The Law and Economics of Habitat Conservation: Lessons from an Analysis of Easement Acquisitions

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Abstract

There is a growing interest in incentive-based policies to motivate conservation by landowners. These policies include full- and partial-interest land purchases, tax-based incentives, and tradable or bankable development rights. Using legal and economic analysis, the paper explores potential pitfalls associated with the use of such policies. Incentive-based policies promise to improve the cost effectiveness of habitat preservation, but only if long-run implementation issues are meaningfully addressed. While we compare conservation policies, particular attention is devoted to the use of conservation easements and in particular a set of easement contracts and transactions in the state of Florida. The easement analysis highlights the importance of conservation policies' interactions with property markets, land management practices, and bureaucratic incentives. Specific challenges include difficulties associated with the long-term enforcement and monitoring of land use restrictions, the lack of market prices as indicators of value for appraisal, and the way in which incentives target specific properties for protection.

Key Words: habitat conservation, conservation easements, land use policy

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1. INTRODUCTION

Conflict between land development and the need for species and habitat preservation is likely to increase in the years ahead as demographic and economic changes fuel pressure to develop currently undeveloped lands.[1] In turn, the growing scarcity of natural habitats will heighten the social value of preservation. Thus, there is a growing need for policies and institutions that can negotiate this conflict by balancing the requirements of economic development with the social benefits of species, habitat, and open-space conservation.

At its heart, the conflict between development and conservation is one between the public interest in preservation and the private interests that must be sacrificed if preservation is to be achieved. Simple resolution is complicated by the fact that laws governing land use embody, rather than resolve, the conflict. Consider the Endangered Species Act (ESA)[2] -- perhaps the most notable statutory safeguard against unrestrained development--and the constitutional prohibition against governmental "taking" of private property without compensation under the Fifth Amendment.[3] The ESA affords some protection to animal and

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[1] It is worth noting that this view is not universally held. There are some who argue that the long-run trend may be toward less, rather than more, intense pressure on natural habitats as technological improvements reduce society's dependence on land for the production of wealth. *See* Paul E. Waggoner et al., *Lightening the Trend of Population on the Land: American Examples*, 22 Population & Dev. Rev. 531 (1996). Regardless of one's views on the *long run* trend, however, it is reasonable to express concern, first, about the irreversible losses that may occur before these technological improvements are realized, and second, about habitat loss in areas where development will occur in any event.

[2] 16 U.S.C. §1531-1544.

[3] A recent Supreme Court ruling affirmed the federal government's authority under the ESA to regulate the destruction of habitat and, by extension, use of privately-owned land to protect the habitat of endangered species. *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon*, 515 U.S. 687 (1995). See Michael Bean, *The Endangered Species Act and Private Land: Four Lessons Learned from the Past Quarter Century*, 28 Env't. L. Rep. 10701(1998) for an analysis of the ESA's legal and practical impact, with an emphasis on its weakness as a conservation safeguard.

Contemporary takings cases, such as Keystone Bituminous Coal Ass'n v. DeBenedictis 480 U.S. 470 (1987) or Penn Central Transportation Co., v. New York City, 438 U.S. 104 (1978) employ an ad hoc factual inquiry approach, defining some factors ("diminution of value," "nuisance") that can result in compensation for the property owner. The most important recent environmental case, Lucas v. South Carolina Coastal Council,505 U.S. 1003 (1992) (holding that the state regulation in question violated the Fifth Amendment since no productive or economically beneficial use of the land was permitted), also exhibits this factor-based approach.

plant species threatened by changes in land use.[4] Under the current law, endangered species are designated as public trust resources, and thus not subject to private ownership. But while wildlife is a public resource, wildlife habitat most frequently is not. Land is instead a commodity that can be owned by, and traded between, private parties. Government regulation to protect endangered species poses a clear threat to the financial value of this commodity. This value is protected by the Constitution's safeguards against uncompensated takings of property. Thus, biodiversity conservation in our democracy, even at the most fundamental legal level, cannot avoid the conflict between public and private interests.

Given this conflict, the challenge is to design policies and institutions that will most effectively balance private and public needs. Direct regulation, such as that embodied in the ESA, is one such option. In one sense, however, land use regulation is an "extreme" option in that it does a relatively poor job of weighing (or compensating) private interests. Cost effective, and politically pragmatic, land use policies require a more effective weighing of private interests than direct regulation can provide. For this reason, there is growing interest in flexible, "market-based" incentives to motivate conservation by landowners.[5] These incentives include full- and partial-interest land purchases, tax-based incentives, and tradable or bankable development rights. The key to these policies is that they use financial incentives to promote non-coercive development restrictions.

In this paper we explore the economic and legal issues that arise with the use of such flexible land use policies. Analysis of, and experimentation with, these tools is essential if we are to maximize the amount of protection possible given scarce conservation dollars. The analysis is meant as a critical review. That is, we devote significant attention to potential problems that arise with the use of flexible conservation mechanisms. It must be emphasized, however, that this critical posture is borne of a desire to make flexible policies as effective as possible. It is in no way an endorsement of the alternatives--i.e., doing nothing or relying exclusively on direct land use regulation. The weakness of those alternatives is simply more

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[4] Most species listed as threatened or endangered under ESA are in that condition, at least in part, due to habitat loss. Biologists generally agree that biodiversity is eroding at the species and community levels, and probably at the genetic level as well. The principal cause of this erosion is the conversion of natural communities to other land-uses. Such conversions can destroy or seriously modify the environmental services provided by these communities, and also reduce the habitat available. As habitats shrink, so do the populations of those species dependent upon them. And, as populations decline, so does genetic diversity and the chances of species survival. In this context, endangered species are just the tip of the iceberg, the most visible part of the overall erosion of biodiversity. The U.S. Fish and Wildlife Service currently lists over 900 native species of plants and animals as threatened or endangered. But this understates the number of species that could ultimately be listed, given further erosions in the natural communities necessary for habitat.

[5] *See e.g.*, Keystone Center, Final Report: The Keystone Dialogue on Incentives for Private Landowners to Protect Endangered Species (The Keystone Center, Keystone, Colorado) (1995). *See also* Keith Wiebe et al., U.S. Dep't of Agriculture, Partial Interests in Land: Policy Tools for Resource Use and Conservation (1996) (presenting a good overview of alternatives).

self-evident.[6] The approach taken by this analysis is informed by economics. While legal analysis is central to our evaluation, the overarching theme is that policy choices should be made given an understanding of the relative costs of conservation that flow from the implementation of those policies. Thus, the essential question addressed by the study can be stated as follows: How can the most effective and valuable conservation be achieved, and how can the costs of achieving it be minimized?

While we devote some attention to a comparison of conservation policies, particular attention is devoted to the use of conservation easements. Easements essentially transfer property rights from a landowner to a private conservation organization or government agency. In effect, the landowner agrees to "extinguish" the right to certain types of future development in exchange for cash or tax benefits.[7] Because they are a restriction voluntarily undertaken--a restriction that is bought and sold--easements bring to the fore issues involving the valuation of preservation. Landowners must consider the value lost from an extinguishment of development rights when they agree to an easement contract. Social decisionmakers must police the appraisal process to insure that easements are being appropriately valued and must develop and employ tools to determine the social value of the development restriction. Also, their interaction with the tax system informs the analysis of tax-driven conservation incentives. Finally, because easements are a form of "partial-interest" in land, they highlight important issues associated with the monitoring and enforcement of land use restrictions.[8]

Easements are also an attractive subject for analysis because their use is relatively widespread.[9] A variety of federal and state programs currently finance easement acquisitions. In addition, these government acquisitions are mirrored by an array of private conservation organizations that purchase, or accept donations of, easements.

This study has a geographic focus as well. We have analyzed easement agreements involving landowners in the state of Florida. Florida is a natural target for study for several

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[6] The "do nothing" approach is clearly unacceptable given the social cost of unfettered development. The weakness of direct regulation, while less obvious, is that it fails to minimize the costs of conservation and imposes often large costs on individual landowners. We provide a more detailed description of these weaknesses in later sections. From a theoretical perspective, and from practical experience borne out by nationwide "property rights" conflicts, direct regulation must be complemented by a wider range of policy options and incentives.

[7] In a legal sense, extinguishment refers to the destruction of a legal right--in this case, the right to develop the property.

[8] A partial interest denotes one in which part, but not all, of an owner's property rights are transferred to another. Since the original landowner remains in possession of the land, the easement owner must monitor, in perpetuity, the landowner's compliance with the easement contract.

