 (1998); *see also* Stephen Small, *An Obscure Tax Code Provision Takes Private Land Protection into the Twenty-First Century*, in *PROTECTING THE LAND: CONSERVATION EASEMENTS PAST, PRESENT, AND FUTURE 55* (Julie Ann Gustanski et al. eds., 2000).

204. SMALL, *supra* note 194; *see also* LAND TRUST ALLIANCE, AMERICAN FARM AND RANCH PROTECTION ACT (2000), at <http://www.lta.org/publicpolicy/tax97.html> (last visited Nov. 7, 2003) [hereinafter LTAc].

Donated easements may also reduce a landowner's income tax liability. A landowner who donates a conservation easement to a qualified agency can deduct the entire value of the easement from his income tax provided it does not exceed 30 percent of his adjusted gross income.<sup>205</sup> If the easement value exceeds this 30-percent threshold, the landowner can deduct 30 percent of his adjusted gross income for up to six years or until he has exhausted the easement value. The value of the easement is measured as the difference in the property value with and without the easement.<sup>206</sup>

### III. INCENTIVE MECHANISMS: COMPARE AND CONTRAST

A U.S. Senator once said in private conversation that "if we pay landowners to grow endangered species, we will have more than we know what to do with."<sup>207</sup> The question is how to do this in the most cost-effective manner such that biological needs are met, landowner concerns are addressed, and government budgets are solvent. In this section we evaluate each economic incentive described in part II based on three broad criteria: (1) biological needs of the land and species, (2) landowner interests, and (3) government or regulatory concerns.<sup>208</sup> The incentive mechanisms are rated on a five-point scale—very high, high, medium, low, or very low, according to how well the incentive mechanism satisfies each criterion. Table 1 summarizes our discussion of the mechanisms and criteria.<sup>209</sup>

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205. See INTERNAL REVENUE SERVICE, PUB. NO. 526, *supra* note 194, at 8-10.

206. *Id.*

207. This quote comes from personal communication with the authors.

208. We created these three broad criteria to evaluate economic incentives to better understand how each mechanism relates to satisfying the basic elements of collective regulation for the environment: biological needs, political realities, and regulatory limits.

209. After much discussion, we concluded that this type of structure is the best for our purposes in this paper for two main reasons. First, the table is "general," whereas a numerical ranking system will likely depend on the species, the land type, and the landowner. Second, a generic numerical ranking might suggest one mechanism dominates when two or three mechanisms in combination might be best. Future work could involve a specific case study on a species at risk, *e.g.*, protection of the Moapa dace that lives in the warm springs at the headwaters of the Muddy River, which lies northeast of Las Vegas, and work through the table adding a 1-5 numerical ranking to see if any mechanism dominates.

Table 1. Evaluative Criteria & Incentive Mechanisms

	Regulation Zoning	Impact Fee	Subsidy	TDRs	Conservation banking	Fee Simple Purchase	PDR Easement	Donated Easement
<b>CRITERIA</b>								
<b>Biological</b>								
<i>Odds of Coordinated Retired Acres: Larger Habitat Reserves</i>	VH	L	M	VH	VH	M	M	L
<i>Permanency</i>	L-M	VL	VL	L-M-H	VH	L-M	L-M-H	L-M-H
<i>Active Habitat Management</i>	VL	VL	VH	VL	VH	VH	M-H	M-H
<b>Landowner</b>								
<i>Voluntary Participation</i>	VL	L	VH	VL	VH	VH VL	VH	VH
<i>Privacy Maintained</i>	VH	VH	L-M-H	H	H	L	L-M-H	L-M-H
<i>Stewardship Recognized</i>	VL	VL	M	VL	VH	VL	L-M-H	L-M-H
<b>Government</b>								
<i>Administration Costs</i>	L-M	M	H-VH	H	VH	L-M	H	L-M
<i>Monitoring &amp; Enforcement Costs</i>	H-VH	H-VH	M	H	L-M	L	H-VH	H-VH
<i>Acquisition Costs</i>	VL	VL	H	VL	VL	VH	M-H	L-M
<i>Information Rents (DWL)</i>	VL	VL	H-VH	VL	VL	H-VH	M-H	M
<i>Risk of Habitat Destruction</i>	VH	VH	VL	H-VH	VL	VL-L	VL	VL

Matrix of Economic Incentive Mechanisms and Evaluation Criteria :VH—very high; H—high; M—medium; L—low; VL—very low

**A. Biological Needs**

Based on our reading of the extant literature and our ongoing experience with policy makers, landowners, and scientists, we now consider three policy-orientated biological needs aimed at retiring and enhancing habitat on private property that shelters endangered species.<sup>210</sup> The first criteria is the ability for a mechanism to target specific

210. Retiring habitat refers to land being used only for habitat. It is retired from other productive land uses.

characteristics of the land—whether it be creating one large preserve with minimal edge, preserving a specific plant or animal species, or preserving several small areas for meta-population management. The second criterion is the likelihood of permanent habitat protection. The third criterion is the ability of the mechanism to implement active habitat management techniques. We follow John Terborgh's observation that "logic calls for a strategy that minimizes extinctions, and this is best accomplished with large preserves."<sup>211</sup> Biologists seem to agree with the view that habitat requirements are species specific, and species that are more land sensitive need larger habitat remnants for survival.<sup>212</sup> Fragmentation increases the risk to species when it alters the microclimate of the habitat and when each fragment remains isolated. Following Rodney Smith and Jason Shogren,<sup>213</sup> assume biologists have identified and targeted the private land most suitable to guarantee the safe minimum standard maximum viable population, or minimum acceptable probability of survival.<sup>214</sup> We use these three characteristics as proxies for the biological needs given these land use decisions.

### 1. Biological Needs: Species-Specific Requirements

Habitat and foraging requirements differ across species. Species may require large contiguous habitat reserves or habitat linkages between reserves or both. Species may also require specific shrubs, trees, or habitat types for nesting.<sup>215</sup> Unfortunately, for most listed species, habitat destruction has reduced the amount of remaining habitat to a level below that necessary for the species' survival. In most cases, the remaining habitat is fragmented into several smaller reserves. And although some species thrive on the edge between habitats, biologists believe most endangered species do not.<sup>216</sup> New evidence has overtaken the Leopold "law of interspersions"—more edge, more population

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211. John Terborgh, *Island Biogeography and Conservation: Strategy and Limitations*, 193 SCI. 1027, 1029 (1976). Dr. Terborgh is the James B. Duke professor of environmental science and biology at Duke University.

212. See, e.g., Denis Saunders et al., *Biological Consequences of Ecosystem Fragmentation: A Review*, 5 CONSERVATION BIOLOGY 18, 18-32 (1991).

213. Rodney Smith & Jason Shogren, *Voluntary Incentive Design for Endangered Species Protection*, 43 J. ENVTL. ECON. & MGMT. 169, 169-72 (2002).