[9] Over thirty states have passed legislation specifically sanctioning conservation easements for conservation, scenic, or historic purposes. Daniel Stockford, Note, *Property Tax Assessment of Conservation Easements*, 17 B.C. Envtl. Aff. L. Rev. 823 (1990). The Land Trust Alliance's 1998 National Land Trust Census documents the last decade's explosion in number of conservation acquisitions (both full and partial) nationwide. Between 1988 and 1998 there was a 135 percent increase in the total number of acres under protection (4.7 million in 1998 from 2 million in 1988).

reasons. For geographic, demographic, and economic reasons Florida is a prime example of the clash between development pressure and the need to preserve threatened habitats. The fragility and diversity of species and land types found in the state is accompanied by swift population growth and urban sprawl.[10] Largely because of this, the state has become an important laboratory for new conservation initiatives and studies. For instance, recent State and Federal policy initiatives are focused on the restoration of damaged Everglades ecosystems. Part of this program includes the acquisition and modification of lands to improve water flows and reduce nutrient loadings. Another important initiative has been the state's Preservation 2000 program, financed over 10 years with a $3 billion land preservation fund.[11] The Preservation 2000 plan also specifically requires state land-buying agencies to use alternatives to fee simple acquisition.[12] The Florida Water Management District easements analyzed in this study were motivated in large part by this statutory requirement.

Florida has also proved to be the focus of important studies of the need for habitat conservation. Perhaps the best example is an exhaustive analysis conducted by the Florida Game and Freshwater Fish Commission.[13] The study provides a scientifically-based assessment of the amount and distribution of land use protections necessary to provide minimum conservation goals for the state's rare plant and wildlife communities. Two of the study's conclusions are particularly noteworthy from the standpoint of our analysis. First, approximately 13% of the state's privately owned lands should be kept in their current condition in order to achieve the conservation targets featured in the study. This is a large land area, and implies a correspondingly large social cost if all of that land is to be preserved. Given the scale of the problem, there is a clear need to minimize the costs of acquisition wherever possible--a need best met via the use of flexible, market-based conservation policies. Second, the report emphasizes that economic activity--in particular agriculture--is often compatible with the preservation of habitat. This means that development restrictions, rather than outright conversion and restoration of lands is often an adequate form of protection. From a policy perspective, this is important because it means that outright property acquisitions are not necessary. Partial-interests, such as easements, which simply prevent future conversion to more developed uses, are therefore a legitimate option for the preservation of existing bio-diversity.

The analysis proceeds as follows. Section 2 provides a brief overview of alternative conservation tools including direct regulation, easements, tax incentives, and tradable rights

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[10] In addition to a quickly growing population of 14 million, the state attracts 39 million visitors each year. The development that attends these demographic patterns clashes with the state's unique biological characteristics. The state is home to 668 terrestrial and freshwater vertebrate taxa, 410 endemic vertebrates and approximately 3,5000 species of vascular plants. At least 81 natural plant communities occur, including rare communities of coastal strand, mangrove swamp, and pine rocklands. James Cox et. al., Fla. Game and Freshwater Fish Comm'n, Closing the Gaps in Florida's Wildlife Habitat Conservation System (1994).

[11] Fla. Stat. ch. 259.101(1998). For background on the program see http://p2000.dep.state.fl.us/.

[12] Fla. Stat. ch. 259.101(9)(a)(c) (1998).

[13] Cox et al., *supra* note 10.

programs. The discussion focuses on how these policies might differ in terms of the costs of achieving long-run land preservation. Section 3 focuses on the legal, economic, and institutional issues surrounding the use of easements, using the Florida easement contracts as examples. The easement contracts concretely illustrate many of the costs associated with preservation. They also illustrate ways in which enlightened conservation policies can minimize conservation costs. Section 4 describes the way in which easement values can be estimated by appraisal. The section sheds light on ways in which the costs of development restrictions can be empirically estimated. Section 5 discusses some issues in the selection of properties for conservation. A particularly important point of comparison concerns the degree to which alternative conservation policies target properties for conservation. In general, conservation is more effective the greater is the spatial coordination of protection activities. Such coordination is, of course, to be preferred, although it may also come at some additional cost.

2. THE COSTS OF HABITAT CONSERVATION

Our analysis of conservation policies begins with an analysis of conservation's costs. The discussion is simplified by making an initial distinction. We can divide the costs of implementing any policy between *opportunity* and *transaction* costs. Regardless of the conservation policy used, the opportunity cost of conservation is the value of whatever other economically useful activities are foregone in order to preserve the habitat in its "natural" state. As we will argue, this opportunity cost is invariant to the type of policy used to promote a particular conservation activity. It might be regarded as a baseline cost, and is therefore not particularly useful as a means of distinguishing between different policies. Every policy does differ, however, in terms of the *transaction, informational, and enforcement costs* associated with it. In the interests of brevity, we group all these costs under the first term, transaction costs. Since opportunity costs--for a given conservation outcome--are invariant to the policy, the relative costs of alternative policies are determined by their relative transaction costs.

The Opportunity Cost of Conservation

The cost of conserving habitat is the difference between the value of land in its "highest and best" private use and its value when employed in ways compatible with conservation. The private value of land is determined by the net present value of the flow of earnings to which it gives rise. Thus, put in a different (but equivalent) way, the opportunity cost of conservation is the difference between private land values with and without development restrictions. This baseline cost is the same regardless of whether habitat is conserved by fee-simple purchase, by purchase of easements to restrict land uses, by a system of tradable development rights, by preferential tax treatment in exchange for conservation-compatible uses, or even by imposing land use restrictions with regulation.

As we will argue, conservation policies can differ in terms of the transaction costs associated with ownership, use, and conservation. And they can certainly differ in their effectiveness as conservation tools. But there is no policy that can avoid the social cost associated with the value of foregone development. We make this point at the outset because what may appear to be striking differences in the costs of alternative policies are primarily differences in *who* bears the cost of conservation. For instance, if habitat is preserved by regulating private land uses, the private landowner pays the social cost of conservation. If land is conserved via government purchase of private lands, taxpayers pay. If land is preserved via a system of development rights, developers and future residential and commercial property owners pay. There will always be political disagreement regarding which groups are more morally deserving of bearing or escaping the burden of payment. But the baseline cost cannot be avoided. Any conservation policy that appears to provide for conservation without full compensation for opportunity cost is probably a mechanism where costs are hidden, or one where conservation is likely to be ineffective.

Transaction Costs

The fact that the opportunity cost of foregone development can never be avoided does not mean that all conservation policies are created equal. From an implementation standpoint, and in terms of their likely effectiveness, there are important differences. One way to organize an analysis of these differences is to focus on the institutions and actions necessary to implement the policies in the real world. Any such analysis reveals differences in the information required by agencies, the types and difficulty of enforcement, and costs associated with structuring conservation transactions, whether they be due to writing contracts or establishing markets in development rights.

Below is a more detailed description of policy alternatives. The descriptions highlight both similarities (all policies create the baseline cost due to foregone development opportunities) and differences due to the transactions cost of implementation and the groups that must bear the opportunity cost.

Purchase of full property interests

The purchase of full property interests (sometimes referred to as "fee-simple" acquisition) involves the transfer of land from an owner who might develop the land to a conservator who will not. In order to purchase the property, the conservator must at least be able to pay the property owner the value of the land in private ownership. This value is the net present value of the land in whatever future use may be made of it, which is its opportunity cost.

One of the distinguishing characteristics of full property interest acquisitions is that the conservator must compensate the landowner for the lost value of current financially productive land uses, as well as for the foregone opportunity of future conversion to more profitable use. In fact, this is the major drawback to full-interest acquisitions. They represent

a kind of "conservation overkill" in that they can lead to the extinguishment of agricultural or other activities that are compatible with the conservation goal. The conservator can in theory purchase the property and itself conduct agricultural or commercial activities. In general, however, conservators--because they are conservators, not farmers--will be less able to maximize the financial value of conservation-compatible land uses.[14] The lost value associated with the cessation of conservation-compatible land uses is the primary implementation cost associated with full-interest acquisitions.

Apart from that difficulty, full-interest acquisitions are the most institutionally straightforward of all the conservation mechanisms. All that is required is a standard transfer of real estate ownership. Given a parcel's undivided ownership, the conservator is in a good position to ensure that no incompatible land uses ever take place on the property. In other words, the costs of monitoring and enforcing an agreement are relatively low.

Purchase of a conservation easement

Conservation easements are a contractual agreement between a landowner and a conservator. In exchange for payment (or as a donation with value due to tax deductibility) a landowner agrees to extinguish its rights to future land development. This agreement is monitored and enforced by the conservator, which may be a private conservation organization or governmental entity. Easements are often referred to as "partial interests" in land because they do not transfer the property itself to the conservator, merely the right to enforce prohibitions against future development.