214. *Id.*

215. Saunders et al., *supra* note 212, at 19-25; E. Willis, *Conservation, Subdivision of Reserves, and the Anti-dismemberment Hypothesis*, 42 OIKOS 396 (1984); M. Gilpin & J. Diamond, *Subdivision of Nature Reserves and the Maintenance of Species Diversity*, 285 NATURE 567 (1980); R. Whitcomb et al., *Island Biogeography and Conservation: Strategy and Limitations*, 193 SCI. 1030, 1030-32 (1976); A. Higgs & M. Usher, *Should Nature Reserves Be Large or Small*, 285 NATURE 568 (1980).

216. Saunders et al., *supra* note 212, at 19-25.

density—with the proposition that edge effects cause extinction.<sup>217</sup> Edge effects arise from nest parasitism and the penetration of light and wind into the habitat. Species move away from the edge and further into a forest causing a reduction in total core habitat area and lower population persistence.<sup>218</sup>

Disease is another large threat to the survival of endangered and threatened species. For example, the black-footed ferret is affected by canine distemper and sylvatic plague, among other diseases.<sup>219</sup> The black-tailed prairie dog, the primary diet of the black-footed ferret, is also susceptible to canine distemper.<sup>220</sup> If infected by these diseases, an entire colony can be wiped out.<sup>221</sup> For species that are sensitive to disease, the biological goal would include preserving several isolated populations as well as meeting a minimum population size or habitat core area. Management of several meta-populations would be necessary to meet some minimum probability of survival because, as the number of individual populations is reduced, the probability of an epidemic wiping out the species is increased.<sup>222</sup>

Another biological concern that must be addressed when planning and designing habitat reserves is preserving lands that possess key habitat characteristics that the listed species need for survival. For example, each red cockaded woodpecker requires roughly 100 acres of open pine stands for foraging and roosting. For foraging, pines need to be at least 30 years old, while roosting cavities are typically dug into older pines (over 60 years old) infected by red-heart disease.<sup>223</sup> When designing mechanisms for protecting species, each species has its own set of habitat and dietary needs that must be considered in conjunction with the minimal size of the habitat reserve.

An effective conservation strategy must address these biological needs and, in doing so, should view the landscape as a whole. For most listed species, targeting species-specific habitat requirements and coordinating landowner conservation efforts to create larger preserves increases the species' probability of survival. Coordinating conservation

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217. See generally ALDO LEOPOLD, *GAME MANAGEMENT* (1933). See also L. Scott Mills, *Edge Effects and Isolation: Red-Backed Voles on Forest Remnants*, 9 *CONSERVATION BIOLOGY* 395 (1995).

218. See, e.g., Peter D. Vickery et al., *Effects of Habitat Area on the Distribution of Grassland Birds in Maine*, 8 *CONSERVATION BIOLOGY* 1087 (1994).

219. See BLACK-FOOTED FERRET RECOVERY PROGRAM, *BLACK-FOOTED FERRET: FERRET FACTS: THREATS TO THE FERRET*, available at <http://www.blackfootedferret.org/> (last visited Nov. 7, 2003).

220. *Id.*

221. *Id.*

222. *Id.*; see also Saunders et al., *supra* note 212. A meta-population is composed of several smaller populations or colonies of a species.

223. See U.S. Fish & Wildlife Serv., *supra* note 20.

across landowners, so that two or more fragmented habitats of insufficient size are connected to make one large reserve, may also have the added benefit that, in meeting the ESA objective of conserving imperiled species "to the extent practicable," less total acres are required. By coordinating conservation into larger reserves, especially if the edge-to-core ratio is minimized, the minimum acceptable probability of survival for a listed species is met with fewer total acres than if conservation is fragmented.

Zoning, TDR, and conservation banks have a very high potential for targeting species-specific habitat needs and coordinating conservation into larger habitat reserves. The regulator, when employing either a zoning or TDR policy, restricts the land desired for conservation from being used for any purpose other than conservation.<sup>224</sup> The regulator can target specific land and land attributes, which include the edge-to-core ratio of the habitat reserve.

Unlike the command and control approaches of zoning and TDR, conservation banking is effective at preserving specific land attributes and creating one single large habitat reserve, because the bank owner is presented with incentives to create the most effective conservation reserve.<sup>225</sup> The number of credits the conservation bank owner can earn per acre is dependent on the quality of the habitat of the conservation bank, the rarity of the species, and the number of listed species that the bank can support.<sup>226</sup> To maximize the number of credits available for sale, the bank owner has an incentive to create a conservation bank that best meets the species-specific needs by creating one large contiguous habitat area, employing habitat management techniques like prescribed burnings, or locating new conservation banks next to existing habitat.<sup>227</sup>

Subsidies, fee simple acquisition, and PDR easements are all voluntary incentive mechanisms and, as a result, the regulator's ability to target specific land for conservation is reduced.<sup>228</sup> Some landowners may not want to participate in the program at any price, while other landowners may value their land at a higher price than the regulator is willing to pay. Landowners unwilling to participate may limit the effectiveness of these policy instruments at designing one large habitat reserve.

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224. Recall the discussion in sections II.A and II.D.

225. Recall the discussion in section II.5.E.

226. ED1, *supra* note 120.

227. See COUNTY OF SAN DIEGO, MULTIPLE SPECIES CONSERVATION PLAN (2000), available at [http://www.dfg.ca.gov/nccp/mscp/mscp\\_home.htm](http://www.dfg.ca.gov/nccp/mscp/mscp_home.htm) (last visited Nov. 7, 2003); see also ED1, *supra* note 120.

228. Recall the discussion in sections II.C, II.F, and II.G.1.

The benefit of a subsidy program, though limited by the number of willing participants, is that the program can be designed to protect specific attributes of the environment. In general, the process to participate in the program includes an application, a conservation plan, and an initial and final inspection.<sup>229</sup> For many subsidy programs, landowners are not paid until the final inspection has been conducted and approved, providing the government agency considerable project discretion and oversight. Government agencies are able to choose the projects that satisfy some pre-designed evaluation process and pick those projects that meet the goals of the program at the least cost. Examples are the SRFB's two-stage technical evaluation process and the CRP's Environmental Benefits Index.<sup>230</sup>

Impact fees and donated easements are mechanisms providing the regulator with the least control over the land set aside for habitat protection.<sup>231</sup> When an impact fee policy is used, the land that remains undeveloped (or conserved) is the land with a development value less than the impact fee.<sup>232</sup> It is unlikely that the conserved land is the land with the highest quality habitat or that the configuration of the habitat reserve would be such that edge effects are minimized.

The problem with donated easements is that they only appeal to landowners that have a high conservation value because typically landowners are not fully compensated for the lost land productivity. It is possible, albeit unlikely, that all landowners that find donated easements appealing live in the same area and their properties border each other in a manner that creates the largest possible core. It is more likely that habitat reserves would remain fragmented.