While easement donations may be motivated by altruism, or tax benefits that are difficult to calculate, their opportunity cost remains the same as in all of our examples: the development right is equal to the difference between the land's developed value and its value in current use. When the right to development is extinguished, this value is lost.

Institutionally, easements are relatively straightforward. They involve complex contracting issues (which we describe in detail in Section 3), but are a legal mechanism with a well-established legal pedigree. A chief complication arises from the need to monitor the terms of the easement contract. The conservation-consistent land uses specified in an easement contract can be difficult to enforce. While it may be easy to monitor the construction of new roads or houses, it is considerably more difficult to monitor farming techniques or changes in land cover. With respect to land cover, the situation may also be complicated by the difficulty in distinguishing between natural changes and those induced by management. Moreover, the easement must be perpetually enforceable. As property ownership changes over the decades and the conservation

[14] The conservator might also hire experts to do the farming. But this entails another type of cost. Hiring a farmer to farm your land creates an example of what are called "agency costs." These are the costs associated with monitoring and providing appropriate rewards for the farmer's effort when the farmer's incentives differ from the owner's. And incentives will differ whenever farming and habitat conservation occur on the same property, a point to which we return later.

organization itself changes over the decades, the conservation goal must be served by ongoing, vigilant monitoring and enforcement.

Another challenge presented by the use of easements is due to difficulties with the valuation of partial property right interests. We address the subject in detail in sections 4 and 5.

Tax credits and penalties

Another way to keep land out of development is for the government to give tax credits or other subsidies equal to the difference in value between developed and un-developed uses. For instance, if developed land earns $100 more per acre than it does in low-intensity farming, a tax credit of $100 per acre leaves the property owner indifferent between developing the land and not developing it. The aggregate subsidy is a cost borne by taxpayers.

Alternatively, instead of using tax credits as a reward, the government can use taxes to punish development. For instance, a $100 per acre tax on developed acreage would discourage the landowner from development as effectively as the $100 tax credit. The only difference relates to who bears the cost. Taxes as a penalty against development mean that the landowner bears the cost of foregone development. The development tax reduces the value of the land by $100 per acre--the value of development income foregone.

The use of taxes is usually more complicated than suggested by these stylized examples, however. We have supposed that government can simply impose a tax equal to the difference between conservation-compatible and -incompatible land uses in order to encourage the former. Such lump-sum taxes are rare, however, and rarer yet are lump-sum taxes tailored to the particular use of land.

In practice, taxes are most commonly a function of income generated by the land. This is clearly true for an income tax itself. It is also true for taxes based on the value of property. Because a property's value is a direct function of the income to be earned from it, property taxes are a kind of indirect tax on income. The key difference between property and income taxes lies in the timing of the taxation. Income taxes tax earnings in the year in which earnings accrue, while property taxes, by taxing property value, tax anticipated earnings over all future years. Similarly, estate taxes are essentially property taxes that come due at the time of inheritance.

Having drawn a connection between property taxes and income, it should be noted that property value (the tax base) includes more than value from income alone. Many landowners have a strong personal connection to their land or hold values that might be described as altruism. These values increase the land's value to the property owner and thus increase the price at which a property owner would be willing to sell. Since the market price is a key signal of a property's value for tax purposes, these non-income benefits can indirectly increase the property tax. In contrast, a direct income tax does not even indirectly capture this type of non-income benefit.

To say that taxes are ultimately related to the stream of income to which a property gives rise still does not do justice to the complexities that may be involved in interpreting the conservation implications of federal, state and local land taxes, however. Additional

complications arise. Homeowners can deduct mortgage interest payments, reducing the after-tax costs of home ownership. Corporations pay taxes at different rates than do private individuals, and properties used for business purposes are, in general, subject to different rules than are residential properties.[15] Also, estate tax provisions result in idiosyncratic tax treatment for inheritors. For instance, federal tax law allows the first $650,000 of an estate to be passed along tax-free.[16] Thus, smaller estates escape property taxes, while larger parcels that might be more desirable for nature reserves must sometimes be sold, subdivided, and developed in order to meet inheritance tax obligations.

A particularly important aspect of the tax system is that it always "under-rewards" conservation donors. Because tax codes require payment of something less than the entire amount of income or value of property, relief from this tax payment incompletely compensates the donor relative to the true value of the donation. In effect, there is a cap on compensation when tax relief is used to motivate donations. Thus, the cancellation of tax obligations will never, in and of itself, provide an adequate social inducement to conservation.

Why then do we observe conservation donations? First, many landowners are motivated by altruism or a personal sense of connection with the land. As noted earlier, these idiosyncratic benefits to donation can be an important motivation above and beyond financial compensation. Second, it is possible that in some cases under-compensation is somewhat offset by over-valuation in the appraisal process.[17] For this reason, the donation of conservation interests may generate scrutiny from tax authorities.[18]

Finally, like easements, tax-based conservation incentives require monitoring in order to confirm that the taxpayer is maintaining the land as they claim to be maintaining it. It is also important to note that tax-based incentives are generally unable to target specific properties for conservation. Since effective conservation may depend not only on the total area preserved, but also on the configuration of conserved lands (a large contiguous area may be preferable to several small unconnected ones if, for example, the objective is to provide habitat for a large predator),[19] the conservation efficacy of tax incentives is difficult to predict. Moreover, unlike specific rights purchases, or even a system of tradable rights, the aggregate level of conserved area will be unknown until after the fact, again because the aggregate response of landowners to tax incentives is difficult to predict. A potential

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[15] Many jurisdictions also distinguish between the nature of businesses, charging different rates on farms and production forests than on, for example, factory or retail properties. Moreover, waivers or reductions in property taxes are used in some areas to attract new businesses.

[16] 26 I.R.C. 2010(b). The applicable exclusion from estate tax increases to $1,000,000 in 2006.

[17] Appraisal and other valuation issues are treated in detail in Section 4.

[18] Appraisal is an inexact science and, inevitably, assessments will be too high in some instances and too low in others. One need not be a complete cynic to suppose that properties that are appraised at too high a value are more likely to be devoted to conservation than those for which assessments are lower.

[19] Todd Olson, "Biodiversity and Private Property: Conflict or Opportunity?," in William Snape & Oliver Houck eds., *Biodiversity and the Law* (Island Press 1996) (discussing one methodology that can be used to calculate the "contiguity-adjusted" value of habitat).

advantage of tax-based incentives is that the administrative resources and systems needed are largely already in place. The Internal Revenue Service, state revenue agencies, and the price-support systems employed by the U.S. Department of Agriculture, are at the very least useful models for the construction of a tax-driven approach to land use regulation.

Tradable development rights

Tradable development rights (TDRs) require a restriction on the amount of land that can be developed in a given area. Suppose, for instance, that the government seeks to restrict development by 50 percent in an area. It can do so by awarding each landowner the right to develop only 50 percent of their acreage. These development rights can then be traded. TDRs impose costs on the landowners who have their development rights restricted. The aggregate opportunity cost is, as always, the value of development that is foregone in order to achieve the conservation goal. Though rights will be traded, the initial restriction of development opportunities imposes a cost on landowners.

A tradable rights system has one particular advantage. Because property owners can, in effect, choose amongst themselves where development will ultimately be restricted, it leads to the least-cost development restrictions. In other words, development will be restricted on those properties where the expected value of development is least.

Institutionally, TDRs are relatively complex since they require the establishment of a new market (a market in rights to development). Any new market will require learning and will impose the same monitoring and enforcement requirements mentioned in the discussion of easements and tax incentives. Also, TDRs can be problematic if the ecosystem value of the land is highest on the properties where the value of development is least. In such a case, the market will lead to development on the most ecologically valuable property. This problem can be corrected by introducing an additional level of complexity to the market--"trading differentials" that reflect property-specific ecological characteristics of the lands. But this clearly implies an additional and formidable set of administrative challenges.

Finally, if markets are thin--meaning that there is a relatively small number of potential development buyers and sellers--then it can be difficult for buyers and sellers to find each other and strike a deal. The costs of infrequent and idiosyncratic purchases add to the overall cost of implementation.

Regulation

Regulation that prohibits development may appear to be costless at first glance; after all, when land use restrictions are imposed by regulation, there is no property transaction and no payments or subsidies to landowners. Nevertheless, regulation imposes the same baseline cost as the other options--the value of development foregone. In effect, regulation deprives the landowner of the opportunity to earn income from future development. It is for this reason that many consider such regulations to be "takings" of property.

Regulation has the virtue, relative to TDRs and tax incentives, of being able to target specific habitat types and even specific properties. In fact, regulation may seem to be a particularly efficient way of approaching conservation, since it eliminates the need for intervening institutions such as markets or tax assessment and collection. Like all of the other options, however, regulation requires the expenditure of monitoring and enforcement costs to ensure its effectiveness.