## 2. Biological Needs: Permanency

Land worth conserving today because of rich habitat and biodiversity is likely to be land worth preserving indefinitely. This concept holds true if the regulator is seeking to meet the Endangered Species Act objective at least cost—where the minimum acceptable probability of survival is just satisfied.<sup>233</sup> A loss of a relatively small portion of the conserved land could send a delisted species back to an

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229. See examples in Subsidies, *supra* section II.C.

230. See FSAB, *supra* note 90 and accompanying text; see also SRFB 18, *supra* note 57 and accompanying text.

231. Recall the discussion in sections II.B and II.G.2.

232. A landowner will only pay the impact fee if the net return, developed value less the impact fee, is positive. Because the impact fee is required for the land to be developed, if the impact fee is not paid, the land will not be developed.

233. If the regulator only conserves enough land to meet the goal of the ESA, whether that is an acceptable population level or minimum probability of survival, any loss of habitat will result in failure to meet the goal.

imperiled status. Three potential pitfalls for permanency in conservation are short-term contracts, because successive negotiations may not be successful; oversight and future land uses subject to political whims; and contracts subject to conflict, future litigation, and possible reductions in conservation requirements.<sup>234</sup>

Conservation banking is the incentive mechanism best able to guarantee the land remains conserved in perpetuity. Conservation banks, prior to approval by the regulator and sale of the first bankable credit, are required to establish a conservator for the bank, fund the management and maintenance of the bank in perpetuity, and, if the conservation bank falls short of its conservation goal, specify the corrective actions that are to be taken.<sup>235</sup>

PDR easements, donated easements, and TDRs with zoning are designed to conserve land in perpetuity but may be shrouded in uncertainty. A TDR with zoning may be susceptible to political pressure, especially if zoning is the only method to ensure development does not occur in sending zones.<sup>236</sup> Since zoning is not a permanent feature of land, the zoned uses can change when political power changes. Some TDR programs require that landowners place a conservation easement on the title of the land, permanently severing the rights to develop it.<sup>237</sup>

Conservation easements, however, are not a panacea. The easement contract specifies conservation requirements to be permanent. But easements are susceptible to subsequent landowners scrutinizing the easement in search of loopholes by which to increase personal returns to the land. To appease new landowners, the agreements may have to be renegotiated or the conservator may have to force the landowner to comply by taking legal action. It is likely that the landowners gain more flexibility in using the land, meanwhile reducing the conservation commitments of the easement. Over time, conservation commitments may be significantly reduced, rendering the conservation commitment insufficient to achieve its initial goal, much the same as if the land had been developed completely.<sup>238</sup>

Fee simple acquisition and zoning are less likely than easements to conserve land permanently. The ability of fee simple acquisition or zoning to conserve land in perpetuity depends on whether the goals of the government remain constant across time. If the objectives of the government change and species protection becomes less important, the

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234. See Dennis Collins, *Enforcement Problems with Successor Grantors*, in *PROTECTING THE LAND: CONSERVATION EASEMENTS PAST, PRESENT, AND FUTURE* 9 (Julie Ann Gustanski et al. eds., 2000).

235. ED1, *supra* note 120 and accompanying text.

236. Recall the discussion of sending zones in section II.D.

237. Tripp & Dudek, *supra* note 101, at 378-79 (e.g., The Pinelands Commission).

238. Boyd, *supra* note 96, at 20.



land could be reassigned to other uses or sold to fund other government projects.<sup>239</sup> Fee simple acquisition and zoning are subject to lobbying by special interest groups, which may represent a relatively small portion of society. If the interest groups are successful in influencing the governments' objectives, it is likely that the costs to society would outweigh the benefits to the select few that the interest group represents.<sup>240</sup>

The least effective mechanisms for preserving land in perpetuity are subsidies and impact fees. Impact fees, in and of themselves, do not restrict land to conservation but instead keep it from being developed. Subsidies are generally paid on an annual basis and landowners have the opportunity to forego the subsidy and develop their land without repercussion every year. Also, funding the subsidy may prove to be problematic. If the necessary funding is not available, landowners may revert to developing their land.

### 3. *Biological Needs: Implement Active Habitat Management*

The Endangered Species Act prohibits landowners from undertaking activities that harm listed species either directly or indirectly through habitat modification.<sup>241</sup> The ESA does not require landowners to improve the quality of the species habitat on their land but instead serves to conserve habitat.<sup>242</sup> Unfortunately, for many species, simply deterring productive uses of the land is not enough to ensure that a minimum acceptable probability of survival will be met. Species frequently require landowners to restore or create habitat or implement active management practices. Such practices include prescribed burnings, alien species control, reduced use of the land for grazing, or reduced use of pesticides on the conserved land to maintain habitat suitable for species recovery. For example, the leading threats to the California red-legged frog are fragmentation of habitat, degradation of water quality, and the introduction of an exotic species, the bullfrog.<sup>243</sup> The recovery plan for the California red-legged frog calls for restoring

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239. *Id.*

240. Miller, *supra* note 19, at 459-65; Jerold S. Kayden, *Market-Based Regulatory Approaches: A Comparative Discussion of Environmental and Land Use Techniques in the United States*, 19 B.C. ENVTL. AFF. L. REV. 565, 568-74 (1992).

241. 16 U.S.C. § 1532 (2000). "The term 'take' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." A farmer that plows a field that is habitat for a listed species has harmed that species by decreasing its probability of survival.

242. See U.S. FISH & WILDLIFE SERV., TOOLS FOR PRIVATE LANDOWNERS & STATES, at <http://endangered.fws.gov/landowner/index.html> (last visited Nov. 7, 2003) (the U.S. Fish & Wildlife Services's landowner page for incentives to induce landowners into undertaking habitat management on their land).

243. See U.S. FISH & WILDLIFE SERV., THE CALIFORNIA RED-LEGGED FROG, at [http://endangered.fws.gov/features/rl\\_frog/rlfrog.html#threats](http://endangered.fws.gov/features/rl_frog/rlfrog.html#threats) (last visited Nov. 7, 2003).

and creating habitat as well as controlling the threat posed by the bullfrog.<sup>244</sup>

Another example is the Black-capped Vireo. The Black-capped Vireo requires an open brushy area of young small trees and shrubs for its habitat.<sup>245</sup> In the absence of natural fires, landowners must maintain suitable habitat for the Black-capped Vireo through prescribed burning.<sup>246</sup> In a study of 305 listed species, better than 60 percent required active habitat management or habitat restoration.<sup>247</sup>

Active habitat management techniques are incorporated into an incentive mechanism when participation is voluntary, each contractual agreement can be negotiated independently, contracts are of short duration, and assurances of certainty are included in the agreement. Voluntary participation insures that the landowner is being fully compensated for the habitat management requirements set forth in the agreement. Negotiating contractual agreements on a case-by-case basis allows the contract to be tailored to each individual landowner and to each specific species. Negotiations allow greater flexibility in designing an incentive package that satisfies both the landowner and species-specific needs. Shorter contracts necessitate frequent renegotiations, which subsequently permit the provisions of the contract to be altered to meet changing landowner and species needs. Furthermore, the regulator can monitor the landowner's compliance to previous agreements prior to negotiating new agreements. Assurances provide legal remedies in the event the landowner does not fulfill the agreement. Assurances can require the landowner to set aside funding sufficient to insure the long-term active management of habitat.