The greatest drawback to land-use regulation is associated with the way in which it selects properties to be regulated. In a world with perfect information, the answer is simple: select properties where land restrictions offer the highest net benefit. Unfortunately, this requires the government to have an understanding of *private* land use values, since private land values determine the cost of development restrictions. But the government is unlikely to have accurate knowledge of private land values. Tax incentives, tradable rights, and rights purchases all rely on voluntary decisions made by property owners in order to promote conservation on properties where the value of alternative uses is lowest. In contrast, the involuntary and information-constrained nature of regulation means that the lowest-cost properties will not necessarily be selected.[20]

Another problem with regulation is a political, or even ethical, one. Forcing specific landowners to disproportionately bear the costs of conservation--even if this method achieves conservation at the minimum social cost--smacks of unfairness.

The conclusion of this brief review of conservation policies is that preferences for one policy over another should be rooted in a detailed analysis of the policies' implementation. As an example, we now turn to a detailed analysis of one particular policy, the use of conservation easements.

3. A LEGAL AND ECONOMIC ANALYSIS OF CONSERVATION EASEMENTS

The preceding section suggests numerous considerations that affect alternative conservation policies' costs and effectiveness. The complexity and uncertain magnitude of these factors should lead to agnosticism regarding the ability to confidently rank polices in terms of cost-effectiveness. Active experimentation with implementation will help to determine which instruments work best in practice.

A natural place to begin experiment and analysis is with the use of easements in lieu of fee-simple acquisition. As indicated earlier, numerous conservation organizations and public agencies are currently engaged in easement acquisitions nationwide. Easements

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[20] Suppose, for example, one property owner's land is worth $150 per acre to developers and $50 in agriculture, while another's is worth $100 to developers and $60 in agriculture. If both parcels will sustain an endangered species equally, it is socially desirable to achieve preservation via conservation on the latter's land. A market for properties, easements, or development rights will tend to naturally select that optimal land for preservation. This is true because the latter's land is worth less to developers, because it is worth more as agricultural land, and because it is in the self-interest of the parties to act on their private beliefs regarding the relevant land values. A regulator will make the correct choice only if it has full knowledge of the land values--a state of affairs which is unlikely.

possess several advantages. First, partial interests are less costly to acquire than the full property. This means that, given a limited amount of public funding available for conservation, easements allow a greater total land area to be shielded from development. Second, relative to conservation tax incentives or tradable development rights, easements require little in the way of new administrative burdens. Third, they also require few, if any, changes in environmental and property statutes. Finally, easements are more politically palatable than direct land use regulation. This virtue follows from the voluntary nature of easement acquisitions. And easements spread the costs of conservation either to society as a whole, if purchased with tax dollars or induced by tax relief, or to those who voluntarily undertake the expense, as when they are purchased by private conservators.

Easements present a host of challenges, however. Savings in acquisition costs must be balanced against higher long-run costs associated with the division of ownership rights between the grantor and conservator. Because they are a form of "shared" ownership, the long-run effectiveness of the tool must be scrutinized. For instance, conflicts between the landowner and conservator create the possibility of legal conflict in the future--and a set of contingencies that must be addressed at the outset via the easement contract. Finally, drafting the contract is itself costly.[21]

With this in mind, we now turn to a more detailed analysis of easement contracts and report on the use of easements in the state of Florida. The contracts analyzed include 13 between landowners and Florida Water Management Districts (WMDs) and 5 between landowners and the Nature Conservancy (TNC), a private conservation organization.[22] These contracts represent the universe of agreements completed by the state and TNC in Florida as of 1998. While two of the TNC contracts were completed more than ten years ago, the rest are of more recent vintage and signify the recent emergence of easements as a conservation tool in Florida. The properties concerned are geographically dispersed throughout the state and are relatively large in size, in some cases over ten thousand acres.

Most obviously, the easement contract defines the rights that are transferred to the conservator and thereby defines the habitat characteristics to be preserved. In addition, however, easement contracts establish the means of enforcement for that division and transfer of rights. The enforcement of the contract is the primary source of long-run easement costs. It should be emphasized that easements are not a statutory or regulatory approach to conservation. With easements the government does not compel conservation directly. Instead, easements rely on the ability of the conservator to ensure that the terms of the contract are appropriately defined and satisfied. A contract's terms are determinative of both the quality of conservation that will occur and the costs of ensuring long-run compliance. For

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[21] According to one estimate, costs associated with surveying, appraisal, title searches, title insurance, and other actions necessary to record an easement averaged $83 per acre on properties where the easement's cost itself was on average $2000 an acre. Lancaster Country Agricultural Preserve Board, *200 Farms and over 17,000 Acres Now Preserved*, Agriculture Preserve Board News, Summer 1994.

[22] The WMD easements were purchased from landowners. The TNC easements were donated, with compensation coming in the form of tax deductibility.

this reason, a detailed analysis of contract terms is necessary for a normative evaluation of easements as a conservation tool.

To proceed, we will first define the broad outlines of a representative contract. Then we will discuss the function of particular contract terms in detail. This is done in order to explain the conservation incentives created by the contracts and in order to highlight potential costs associated with their long-run enforcement.

While there is a fair degree of variability in the individual contracts, most share a basic set of characteristics. These include:

Descriptive elements: A description of the property, its ecological conditions, and known environmental hazards. In addition, there is often a broad "statement of purpose," delineating the conservation goals sought.

Auditing requirements: The seller usually agrees to at least a Phase 1 Environmental Assessment[23], agrees to identify and correct any encroachments onto the property, and must identify and remove dis-amenities, such as trash.[24]

Limitations on use: The grantor's ability to commercially or residentially develop the land or alter existing land uses is limited.

Rights reserved by grantor: A description of land uses that the grantor can pursue in the future, such as the ability to sub-divide the property for sale.

Land management requirements: The grantor agrees to meet certain standards (often defined by so-called best management practices) in its management of the property and agricultural, forestry, or other activities.

Right of access: The conservator is granted the right to enter the property in order to observe ecological conditions and to confirm that the grantor is abiding by the contract's conservation and management provisions.

Demonstration of unencumbered ownership: The grantor must demonstrate that the property has no liens attached to it (claims for payment of a debt associated with a mortgage, tax liability, etc.).

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[23] This assessment will determine whether there is a high probability, or the actual presence, of hazardous waste or other contaminants. The Southwest Florida WMD conducts its assessments in accordance with ASTM Standard Practice for Environmental Site Assessments (E-1527-94 and 1528-93).

[24] An encroachment is an illegal intrusion onto the property--such as a building, fenceline, or road that is constructed or used without a legal right to do so.

Remedies for breach of contract: In the event a party breaches the contract's terms, the other party is entitled to seek monetary damages or remedial actions from the breaching party in a court of law. A preference for arbitration, responsibility for legal fees, and specification of jurisdiction for resolution are often included.

Limitations on the liability of the conservator: The conservator is indemnified against (relieved of responsibility for) existing and future liabilities associated with the property, including third-party claims and tax liabilities.

Statement of the easement's transferability: The easement binds all subsequent owners of the property in perpetuity, and the conservator must be notified and given right of first refusal in the event the property is sold.

Sale-related provisions: These provisions relate to responsibilities, deadlines, and payments associated with the original easement sale itself. Examples include responsibility for commissions and fees associated with the sale and audits, the timing of surveys, and form of payment.

It deserves emphasis that not all contracts include each of these components. This is due in part to an increasing sophistication regarding the use of easements. For instance, older contracts tended to not require the demonstration of unencumbered ownership. In recent years, however, encumbrances have been recognized as a threat to the enforceability of easements. Virtually all recent easements include provisions guarding against this threat. Variability in contracts is also due in large part to the fact that they are negotiated. Because they are a private transfer of rights, easement contracts are flexible and can respond to the individual needs of property owners. Clearly, there are limits to the flexibility that can be offered if conservation goals and contract enforceability are to be insured. To better understand which provisions are most important from a conservation standpoint, we now explore the function of specific contract provisions in greater detail.

Easement contracts open a window onto the challenges presented by conservation policies. Because they are a private approach, easement contracts must create a form of regulation all their own. An easement establishes the conservation goal, defines the division and transfer of rights, provides safeguards against opportunistic behavior, and establishes means by which the agreement will be monitored and enforced. This is all contained in a single package, the easement contract itself.

In general, contracts allow two or more parties to bind themselves, before the fact, to a set of actions that is expected to make them collectively better off. Contracts are thus a kind of trade. They define responsibilities and the price that is paid for the fulfillment of those responsibilities. In the case of an easement, the principal responsibility is imposed on the land owner, in the form of land use restrictions. This responsibility is accepted in exchange for

direct payment or tax-related benefits. If that was all there was to it, easements would be no harder to buy than a newspaper. Conservation is more complex, however, and that complexity is reflected in the contracts.