The largest obstacle to active habitat management is involuntary participation. Involuntary participation is the current approach to endangered species protection and does not provide landowners with any incentives to manage the habitat on their land in the interest of the species. In contrast, the landowner faces incentives to destroy the species and its habitat to avoid the costs of protecting species. The second greatest deterrent is long-term contracts because the longer the elapsed

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244. *Id.* The recovery plan for the red-legged frog calls for the reintroduction of Red-legged frogs into its historic habitat, managing wetlands as critical habitat, and controlling the threats to the Red-legged frog. See also eNature.com's section of Reptiles and Amphibians, at <http://www.enature.com/fieldguide/showSpeciesRecNum.asp?recnum=AR0022> (last visited Nov. 7, 2003).

245. See TEXAS PARKS & WILDLIFE, THREATENED & ENDANGERED SPECIES, at <http://www.tpwd.state.tx.us/nature/endang/animals/birds/bcv.htm> (last visited Nov. 7, 2003).

246. See ENVIRONMENTAL DEFENSE, PROGRESS ON THE BACK FORTY 1, 11-14 (2000), at [http://www.environmentaldefense.org/documents/150\\_backforty.pdf](http://www.environmentaldefense.org/documents/150_backforty.pdf) (last visited Nov. 7, 2003). [hereinafter ED3].

247. *Id.* at 7.

time between the present and the initiation of the management agreement, the greater the likelihood that the landowner violates the agreement in an attempt to increase his gains from his economic activities. Active habitat management is costly, so landowners can increase their economic gains by violating the agreement.

The mechanisms that have a very high potential for implementing active habitat management are subsidies, conservation banking, and fee simple acquisition. Subsidies are voluntary short-term contracts, which are typically negotiated between the landowner and the regulator. Subsidies can be tailored to a specific species and to each individual landowner. Because subsidies are short-term contracts, the regulator can ensure that the landowner has fulfilled the habitat management requirements prior to renewing the subsidy.

Conservation banks are also voluntary and negotiated on a case-by-case basis. The number of credits a conservation bank earns for "resale" depends partly upon the quality of the habitat.<sup>248</sup> Conservation bank owners are required to maintain the habitat in perpetuity. To assure that the conservation bank owners fulfill the terms of their contract, the banking agreement requires that financial assurances be set aside to pay for the management of the habitat in perpetuity.<sup>249</sup> Financial assurances can counter the negative effect of long-term contracts.<sup>250</sup>

Fee simple acquisition in the context of habitat conservation involves a land purchase that places ownership and responsibility of managing the land on the government. Implementing habitat management is straightforward and requires the appropriate government agency be notified of the management requirements. A fee simple acquisition results in a very high potential for active habitat management to occur on the purchased land.

Easements, both PDR and donated, are voluntary long-term contracts negotiated between the landowner and the regulator. Easements are similar to subsidies in their ability to implement active habitat management; except that, unlike subsidies, easements are long-term contracts.<sup>251</sup> Landowners receive payment in full at the time of contract initiation and must satisfy the terms of the agreement in perpetuity. Fulfillment of active habitat management required in the contract depends on the integrity of the landowner, the landowner's conservation value, and the regulator's monitoring and enforcement of

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248. See CRA, *supra* note 34.

249. See *supra* note 141 and accompanying discussion.

250. By setting aside financial assurance sufficient to manage the conservation bank in the event the original bank owner goes insolvent, the means to actively manage the conserved habitat are in place.

251. Easements are typically contracted in perpetuity. See Easements, *supra* section II.C for further discussion.

the agreement. In any event, as time passes, active habitat management is likely to diminish as the encumbered land changes ownership, the opportunity cost of habitat management increases, or the regulator relaxes the monitoring and enforcement of agreements.

TDRs, zoning, and impact fees all have a very low ability to require landowners to undertake active habitat management because they force landowners to conserve their land involuntarily. Involuntary participation creates resentment and disincentives for landowners to undertake activities that enhance the habitat on their land. Zoning and impact fees both require landowners to conserve habitat without compensation for lost productivity. Any habitat improvements undertaken by the landowner increase his out-of-pocket expenses.

Landowners do receive some compensation with a TDR incentive mechanism. Owners of land in the sending zone sell their TDRs to developers in the receiving zone, but the compensation is independent of the opportunity cost of the land.<sup>252</sup> Improving the quality of the habitat only increases the landowner's opportunity cost without affecting his compensation. A landowner incurs fewer opportunity costs by not undertaking active habitat management.

In sum, there is no simple answer as to which mechanism dominates for biological needs—each has positives and negatives. The answer depends on the development pressure in the area. If development pressure is strong, as in southern California, conservation banking works well. Banking conserves habitat prior to development, induces bank owners to invest in habitat quality, makes development pay for conservation, and sets aside money for perpetual bank management (low monitoring and enforcement costs). Banking, however, may have high administrative costs due to the application process. If one is considering an area with little development pressure, a PDR easement might be best. PDR allows one to target desired land. A PDR is also less expensive than fee simple acquisition since one is only buying the right to develop. Finally, a PDR keeps a landowner on the land and tailors each agreement to the landowner and the species' habitat needs. The downside is that PDR easements in perpetuity require monitoring and enforcement forever, which could be costly, especially with subsequent landowners.

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252. See Mills, *supra* note 96, at 73-74. The current approach to TDRs creates a situation where supply is perfectly inelastic—a given number of permits are allocated to the landowners whose land has been zoned for conservation. The market price is driven by the willingness to pay for permits, which is the developed value of the land zoned for development.

## B. Landowner Interests

We consider three basic landowner concerns identified over the years through reading the literature and our informal and formal discussions with ranchers, policy makers, developers, and farmers. While this list is not all-inclusive, many landowners have a common set of goals—they want their participation to be voluntary, their privacy maintained, and their stewardship toward the land recognized and acknowledged.

### 1. Landowner Interests: Voluntary Participation

As we argued earlier, designing mechanisms that allow landowners to voluntarily participate, rather than forcing landowners to participate through some type of command and control mechanism, alters the landowner's incentives.<sup>253</sup> If the landowner is compensated for habitat conservation, and the compensation is dependent on the quality of the habitat, then landowners are provided with the incentive to conserve their land and to do so without force. Zoning and TDR policies predetermine which land is to be conserved and then force those landowners into conserving their land. For these mechanisms, voluntary participation is almost non-existent.<sup>254</sup> Fee simple acquisition can also be non-voluntary when the government uses its eminent domain to force the landowner to sell his or her land. Fee simple acquisition can also occur in situations in which the landowner voluntarily sells his or her land to the government agency or other conservator.

When an impact fee policy is used, landowners who choose to develop their land are required to pay an impact fee. A landowner does have the choice to not pay the impact fee, but that entails an opportunity cost of foregoing development of his or her land. Only landowners with a conservation value in excess of the opportunity cost of foregone development choose to conserve their land voluntarily. Regulatory policies of subsidies, conservation banking, and PDR and donated easements all have a very high rank as being voluntary for landowners. Landowners that create conservation banks do so voluntarily with the expectation of turning a profit.

Subsidy programs typically require landowners to apply for the subsidy and to then satisfy specified criteria. The number of applications can exceed the accepted conservation projects. If the incentives are not sufficient for the landowner, the landowner has the choice of not

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253. Command and control means the regulator tells the landowner what to do and then uses financial and criminal penalties to control the landowner's actions.

254. Richard A. Epstein, *A Conceptual Approach to Zoning: What's Wrong with Euclid*, 5 N.Y.U. ENVTL. L.J. 277, 282-85 (1996); see also Boyd, *supra* note 96, at 1-5.

applying. PDR and donated easements require landowner and conservator to negotiate contracts, which specify the obligations and requirements of both parties. If the contract is not satisfactory to the landowner, the landowner can abort negotiations and not conserve habitat on her land.

## 2. Landowner Interests: Privacy Maintained

Most landowners in the United States want to preserve their right to exclude persons from trespassing on their land. Also, landowners want to minimize the rights of a third party from legitimately, through contractual agreement or other arrangement, entering their land. Policies that do not alter or split the property rights to the land are more effective at maintaining privacy. When the property rights remain intact, confusion over who has what rights is avoided.

Impact fees maintain the rights to privacy most effectively because upon payment of the impact fee compliance to the policy is satisfied for developed properties. For properties not developed, landowners maintain the right to exclude government regulators from entering their property. Zoning, like an impact fee policy, also maintains a very high level of privacy. The landowner maintains all rights to the land and can restrict access to his or her land.

Conservation banking and TDR mechanisms for conserving habitat are highly effective at maintaining the landowner's privacy. Although both mechanisms allow the government regulator access to the land to monitor and enforce the contractual agreements, access is typically specific.<sup>255</sup> For subsidies, PDR easements, and donated easements, the ability to maintain privacy is dependent on the negotiated contracts or the rules of the program. Some subsidy programs require the landowners to permit public access to their land, although the landowner does have the ability to exclude specific individuals.<sup>256</sup> Easements, however, sever the property rights and split them between two parties. The landowners' ability to protect their privacy hinges on the contractual agreement and may be low, medium, or high.<sup>257</sup> When the government purchases land through fee simple acquisition, the land becomes the property of the public.

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255. See *supra* note 141 and accompanying discussion. Rights of access are specified in the banking agreement or through the permit allocation of TDRs.

256. See HIP, *supra* note 31.

257. See the discussion on Easements, *supra* Section II.G.

### 3. Landowner Interests: Stewardship Recognized

Is the landowner's effort to preserve or enhance the habitat on their land acknowledged? Recognition of past efforts to protect the land can be an important consideration when evaluating a habitat conservation mechanism. Acknowledgement can take many forms, including public or financial awards, but must create an incentive for the landowner to preserve or enhance the habitat on their land. Conservation banking rewards bank owners for good stewardship by increasing the number of credits that the bank owner can sell to offset development. The bank owner enhances the property, increasing the quality of the habitat or the number of listed species and, as a result, increases the number of credits that can be sold, which increases the revenue to the bank owner. Subsidies also reward stewardship, but less effectively. The subsidy policy can prescribe that the landowner restore or create habitat or the policy might only be a mechanism to keep the land from being developed. Subsidy payments hinge on satisfactory completion of the subsidy agreement.<sup>258</sup>

PDR and donated easement contracts may or may not specifically recognize that the landowner has undertaken habitat management. If the contract specifies the landowner has maintained the habitat on the land in the past, it could affect the extent to which the landowner meets his or her contractual obligations in the future. Some NGOs, such as the Land Trust Alliance, spotlight owners of easement encumbered land, recognizing stewardship, but this is less likely to occur on government owned lands. Impact fees, zoning, and TDR policies do not necessarily provide landowners with a stewardship incentive to enhance and maintain the habitat on the land.<sup>259</sup> The fee simple purchase mechanism scores very low for the recognition criteria because the land is in public hands, and people may see the responsibility of maintaining the land as the government's problem.

### C. Regulatory Concerns

We consider five general categories of regulatory concerns associated with implementing an incentive scheme. These five categories

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258. See the discussion on Subsidies, Section II.C. Note in particular California's Timber Tax Credit, *supra* note 31 and accompanying discussion, and Washington's Salmon Recovery Funding Board, *supra* note 31.

259. See Robert Innes et al., *Takings, Compensation and Endangered Species Protection on Private Lands*, 12 J. ECON. PERSP. 35 (1998); see also Boyd, *supra* note 96, at 20-24.

are administrative costs, monitoring and enforcement costs, acquisition costs, information rents, and risk of habitat destruction.<sup>260</sup>

### 1. Regulatory Concerns: Administrative Costs

Administrative costs are expenditures necessary to establish conservation plans, process applications, establish markets to facilitate trades between suppliers and demanders of tradable development rights and bankable credits, process and maintain records for property right transfers and land use restrictions, and staff and fund programs that maintain government owned conservation lands.<sup>261</sup> Administrative costs increase as the needed staff, reporting requirements, and other various accounting needs increase.

Administrative costs are lowest for the status quo—zoning. Zoning ordinances have been used to control the shape of growth for a century.<sup>262</sup> The infrastructure necessary to administer a zoning conservation policy is already in place. Administrative costs for zoning ordinances increase as the government planning agency implements more flexible zoning policies. Two examples of flexible zoning include cluster zoning<sup>263</sup>—dividing the land into a high density development cluster and an open space cluster, and performance zoning<sup>264</sup>—providing a certain level of conservation prior to approval of a development plan. Flexible programs usually increase the administrative costs to the local government and subject the developer to more governmental control due to the project-by-project review process.<sup>265</sup> Impact fees, like zoning, have low administrative costs because the infrastructure necessary to implement an impact fee policy is already established.<sup>266</sup>

Fee simple acquisitions have low to medium administrative costs. The costs result from the need to manage and maintain land once acquired. Government agencies responsible for managing these lands are largely intact, and only a minimal increase in staff may be necessary. Like fee simple acquisition, donated easements also have low to medium

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260. Again our choices of criteria come from summarizing the existing literature, our discussions with policy makers, and our experience in policy decisions.

261. See ED1, *supra* note 141, and accompanying discussion.

262. *For the Record: Landmarks in Planning History, the Case That Put Zoning on the Map*, at <http://www.planning.org/info/landmarks/record.htm>. Zoning became a legally acceptable method for controlling land uses when the U.S. Supreme Court ruled in favor of the Village of Euclid in *Village of Euclid, Ohio v. Ambler Realty Co.*, 272 U.S. 365 (1926).