Delineation of Rights To Be Transferred

Easements typically begin by making a statement of the contract's purpose as a conservation instrument. This statement is a clarification of the conservator's purpose and notifies courts and future land owners of the general intent of the agreement. The core of an easement is a more detailed enumeration of land uses that are prohibited by the agreement, such as residential or commercial development, timber harvesting, or wetland conversion.[25] The list of prohibitions can be extensive. It is common to base the definition of acceptable land uses on an understanding of current land uses -- that is if current land uses are consistent with habitat preservation. Of course, this requires a detailed understanding of current uses. For this reason, contracts typically require an initial ecological and land use inventory.[26]

In addition to detailing prohibited uses, the contract may delineate allowable uses and changes to the property. For instance, an owner may reserve the right to limited homestead development, or the construction and maintenance of service roads. Allowances for development tend to be specifically delineated. When they are not, some of the contracts state that any ambiguity in the definition of an allowed use is to be resolved by a reasonableness standard as determined by the conservator or, occasionally, the landowner.[27] Other contracts explicitly state that the defined contractual language may be modified only by written mutual agreement of both the conservator and the landowner.

The Term of the Contract

One characteristic of conservation easements is particularly noteworthy: the fact that they tend to be perpetual, rather than short-term (e.g., yearly). Why is this? After all, it is not even clear that formal contracts are needed at all. Instead, conservators and landowners could bargain each time a change in land use is contemplated and commit themselves to agreements

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[25] The precise legal mechanism for these prohibitions is the extinguishment of development rights on the property. While we may speak of a transfer of rights to the conservator, it is not the development right that is transferred. Rather, the conservator is granted the right to enforce the extinguishment of the development right.

Florida law places express limits on the terms of conservation easements which do not specifically pertain to the retention of land or water areas in their natural condition. Fla. Stat. ch. 704.06 (1998).

[26] These kinds of documents may consist of what are called "property condition certificates" or "natural resource inventories." In several of the Florida WMD cases, the Nature Conservancy was contracted to construct the initial natural resource inventory.

[27] Many contingencies cannot be foreseen. A pertinent example is the installation of microwave transmission towers. An easement contract written 20 years ago would not have included a specific prohibition against such structures since they did not exist at that time. However, a reasonableness standard, in conjunction with an explicit understanding of the easement's purpose, can be called upon to resolve such unforeseen conflicts. For instance, if the easement seeks the preservation of aesthetic value, microwave towers would most likely fail a reasonableness test.

that are short in duration, such as the length of a growing season. One reason easements do not take a short-term form is that bargaining is costly. Because the desire to change land uses can arise frequently, a short-term contracting approach implies frequent bargaining. Long-term, and perpetual, contracting minimizes these bargaining costs.[28] Balanced against this desire to avoid the costs of repetitive bargaining may be a desire to retain flexibility, however. As we discuss below, many contracts do contain terms regarding their own termination. By and large, however, it appears that contracts are intended to be permanent agreements.

In addition to the desire to avoid repetitive bargaining, risk aversion can also lead to a preference for long-term contracts. The longer the contract term, the longer is the horizon over which specific commitments are made by the landowner. This means, of course, that long-term contracts are more expensive for the conservator. But this is a price they may willingly pay, given the desire to "lock in" preservation long into the future. From a landowner's perspective, an easement sale or donation promises a certain, immediate payoff. For risk averse landowners this may be preferable to the gamble that their land will some day be profitably developed, an event that is usually uncertain.

Allocation of Liability

It is gratifying to find that the Florida easement contracts exhibit the properties expected of an "optimal" contract.[29] An important example of this relates to the allocation of responsibilities and risk-bearing between the parties. From an efficiency perspective, the design of an optimal contract should consider which party can best prevent or insure against risks due to a costly future contingency.[30] There are two basic sets of contingencies that must be accounted for in an easement contract. The first is degradation in the property's ecological condition. Primary responsibility for property degradation lies with the landowner for the simple reason that they are in most direct control over the property's condition. In fact, the landowner, via its daily and direct control over land use, is the most likely *cause* of land degradation. It follows that the landowner is also the party that can avoid degradation at the least cost, both because they may be the cause of degradation and because their ability to monitor degradation is superior to the conservator's.

There is typically an exception to the landowner's liability for degradation, however. When degradation is due to causes outside the landowner's control, such as an "act of God,"

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[28] Similar considerations may also explain the relatively large size of properties on which easements have been purchased or donated. Inasmuch as the costs of writing a contract are largely fixed with respect to property size, negotiating easement deals is probably a more attractive proposition for large as opposed to small properties.

[29] This is to be expected. Because contracts are a form of voluntary "exchange" they are expected to yield terms that, from an ex ante perspective, maximize the joint welfare of the parties.

[30] For more on the theory of optimal contracting, see Richard Posner, *Economic Analysis of Law* (1992); Charles Goetz and Robert Scott, *The Mitigation Principle Toward a General Theory of Contractual Obligation*, 69 Va. L. Rev. 967 (1983).

the landowner is not liable for damages or costs of restitution.[31] This is an optimal allocation of risk because the landowner cannot prevent such acts and because the owner is not likely to be the efficient bearer of risk. In general, the conservator will be a more diversified and deeper-pocketed property owner and thus be less risk averse than the landowner.

It is interesting to note, however, that the landowner may not be completely absolved of all concerns with respect to events beyond her control. As we will discuss below, contracts also typically contain provisions for the establishment of an ecological baseline and monitoring to determine status relative to that baseline. Animal populations may, of course, fluctuate in response to both random and deterministic factors. Inasmuch as the conservator may find it difficult to determine if all contract terms with respect to management practices and the like have been honored, it may wish to leave the landowner with some responsibility for regrettable outcomes, even if these are not fully within the landowner's control.[32]

The second general set of contingencies that must be addressed by an easement relates to responsibility for pre-existing or contingent liabilities attached to the property. The most prominent examples include liability for delinquent tax payments and liability for environmental contamination. Tax obligations and environmental contamination are under the direct control of the landowner. They are also inherently more observable to the landowner than to the conservator. For these reasons, it is optimal for the landowner to be responsible for liability-related costs. Easements accomplish this by indemnifying the conservator against such liabilities. In addition, the property owner is typically required to conduct a Phase I environmental audit prior to transfer of the easement and make a representation that the property is free of contamination sources such as leaking storage tanks.[33]

The Baseline Audit

Baseline property inventories are important because they identify existing habitat and thereby allow for the identification of degradations to the habitat. As noted earlier, it is essential to establish a solid ecological baseline if degradation is to be prevented by easements. Penalties can be triggered and enforced only if the contract can be reasonably

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[31] Typical language takes the following form: "nothing herein shall be construed to entitle Grantee to institute enforcement proceedings against Grantor for any changes to the Property due to causes beyond Grantor's control, such as changes caused by fire, flood, storm, earthquake, major tree disease, acts of God, or the unauthorized wrongful acts of third persons."

[32] This may be another reason why easement agreements tend to be signed by relatively large landowners. The fact that larger habitats are less vulnerable to localized fluctuations in habitat quality makes them both more valuable as habitats per se, and more amenable (on a per-unit-area basis, at least) to accurate monitoring.

[33] These safeguards are necessary because an indemnity agreement holding the conservator harmless will not necessarily be honored by courts. If the primary landowner and polluter are unable to pay for cleanup a joint owner (e.g., the conservator) may be held responsible. For example, provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) could potentially hold a conservator responsible for environmental contamination. *See* 42 U.S.C. § 9607 (1998).

specific about existing habitat and land uses, and future uses that are inconsistent with the conservation goal.

While the baseline audit serves to enforce the conservation goal in this way, the baseline also provides a benefit to the landowner. More specifically, it protects the landowner from unwarranted claims of degradation. Because the landowner is liable for degradation, the conservator may have an incentive to claim degradation even when it has not occurred. Because the contract in effect insures the conservator against any habitat loss, the conservator has an incentive to detect and force restitution of anything that can be claimed as degradation.[34] This possibility is clearly undesirable from the landowner's point of view. The baseline protects the landowner by disciplining the conservator's pursuit of compensation in cases where degradation may not in fact have occurred.

Terms Left Unspecified

Contracts are never able to define every possible future contingency. The costs of identifying and allocating responsibility across a "complete" set of circumstances are prohibitive. For this reason, contracts often rely on underlying principles of law, precedent, or community custom to define what is acceptable. In the absence of explicit contract terms, it is left to the courts to decide whether or not a contract breach has occurred and specify damages if one has. For instance, given an unspecified contingency a court may assign liability in a way consistent with similar previous cases.[35] Alternatively, courts may make the determination based on the decision's impact on the value of similar, future contracts. A normative, economic approach to contract principles would establish liability by determining the rule that would have maximized the contract's expected joint benefits at the time it was created. Irrespective of the court's precise method for resolving the dispute, contracts are almost always left incomplete in order to avoid the need for exhaustive examination of all possible future events.

Reliance on more generic standards, rather than contract-specific language, arises in some of the easements during the definition of appropriate land management practices. While some contracts require a site-specific plan, others call for the use of standard Best Management Practices (BMPs) or rely on a "duty of care" test. BMPs include those practices currently approved by any of six organizations, including the U.S. Department of Agriculture

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[34] The landowner's responsibility for degradation costs creates a kind of "moral hazard" on the part of the conservator in that the arrangement leads the conservator to view land improvements as costless.

[35] Custom serves a function similar to precedent. Common in accidental injury or property damage cases, court determinations of customary practice are often used to define standards that are not explicitly defined contractually. *See* Richard Epstein, *The Path to the T.J. Hooper: The Theory and History of Custom in the Law of Tort*, 21 J. Legal Studies 3 (1992); Stewart Macauley, *Non-contractual Relations in Business: A Preliminary Study*, 28 Am. Sociological Rev. 55 (1963). Macauley's is an early statement of this contract view of custom: "Those who write and read specifications are experienced professionals who will know the customs of their industry and those of the industries with which they deal. Consequently, these customs can fill gaps in the express agreements of the parties." (at 136).

Natural Resources Conservation Service and the Florida Department of Agriculture and Consumer Services (FDAC). FDAC has issued specific conservation practices for the purpose of protecting Florida's water resources (including streams, lakes and wetlands) from pollution associated with forestry operations.[36] These BMPs were originally designed in the mid-1970s in response to the Clean Water Act, but were revised in 1993 with the assistance of representatives from the state and federal government, universities, forest industry and environmental groups. The recommended practices are extremely specific, and depend on the size and type of waterbody involved, the local soil type, and the general potential of the site for erosion and sedimentation. A BMP Technical Advisory Committee meets biennially to evaluate the status and progress of BMP implementation and effectiveness.[37] Recent cases illustrate a judicial awareness of the importance of BMPs and suggest that BMPs can and will be examined to determine compliance with statutory land management requirements.[38]

Some contracts refer to a more general affirmative "duty of care" between the landowner and the conservator. For example, one conservation easement contract signed by the St. John's River Water Management District states that the "Grantor hereby acknowledges a continuing duty of care to Grantee imposed by this Easement upon Grantor to carry out the intent and purpose of this Easement in regard to Grantor's ownership and occupancy of the Property." Unlike BMPs, the parameters of a duty of care for conservation have not been well-defined by either case law or government organizations. One example of a duty of care pertaining to land management can be found in the 1976 Federal Land Policy Management Act (FLPMA), which gives the Secretary of the Interior broad authority to manage the federal government's vast land holdings.[39] Under the FLPMA, the Secretary has two distinct duties of conservation for Wilderness Study Areas (WSAs), roadless areas of 5,000 acres or more which meet the criteria of the 1964 Wilderness Act. The Secretary has a nonimpairment duty to manage the WSAs "in a manner so as not to impair the suitability of such areas for preservation as wilderness . . ." and a nondegradation duty to "take any action required to

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[36] FDAC, Silviculture Best Management Practices (1993).

[37] The Bureau of Water Analysis of the Florida Department of Environmental Regulation issued BMPs for Agriculture in 1978 pursuant to statutory requirements of the Clean Water Act. *See* Nonpoint Source Management Section, Florida Department of Environmental Regulation, A Manual of Reference Management Practices for Agricultural Activities (1978). Unlike the specific conservation practices for forestry operations, these BMPs are general practices or categories of practices required to achieve the abatement of nonpoint source pollution. The manual refers to the U.S. Department of Agriculture for specific BMPs that are applicable in Florida.

[38] *See* Sierra Club v. Martin, 992 F.Supp. 1448 (N.D. Ga. 1998) (holding that the Forest Service had not failed to follow required BMPs as required by federal statutes); Blue Mountains Biodiversity Project v. Blackwood __F.3d__, 1998 WL 828124 (9th Cir. 1998) (holding that an environmental assessment was insufficient because the BMPs to be used were inappropriate for severely burned forest areas where increased levels of erosion has already occurred.); Idaho Sporting Congress v. Jemmet, 1997 WL 855506 (D. Idaho 1997) (determining that road construction in a Nez Perce National Forest timber sale had complied with all identified BMPs).

[39] 43 U.S.C.A. § 1711 (1976).

prevent unnecessary or undue degradation of the [WSAs] and their resources. . ."[40] While these duties are not binding on the landowner in a conservation easement contract, they do give a general outline of the expectations in an affirmative duty of care standard.

Reliance on BMPs and a general duty of care is not surprising. Properties differ widely in terms of their habitat characteristics and existing land uses and site-specific management plans are costly. Use of more generic standards of appropriate management practice is one way to economize on the costs of achieving an agreement. The point is that incomplete (vaguely specified) contract terms do not necessarily absolve a party of responsibility. They simply shift determination of what that actual responsibility is away from the contract itself.

When properties present unique land use and habitat interactions a more detailed set of management expectations may be necessary in order to achieve the desired conservation goal. Several of the Florida contracts specify the need for a detailed and regularly updated management plan, often prepared with the assistance (and imprimatur) of a third party.[41]

The Contract's Enforceability

Easement contracts, if they are to be effective, must be concerned with their own enforceability. First, compliance with the contract's terms must be verifiable. Second, the easement must be transferable and honored by all subsequent landowners. Third, the property must be free of legal "encumbrances" that could threaten the conservator's claim to ownership. The Florida easements include a variety of contractual safeguards directed at these concerns. Finally, it is important to consider the legal duty of the conservator to act as contract enforcer.

Monitoring

All of the contracts include a guarantee that the conservator or its agents can enter the property in order to monitor the landowner's compliance with the easement. Usually, the right of entry is limited--e.g., it can occur only at "reasonable intervals" and upon "reasonable notice" of an inspection. In addition, several of the easements require the landowner to produce an annual report that documents their compliance with the easement.

Transferability in perpetuity

As noted earlier, easements typically grant the conservator development rights in perpetuity. By construction, the covenant is designed to transfer to each subsequent landowner. While the legal basis for transferability is sound, there are several practical considerations that can be problematic. Decades from now, or after the property has changed

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[40] 43 U.S.C.A. § 1782(c). *See* Sierra Club v. Hodel, 848 F.2d 1068 (10th Cir. 1988) (explaining the breadth of the conservation duties of the Secretary of the Interior for WSAs), overruled on other grounds, Village of Los Ranchos de Albuquerque v. Marsh, 956 F.2d 970 (10th Cir. 1992).

[41] Several of the contracts specify that the land management plan is to be drafted in consultation with bodies such as the Natural Resources Conservation Service or the Institute of Food and Agricultural Sciences at the University of Florida.

hands several times, documentation of the easement may become more obscure. Given the perpetual nature of the easement, there is the danger that some future owner will commence development or pursue some other prohibited land use. This action may be based on ignorance or on the claim that the property was purchased without knowledge of a development restriction. After all, it may be in the interest of future owners to misrepresent the existence of an easement at the time of sale in order to increase the sale price. Even if the legal basis of the easement remains sound, misunderstandings of this sort can create significant legal costs and require continual monitoring on the part of the conservator.

Some contracts attempt to minimize these difficulties by including a requirement that the terms of the easement must be incorporated in any deed by which the landowner transfers an interest in any portion of the property. This safeguards the easement provisions by stating that even if the landowner fails to incorporate the easement restrictions in future property transfers, the easement and its enforceability provisions will still be valid. This gives owners a legal incentive to not disguise the existence of the easement, since they would be unambiguously liable for damages in the event that a subsequent owner claims ignorance of the easement.

Other contracts state that, not only will the easement bind all successive landowners, but also that the conservator must approve the property transfer. Also, most of the contracts give the conservator a "right of first refusal" at the time of sale. This has the practical effect of requiring the conservation organization to be notified whenever the property is on the market. Notification makes the monitoring of transactions easier for the conservator and facilitates their acquaintance with new owners.