263. UCLCC, *supra* note 22, at 39.

264. *Id.*

265. Miller, *supra* note 19, at 462-63.

266. Impact fees are already being used in most all communities—for example, development projects are charged an impact fee to pay for the construction of new roads necessary to control congestion.



administrative costs because the infrastructure necessary to oversee a donated easement policy is already in place. A large portion of the administrative responsibility for donated easements rests with the IRS, which has an adequate budget to deal with the responsibility of donated easement oversight at a minimal to zero impact on staffing requirements. While donated easements must still be negotiated between the landowner and a conservator, the administrative costs to the regulator are small because the conservator can be an IRS approved nonprofit conservation organization.<sup>267</sup>

Conservation banks are at the other end of the spectrum—high administrative costs. Conservation banks require the regulator to staff the oversight of an extensive application process and establish a market for and track the transfer of bankable credits.<sup>268</sup> PDR easements, subsidies, and TDRs also have high administrative costs. For PDR easements, contract negotiations constitute the bulk of the administrative costs. The costs of contract negotiations are high because PDR easements result in the landowner and the regulator having joint ownership in the property. Some agreements on how to split the property rights may require complex and costly negotiations. Subsidies also have high to very high administrative costs because subsidy programs typically require the landowner to submit an application and to satisfy specific requirements. The regulator incurs administrative costs to evaluate applications and to insure that the specified requirements are met. And as the application and review process becomes more extensive, administrative costs increase. By some estimates, administrative costs for subsidy mechanisms have been in the range of ten to 30 percent of every dollar spent.<sup>269</sup> Finally, TDRs involve land allocated for conservation through zoning. Here, administrative costs come from the need to establish a market to facilitate trades and to record the transfer of TDRs. Record keeping helps insure that, once a landowner has traded (sold) away the development rights in the land, the land is designated for conservation thereafter.<sup>270</sup> One can imagine that if records are not maintained, the landowner could perhaps lobby for future zoning changes and, if successful, develop his land.

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267. INTERNAL REVENUE SERVICE. PUB. NO. 526, *supra* note 194.

268. See ED1, *supra* note 120, at 23-26.

269. Robert Innes, *The Economics of Takings and Compensation When Land and Its Public Use Value Are in Private Lands*, 76 LAND ECON. 195, 205-12 (2000).

270. As stated above, the administration costs of zoning are low. See *supra* note 263 and accompanying text.

## 2. Regulatory Concerns: Monitoring and Enforcement Costs

Administrative costs arise from implementing the incentive program. In contrast, monitoring costs are the costs that the regulator accrues in insuring that land use restrictions are not being violated and that contractual conservation agreements are being upheld. When violations of land use restrictions or contractual agreements occur, enforcement costs accrue in correcting the situation. Monitoring and enforcement obligations are perpetual and must be funded annually.

Fee simple acquisition has low monitoring and enforcement costs. Inherent in the purchase of the land is the right to control acceptable land uses and the costs of monitoring and enforcement may be limited to preventing the public from misusing the land. Conservation banking has low to medium monitoring and enforcement costs. The costs to monitor and enforce agreements are low because the banking agreement stipulates reporting and monitoring criteria, establishes a bank manager, and specifies remedies for violations of the agreement.<sup>271</sup>

Conservation banks also combine many developers' mitigation requirements, reducing the number of mitigation projects requiring regulatory oversight. Because the sole purpose of a conservation bank is to earn profits through the provision of conservation, bank owners are unlikely to undertake activities that diminish their potential profits.<sup>272</sup>

Higher monitoring and enforcement costs are found with incentive mechanisms that allow the landowner to remain on the land and retain complete or partial property rights. The magnitude of the costs to monitor and enforce conservation requirements is related to many factors including the time frame in which conservation payments are made to the landowner, the length of conservation agreements, and the landowners' range of permissible land uses. Spreading landowner compensation payments over many periods, rather than paying the landowner one lump sum, is likely to reduce the costs of monitoring and enforcing agreements. The landowner must prove compliance on regular time intervals to receive the periodic conservation payment.

Likewise, the shorter the contract duration, the lower the monitoring and enforcement costs are likely to be. Monitoring and enforcement costs tend to increase in relation to the lapse of time between the present and the time of agreement initiation increases.<sup>273</sup> Furthermore, with longer contracts, the probability that the land will transfer ownership increases. As subsequent landowners take control of

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271. See ED1, *supra* note 120, at 23-26.

272. Linda Fernandez & Larry Karp, *Restoring Wetlands through Wetlands Mitigation Banks*, 12 ENVTL. & RESOURCE ECON. 323, 323-28 (1998).

273. Boyd, *supra* note 96, at 20-25.

the land, the likelihood that conservation agreements will be upheld decreases, and the costs of monitoring and enforcing agreements increase.

A larger set of permissible land uses can have either a positive or negative effect on the magnitude of monitoring and enforcement costs. On the positive side, as the landowner's freedom to use her land increases the need to violate the agreement decreases, thereby reducing enforcement costs. In contrast, a higher number of acceptable land uses provides the landowner with greater opportunity to intentionally or unintentionally misinterpret the agreement. Whether the positive or negative effect of landowner freedom is of more significance is uncertain.

Longer contracts that compensate landowners with a one-time lump sum payment, such as donated and PDR easements, tend to have larger monitoring and enforcement costs. To ensure its interests are being fulfilled, the conservator must regularly monitor the landowner's actions. As ownership of the PDR land changes, monitoring and enforcement costs will likely increase.<sup>274</sup> Subsidies have shorter length contracts and periodic (typically annual) payments. These factors cause subsidies to have lower monitoring and enforcement costs, although the costs still exceed those of conservation banking and fee simple acquisition.

Involuntary incentive mechanisms also have high monitoring and enforcement costs, such as zoning, TDRs with zoning, and impact fees, which force strict rules on landowners. Some restricted land uses that require government permits, like the construction of an office building or house, may be easily monitored. Other restricted land uses, such as cultivating crops or clear cutting trees, may require the regulator to engage in more active and costly monitoring and enforcement activity.

For example, a TDR with a zoning policy has high monitoring and enforcement costs. Land restricted from development must be monitored to ensure that landowners do not undertake prohibited activities. Also, developers must be monitored to ensure that the density of development does not exceed the permissible level, zoned plus TDRs. If landowners and developers undertake prohibited activities, the regulator must decide whether and to what degree it enforces the restrictions, including evaluation of appropriate penalties.

The key point is that both voluntary and involuntary incentive mechanisms allowing the landowner to stay on the land require the regulator to incur monitoring and enforcement costs. Compensation paid in short-term intervals is possibly the only method of reducing these costs.

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274. See generally NATIONAL RESEARCH COUNCIL, *SETTING PRIORITIES FOR LAND CONSERVATION* (1993).

### 3. Regulatory Concerns: Acquisition Costs

Acquisition costs are the actual cash outlays required to purchase or otherwise retire land for species protection. Land can be retired through purchase of either full or partial interest in the land or by a payment that retires the land for a specified term.

Both fee simple acquisition and subsidies have very high costs of retiring land for conservation purposes. The costs for fee simple acquisition are high because acquiring land in its entirety, with all its rights intact, is expensive and requires the greatest initial amount of financial resources of all eight mechanisms considered here.

The acquisition costs associated with subsidies are less in the short run. In the long run, however, subsidy acquisition costs may exceed those of fee simple acquisition. The primary explanation for this distinction is that subsidies generally only restrict land activities for a limited time period.<sup>275</sup> The annual payment of the subsidy is less than the costs of purchasing the fee simple title. But if the land is continually conserved through subsidies, the sum of payments over time is likely to exceed the cost of purchasing the land outright. The increased cost for a subsidies mechanism could be viewed as the price of flexibility. Subsidies provide more flexibility to both the government regulator and the landowner. At the fruition of the subsidy, both the regulator and the landowner can reevaluate their options and determine their best course of action for the next time period. The regulator may prefer a subsidy if limited funds make it impossible to meet the ESA goal with other incentive mechanisms. The landowner may prefer more flexibility if she is uncertain about future opportunities. Regardless of who prefers more flexibility, conserving land in perpetuity via a subsidy is likely to cost more than using fee simple acquisition.

PDR easements require the regulator to incur acquisition costs, but the acquisition costs of PDR easements are less than those for fee simple acquisition because the regulator is only purchasing partial interest in the land. PDR easement acquisition costs have been estimated to be in the range of 20 to 90 percent of the costs of fee simple acquisition.<sup>276</sup>

Donated easements are funded through federal tax deductions, which means that landowners typically receive less than the fair market value.<sup>277</sup> Donated easements require less actual cash outlays than do PDR

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275. See the discussion on Subsidies, *supra* section II.C.

276. Boyd, *supra* note 96, at 30. The large range in easement valuations is largely due to the uncertainty surrounding future allowed land uses. There must be a reasonable probability that the land will be adapted to the future land use for it to affect the easement value.

277. See the discussion on Donated Easements, *supra* section II.G.2

easements. The tax deduction represents a decrease in the federal government's annual budget, funds that must be spread across all worthy projects. Funding a donated easement program reduces the funds available for all federal government programs. A local regulator, using a donated easement mechanism, can conserve land with minimal cash outlays.

Zoning, TDRs with zoning, conservation banking, and impact fees all have relatively low acquisition costs. Under an impact fee scheme, a government funds the acquisition costs by requiring developers to pay a fee to offset the impact of their development. Likewise, TDRs with zoning and conservation banking involve conservation funded by developers through the purchase of development rights or bankable credits. Again, similar to biological needs, no clear cut incentive scheme emerges that dominates all the others for landowners in the general sense.

#### 4. Regulatory Concerns: Information Rents

Information rents are costs incurred by the regulator. Information rents occur when landowners are paid more than their opportunity cost of the lost land simply because the landowner knows more about his land than does the regulator.<sup>278</sup> These costs are most prominent when the regulator is confined to conserving specific land parcels and required to use voluntary incentive mechanisms. Landowners can act strategically. The landowner, knowing that the regulator must acquire his land to satisfy the conservation objective, is able to extract from the regulator an extra payment that exceeds his or her actual opportunity cost. The landowner would have sold for less. When the landowner earns information rents, society pays too much for its conservation. The incentive mechanism can be perceived as inequitable from society's point of view.<sup>279</sup>

For zoning, impact fees, conservation banking, and TDRs with zoning, information rents are very low or nonexistent. Information rents are absent for zoning and impact fees because landowners are not compensated for conserving land. With the latter two, conservation banking and TDRs with zoning, compensation is determined by the market. A landowner's private information is reflected in the market price and information rents are eliminated.

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278. See Smith & Shogren, *supra* note 213. Opportunity cost is the next best alternative foregone. In the case of land, it is the value assigned to the activity that land would be used for in the absence of endangered species protection.

279. *Id.* If society is paying information rents, then society is paying a price greater than the true value of the land.

Of the four completely voluntary incentive mechanisms, donated easements have the smallest potential for information rents. Subsidies and fee simple acquisition have high to very high potential for information rents and PDR easements have a medium to high potential for information rents. The ability of landowners to earn information rents is dependent on the value of the compensation paid to the landowner and the ability of the landowner to act strategically in negotiating for compensation. Donated easements have the lowest compensation and the rules regulating the use of donated easements are well defined, reducing the possibility for the landowner to act strategically. Compensation under a PDR easement is greater than under a donated easement. Because compensation is negotiated on a case-by-case basis, the opportunity exists for the landowner to strategically overstate the asking price. Like PDR easements, the fee simple acquisition incentive mechanism provides the landowner with the opportunity to act strategically. Fee simple acquisition is unlike PDR easements in that full interest rather than partial interest in the land is being purchased. Landowners receive greater compensation. Because compensation is greater and the opportunity for strategic behavior is equal, information rents are greater for fee simple acquisition.

With a subsidy incentive mechanism, unlike the other three voluntary mechanisms, contracts and payments are negotiated on a regular basis. The opportunity for strategic behavior is present for subsidies just as it is for PDR easements and fee simple acquisition. If subsidies are negotiated annually, the landowner has the opportunity to earn information rents every year.<sup>280</sup> The accumulation of information rents over time could be substantial and, in present value, may exceed the information rents of fee simple acquisition.

##### *5. Regulatory Concerns: Risk of Habitat Destruction*

When involuntary incentive mechanisms are used, government regulations impose uncompensated out-of-pocket expenses onto landowners. The quality of land available for conservation could be affected if the landowner perceives that the probability of being regulated increases with land quality, which is a likely scenario.

Zoning has high economic deadweight losses if landowners develop their land hastily to escape the high costs that a potential zoning

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280. *Id.*; see also Rodney B.W. Smith & Jason F. Shogren, *Protecting Species on Private Land*, in *PROTECTING ENDANGERED SPECIES IN THE UNITED STATES: BIOLOGICAL NEEDS, POLITICAL REALITIES, ECONOMIC CHOICES* 326-30 (Jason F. Shogren & John Tschirhart eds., 2001).

rule would impose.<sup>281</sup> Development that supersedes zoning on environmentally rich land can create a loss of conservation benefits. Landowners that are subject to TDRs with zoning may also face the incentive to prematurely develop their land. Because landowners zoned for conservation under a TDR with zoning incentive scheme are, at the least, partially compensated (the payment received from selling the TDRs may not fully compensate the landowners for the lost opportunity cost of their land), the incentive to destroy land is less than that for zoning alone. The landowner destruction associated with impact fees depends on if the magnitude of the impact fee is set on the habitat quality of the land. If the impact fee is set in conjunction with the conservation value, landowners have an incentive to destroy habitat to escape expensive impact fees.<sup>282</sup> For voluntary incentive mechanisms, landowners are fully compensated and the incentive to destroy habitat is low to very low.