Encumbrances

Consider a landowner whose property is heavily mortgaged or who is delinquent in their payment of property taxes. If the owner sells an easement to a conservator the easement contract may be legally invalid and the conservator, because of the weak financial position of the owner, may fail to recover the purchase price.[42] The insolvency of the landowner, combined with competing claims on the property can invalidate a contract.[43] Mortgages and

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[42] Cheryl A. Denton, *Conservation Easements in Florida: Do Unsubordinated Mortgages Pose A Threat?*, 70-APR Fla. B.J. 50 (1996). The principle of "first in time, first in right" has traditionally been applied to extinguish easements due to foreclosure on a superior (preceding) mortgage. *See* U.S. v. Roberts, 788 F. Supp. 555 (S.D. Fla. 1991); Kling v. Ghilarducci, 121 N.E.2d 752 (Ill. 1954). *See generally* Bush v. Duff, 754 P.2d 159 (Wyo. 1988) (extinguishing easement by necessity due to foreclosure of mortgage on servient estate), *overruled on other grounds*, Ferguson Ranch, Inc. v. Murray, 811 P.2d 287 (Wyo. 1991).

Easements can coexist legally with a mortgage, but this requires a "subordination agreement" from the mortgage lender. This is a statement that the lender will give priority to the easement interest in the property over its own interest in the easement's value as collateral. In practical terms, it is an agreement not to seek extinguishment of the easement in the event that the landowner defaults on its mortgage.

[43] This is not always the case. Even if a foreclosing mortgagee wishes to extinguish an easement a court may not allow termination on equitable grounds, reasoning that the public interest requires judicial intervention. *Cf.* U.S. v. Norris, 937 F.2d 286 (6th Cir. 1991) (ordering a bank which acquired property ownership under mortgage foreclosure to allow restoration of the land to its former wetlands state).

tax liabilities are pre-existing debts. These debts mean that the mortgage grantor or government has an "interest" in the property (e.g., as collateral) that takes priority over the easement holder's interest. An easement, by reducing the value of the land held by the landowner, reduces the value of collateral available to parties with a pre-existing interest in the land.

In order to guard against this, the Florida easement contracts require the easement to be delivered "free and clear of all liens, mortgages, and other encumbrances." In some cases, the buyer purchases title insurance for the seller. Title insurance involves an examination of ownership records and a third-party warranty against conflicting ownership claims. These contract terms enhance enforceability by eliminating the possibility that there will be claims other than the conservator's to the land's value.

Federal tax law also contains protections against the threat of competing claims on the property. The tax code disallows easement-related charitable donations when there is a mortgage on the property unless there is a subordination agreement from the mortgage lender.[44]

The conservator's duty

Given the administrative and direct financial costs of monitoring contract provisions, the conservator's obligations are worthy of scrutiny. First, the definition of a valid conservation organization (and thus of a valid easement holder) is provided in Florida's enabling statute.[45] The goal of the definition is to have responsibility for contract compliance reside only with organizations that have a demonstrably strong environmental interest. To allow organizations with less credible credentials purchase easements might invite sham transactions in which tax savings are generated without any corresponding public benefit. It is worth noting, however, that the legal standards governing a private conservation organization's enforcement of a private contract are somewhat vague. This is potentially important given the social value of the private contract. While there is no reason to question the motives of private conservation organizations, given the contracts' perpetual nature and the possibility that the easement holder's objectives may change over time, legal clarification of private easement holders' enforcement duties is desirable.

In general, the directors of conservation organizations are held to a standard of care similar to that of a director in a private corporation.[46] Namely, that they shall perform their

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[44] Treas. Reg. § 1.170A-14(g)(2-6).

There is one example of a subordination agreement in the Florida contracts, where a mortgage lender "has evidenced her consent to the terms and intent of this deed ... and has agreed that the lien represented by the mortgage shall be subject and subordinate to the interest conveyed by this deed ..."

[45] Fla. Stat. ch. 704.06(2) (1998).

[46] Drafters of the Revised Model Nonprofit Corporation Act ("RMNCA") established the corporate standard as the proper standard by which to judge directors of non-profit corporations. RMNCA § 8.30 (1988). Though Oregon is the only state that has adopted the Act in its entirety, it has also been adopted by the Subcommittee on the Model Nonprofit Corporation Law of the Business Section of the American Bar Association. *See generally* Mary Frances Budig et al., *Pledges to Non-Profit Organizations: Are They Enforceable and Must They be Enforced?*, 27 U.S.F.L. Rev. 47 (1992)

duties in good faith, with the care an ordinarily prudent person in a like position would exercise under similar circumstances, and in a manner the director reasonably believes to be in the best interests of the corporation. Using the Nature Conservancy as an example[47], the United States Attorney for the District of Columbia is vested with the power and discretion to bring suit against a TNC director in the unlikely event that the TNC failed to perform its obligations as conservator.[48] But, importantly, the U. S. Attorney cannot be compelled to bring an action for enforcement.[49] Because the U.S. District Attorney's vast authority is in practice rarely used, abuses of charitable assets are likely to be corrected by the court only if they are egregious. If for some reason TNC failed to meets its obligations as conservator, an NGO could bring this to the U.S. Attorney's attention, but would be unable to independently force a suit.[50]

Like private corporations, conservators can cease to exist as a legal entity. Given the perpetual nature of easements, what would happen if the conservation organization was dissolved?[51] Again using TNC as an example, the TNC's assets include its easement contracts. Assets subject to limitations permitting their use only for charitable or similar purposes can only be transferred to another corporation engaged in activities substantially similar to those of the dissolving corporation. The conservation easement contracts would therefore need be transferred to a conservation organization in the unlikely event that the TNC was dissolved. If TNC merged or consolidated with another nonprofit corporation, the surviving corporate entity would be responsible for all of TNC's prior liabilities and obligations, which would include obligations stemming from the conservation easement contracts.[52]

The duty of a state conservation agency is much clearer. Florida explicitly binds the WMDs to their duties as conservators. Under the Florida Preservation 2000 Act, public agencies assigned responsibility for easement interests are required to comply with the terms of the easement contract and "shall inspect and monitor any less-than-fee simple interest according to the terms of the purchase agreement relating to such interest."[53] If a WMD failed to sufficiently monitor the landowner's compliance with the easement a third party with

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[47] TNC is a nonprofit corporation organized and existing under the laws of the District of Columbia.

[48] D.C. Code Ann. § 29-419 (1997-1998). Under this statute, the U.S. Attorney would seek involuntary dissolution of the corporation.

[49] U.S. v. Bar Ass'n of District of Columbia, 197 F.2d 408 (1952) ("Congress expressly provided that any proceedings thereunder must be initiated by the United States District Attorney and no provision was made by means of which a citizen might bring such action upon failure or refusal of the District Attorney to do so.")

[50] *See generally* James J. Fishman, *The Development of Nonprofit Corporation Law and an Agenda for Reform*, 34 Emory L.J. 617 (1985).

[51] D.C. Code Ann. § 29-549 addresses the distribution of assets of a corporation in the process of dissolution.

[52] D.C. Code Ann. § 29-545(5) (1997-1998).

[53] Fla. Stat. ch. 259.101 9(e) (1998). Also, the Florida Preservation 2000 Trust Fund, Fla. Stat. ch. 373.045, requires that an agency purchasing land rights with fund disbursements "protect the natural resource value of the land."

a demonstrated environmental interest in the property could most likely obtain an administrative hearing to challenge the WMDs actions.[54]

Extinguishing the Contract

Contracts may contain terms that consider the possibility of a jointly-advantageous extinguishment of the contract, though most require that the contract can only be terminated by a court.[55] It may be jointly desirable to extinguish the contract if unforeseen circumstances leave the property unsuitable for conservation purposes. Examples include a major change in the habitat's characteristics due to a natural disaster and may include a property whose development becomes particularly valuable. In this case, it may be in the interest of the conservator to extinguish the easement, receive compensation, and apply that compensation to the protection of other lands.[56] The contracts consider this possibility by stating that any proceeds from a subsequent sale of the easement are to be used for conservation.[57]

Under the Florida Preservation 2000 Act, a Water Management District (WMD) can dispose of land if it determines that the land no longer needs to be preserved in furtherance of the intent of the Act.[58] The land determined to be surplus may be sold for the highest price obtainable, but in no event less than the appraised value of the land.[59] The law also specifically allows eligible lands to be acquired by an exchange of lands.[60] Accordingly, a

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[54] Although there is no prior case law that interprets this section, prior interpretation of an analogous Florida statute, the Conservation and Recreation Land statute, indicates that an environmental group would have standing to challenge government agency action when lands are not used for the designated conservation purpose. Friends of the Everglades, Inc. v. Board of Trustees of Intern. Imp. Trust Fund, 595 So.2d (Fla. 1st Dist. Ct. App. 1992) (granting FOE standing to obtain an administrative hearing challenging an agency decision to use a botanical site as a juvenile detention facility).