#### IV. CONCLUDING REMARKS

We conclude by highlighting what we have learned from our review of the economic principles underlying the set of eight incentive mechanisms. First, market instruments<sup>283</sup> that have been praised for the ability to control air pollution at minimum costs are not as effective for protecting habitat for two reasons. No uniform system of measuring biodiversity exists; land has heterogeneous habitat quality and, as a result, market systems have to be combined with other regulatory tools like zoning to be effective. In addition, development results in permanent destruction of habitat, giving the regulator only one chance to get it right. Zoning would be effective on its own if political objectives, economic circumstances, and environmental preferences never changed, which is highly unlikely.

Second, voluntary mechanisms, like fee simple acquisition, easements, conservation banking, and subsidies, are an effective and flexible method for targeting low cost land with high quality habitat. Extracting a landowner's private information, however, regarding both habitat quality and his appreciation for the land use value is expensive and politically charged.

Third, the incentive mechanisms of conservation banking, subsidies, and easements can be designed to induce landowners to both conserve their land and to invest in the conservation value of their land.

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281. Recall that economic deadweight loss implies money lost due to inefficient rules and regulations imposed on an economic system.

282. Innes, *supra* note 269.

283. For example, TDRs and impact fees.

This is important when habitat needs exceed the quantity of quality habitat and when degraded habitat must be restored to meet the ESA objectives. It also matters when creating or restoring a habitat corridor can expand habitat fragments.

Fourth, conservation approaches, like conservation banking and TDRs, can be designed to satisfy both state and federal land use regulations. There are many players involved in various habitat conservation efforts, including the U.S. Fish and Wildlife Service (administering the ESA), the Army Corps of Engineers (administering portions of the CWA), state fish and wildlife agencies, and other affected state, local, and federal entities.<sup>284</sup> Bringing these entities together can reduce the regulatory burden placed on both landowners and affected agencies. The landowner receives regulatory certainty from such cooperative relationships. The regulator can also benefit from interaction among the players. Examples of regulator benefits are more access for monitoring land use restrictions and well-defined recourse in the event the landowner fails to meet stipulations in their agreements.<sup>285</sup>

Sixth, mechanisms such as donated easements can reduce a regulator's outlays by creating incentives for land trusts and other nonprofit organizations to work together and share the costs of conservation. Cost sharing works in both directions. Land trusts can reduce their costs by purchasing fee simple title, placing a conservation easement on the land they then hold, and donating the land to the government to manage.

A final observation is that, in light of our evaluations, none of the incentive mechanisms manage to outshine all the others. Factors such as development pressure, funding, the range of land quality, quantity of suitable habitat, the range of land values, and types of landowners should be considered in determining which mechanism(s) would meet the regulator's objectives most efficiently.

When markets have many buyers and sellers such that the developmental pressure in the region is strong, conservation banking is the preferred mechanism for species protection. Conservation banking consolidates the conservation requirements of many landowners and places the requirements in the hands of one individual or organization,

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284. See COUNTY OF SAN DIEGO, *supra* note 227. In designing multiple species conservation plans in California, representatives from all affected agencies are invited into the designing process. The representatives in the County of San Diego Multiple Species Conservation Program are the U. S. Fish and Wildlife Service, the California Dep't of Fish and Game, and the County of San Diego.

285. *Id.*; see County of San Diego Multiple Species Conservation Program, *Implementing Agreement by and between United States Fish and Wildlife Service, California Department of Fish and Game, County of San Diego*, 37-40 (Mar. 17, 1998), available at [www.co.san-diego.ca.us/cnty](http://www.co.san-diego.ca.us/cnty) (last visited Nov. 7, 2003); see also *supra* note 141 and accompanying text.



whose sole objective is to make money by providing conservation. Furthermore, because their profits depend on the quality of the conserved parcel, as well as minimizing the costs of conservation, conservation reserves will likely satisfy the biological criteria and reduce many of the long-term government costs.

When markets have few buyers and sellers, no incentive mechanism stands out as the clear favorite. Each mechanism has its own strengths and weaknesses. If we assume that the government prefers a voluntary incentive mechanism over a command and control mechanism, then the field of potential policies is limited to easements, fee-simple acquisition, subsidies, or a combination of these mechanisms, which are likely to impose similar costs on the government. The landowner requirements are similar as well. Biological criteria have one important difference—the conservation reserve's permanency. Subsidies are by far the least permanent, whereas easements have the potential for the greatest permanency. The problem with easements is that there is no guarantee—landowners may lack sufficient incentives to continue to uphold the contract in the future. A possible remedy to this situation would be to create a policy that combines easements (both PDR and donated) with subsidies.

In addition, the conservator could purchase the development rights in the land initially, and negotiate other land use restrictions. Some of these restrictions, in particular land management and maintenance requirements, could be tied into an annual subsidy negotiated periodically. The easement portion would provide permanence, while the subsidy would give the landowner and the conservator some flexibility. The number and types of landowners that this policy would appeal to would likely be greater than the appeal generated by applying mechanisms independently. The potential to create a larger preserve should increase as a result, and because landowners are being paid an additional annual subsidy, for which they can negotiate, the permanence of the conservation should be more secure.

For government costs, monitoring and enforcement costs are likely to be lower for the same reason that the conservation reserve is likely to be more permanent. Acquisition costs are likely to increase; however, the cost of the easement initially may decrease because of the stream of subsidy payments that follow. Administration of the policy would maintain a similar approach as did a subsidy policy and costs continue to be very high. Information rents are higher because the landowner has two pieces of private information from which to extract rents—the personal value of the easement and the personal value of the annual subsidy.

Economic incentives matter for habitat conservation because private lands are critical for successful ESA implementation.<sup>286</sup> Attempts to reauthorize the Act have focused on altering the incentives to private landowners by creating financial incentives that shift the burden of conserving habitat from the landowner to a government agency or a private organization. If compensation plans are to work cost-effectively, they should be voluntary for the private landowners and flexible enough to accommodate a species' biological need for habitat reserves of varying sizes. The plans should also provide incentives for the landowner to profit from his or her private information about the land and account for the opportunity costs of the funds used to compensate acre set-asides.

This suggests that, to succeed at protecting species at risk in a cost-effective manner, incentive mechanisms will have to be used in combination. Combining incentives into a cohesive strategy for species protection can be complex depending on the conservation goal and the desired degree of efficiency. We must ask ourselves the basic questions: How great is the risk we face? What will the solution cost and how effective will it be? and Could the money be better spent? Reducing the cost of achieving species protection goals increases the demand to achieve these goals and reduces the resistance to achieving them. Our goal herein has been to illustrate how economic insight can help lower the cost of doing society's business. Evaluating the range of incentive options that exist within the context of government regulation and stakeholder-participation processes can allow all of us to enjoy efficient and effective species protection.

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286. Michael J. Bean & David S. Wilcove, *The Private-Land Problem*, 11 CONSERVATION BIOLOGY 1, 1-2 (1997).