[55] For example, one TNC contract states: "If a subsequent, unexpected change in conditions of the Protected Property makes impossible or impractical any continued protection of the Protected Property, or surrounding property, for conservation purposes, and the restrictions contained herein are extinguished by judicial proceeding, the Conservancy, upon a subsequent sale, exchange or involuntary conversion of the Protected Property, shall be entitled to a portion of the proceeds at least equal to the proportionate value of the Conservation Easement. The Conservancy shall use its share of the proceeds in a manner consistent with the conservation purposes set forth herein. . ."

[56] The proceeds of the land's sale would be divided by the court in accordance with the conservator and landowners respective interests. Given that the development rights are the valuable commodity in this kind of case, however, the conservator will expect a large fraction of the total sale price.

[57] A related possibility is that the conservator may determine with the passage of time that other properties present more urgent conservation needs. In such instances the return of an easement restriction to the landowner may generate compensation adequate to purchase a more ecologically valuable easement or property.

[58] F.L.S.T. § 259.101(6) (1998); F.L.S.T. § 373.0564 (1998).

[59] F.L.S.T. § 373.089(1) (1998).

[60] F.L.S.T. § 259.101(6)(b) (1998).

WMD may dispose of land it holds for conservation purposes under the Act to obtain other property in furtherance of its conservation purpose.

The Cost of Acquiring Easements

The examination of easement contracts highlights a set of ongoing, long-term costs that are associated with the use of this preservation tool. These costs arise due to the difficulties associated with joint ownership of the property. Costs associated with the monitoring of land uses and management practices, contracting, and dispute resolution loom large in easement contracts. These cost are examples of the transaction, information, and enforcement costs discussed in Section 2. The acquisition cost, on the other hand, is the up-front compensation paid to the landowner in exchange for the transfer of development rights to the conservator.

The valuation of easement acquisitions is problematic, an issue to which we now turn. Because there is no conventional market for easements, the usual procedure for valuing an asset cannot be followed[61]; that is, simple observation of a market price is impossible. Unlike conventional property transactions, easement sales do not generally take place in a private real estate or easement market. No such market exists. In the case of Florida, the state itself is the major purchaser of easements. But even if the state generates a significant ongoing demand for easements, it must be noted that government procurement is not equivalent to a "market for easements." With government acquisitions there is only one buyer and the buyer's perception of value may be subjective and inaccurate. One needn't impugn the motives of state agencies to point out that without solid market data on easement values they may over-compensate for conservation. And one of the reasons there is no private market for easements is that private conservators tend to be charitable organizations. This means both that they lack the money for large-scale acquisitions and that easements can be donated to them in exchange for tax write-offs. It is in fact relatively rare for an easement to be purchased by a private entity for cash.

These difficulties with easement valuation are a downside to the use of the instrument. In effect, valuation problems imply the possibility of over-payment for easements. This over-payment may be direct, or indirect via foregone tax revenues if the easement is donated. From a conservation standpoint, over-payment is undesirable if it erodes limited financing sources. From a broader social perspective, over-payment for easements raises issues of fairness. Not only might private landowners receive too much for their holdings, but this would be at the expense of taxpayers in general (if the same revenues must be raised from other sources) or of the other recipients of public goods (if a shortfall in revenues results in a reduction in public spending).

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[61] We should be clear that we are talking about the usual *empirical* procedure for asset valuation. As a conceptual matter, an easement is a "real option," in the language of economics, and an extensive literature exists on the valuation of such assets. *See, e.g.,* Avinash K. Dixit & Robert S. Pindyck, *Investment under Uncertainty* (Princeton University Press, 1994).

4. APPRAISAL AND COMPENSATION

Easements are an unconventional form of property in that they are not easily or frequently traded. Aside from the government and a small number of conservation organizations, there are few buyers of easements. Moreover, the characteristics of easements are highly idiosyncratic, and, once sold or donated to a conservator, they are rarely if ever resold to other conservators. The lack of homogenous characteristics and resale opportunities mean that the market is highly illiquid.

The lack of transparent prices is problematic because it raises the possibility that the government or conservator's payment for easements will be excessive. From the conservator's point of view, over-compensation for easements is obviously undesirable given scarce conservation budgets. While that is a concern, an even greater concern is that over-compensation may lead to inefficient easement acquisitions. An inefficient acquisition is one where development is restricted even though the social value of the restriction is less than the private value of development. Note that this kind of acquisition can occur only if the payment for the easement exceeds the social value of the restriction. In other words, inefficient acquisitions occur only if there is an information or incentive problem within the acquiring agency or organization.

In most market situations, over-compensation is not a problem since a self-interested buyer will never pay more for something than it is worth. Buyers may not always be sufficiently self-interested, however. In certain situations involving government agencies or large firms, the employees who make purchasing decisions may be insufficiently motivated to minimize costs, for instance due to inappropriate employee incentives (e.g., rewards for "getting deals done" rather than cost minimization). Competitive bidding requirements are a tool commonly called upon to minimize this hazard. But when there is little or no competition between suppliers, as is the case with easements, competitive bidding is impractical.

Over-compensation may also be a problem when easements are donated. With a donation, the landowner makes a claim of reduced property value that in turn generates a reduction in tax payments.[62] Four federal tax benefits are available to donors. First, if the donation is made during the donor's lifetime, they are entitled to an income tax deduction for the value of the easement.[63] Second, a federal estate tax deduction exists for the bequest of a conservation easement.[64] Third, there is an exclusion from the federal estate tax for a portion of the value of the land subject to a permanent, donated conservation easement.[65] Fourth, a

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[62] In the federal sphere, the Tax Reform Act of 1976 gave explicit statutory approval for the use of easements as a form of charitable donation. Florida has no income or estate taxes, so easement donations there can take advantage only of federal tax deductions.

[63] Treas. Reg. 1.170A-14. See generally, John L. Hollingshead, *Conservation Easements: A Flexible Tool for Land Preservation*, 3 Envtl. Law. 319, 327 (1997); Stephen Small, Landowner Planning Center, Preserving Family Lands: Essential Tax Strategies for the Landowner (1992); Stephen Small, The Land Trust Alliance, the Federal Tax Law of Conservation Easements (1990).

[64] I.R.C. § 2001 (1994).

[65] P.L. 105-34, §508 (1997). See I.R.C. 2031(c) (1998) and notes 81 and 82 *infra*..

deduction exists for federal gift tax purposes for charitable donations of conservation interests.[66] As with the estate tax deduction, the value of the deduction is the "fair market value" of the contributed property interest.

It is socially desirable to minimize the deductions claimed since reduced tax revenues require tax increases elsewhere.[67] To minimize deductions, it is necessary to verify that excessive reductions in property value are not claimed. Clearly, inflated claims of reduced property value are in the interest of the landowner. Moreover, there is little incentive for the donee (the conservator) to be concerned with the tax benefits claimed by the donor. It falls to tax authorities alone to guard against excessive claims. Lack of market prices to confirm donation value create the possibility that landowners will claim inflated deductions with a social cost greater than the value of the easement.

Given the lack of market prices as indicators of value and the need to guard against over-payment, it is necessary to rely on appraisals to discipline compensation. Appraisal is a set of techniques designed to establish value when it is otherwise difficult to do so. An inherently imprecise and often disturbingly subjective process, the appraisal process does have a set of established principles to guide the technique. We now turn to a brief review of these principles and then focus specifically on appropriate methods for easement appraisal. We conclude with a review of appraisals conducted in support of a subset of the Florida easements.

Determinants of Easement Value

The value of an easement is the difference in the land's value before and after the imposition of development restrictions. To see how this would be calculated in the context of a simple example let

I^A = the land's current annual cash flow, such as from agricultural use
I^D = the land's annual cash flow as developed land
r = interest rate
t_c = the date at which the land is developed.

The value of the land unrestricted, V^U, is the sum of expected cash flows. The land earns yearly income I^A until the date of development and I^D thereafter.[68] Discounting these cash flows appropriately, the land's unrestricted value is

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[66] I.R.C. § 2522(d) (1994).

[67] While it may be tempting to view tax deductibility as a relatively "free" form of social financing, it is not. Holding the tax burden fixed (as it should be for the purposes of normative analysis) any reduction in revenues must be met by a costly increase in revenues elsewhere.

[68] One might also expect there to be a cost of land conversion at the time of a change in use (or possibly a windfall arising at the time of land conversion, due to, say, felling of standing timber). We could incorporate this cost in expression (1), but for the sake of simplicity have not done so.

$$V^U = \sum_0^{t_c-1} \frac{I^A}{(1+r)^t} + \sum_{t_c}^{\infty} \frac{I^D}{(1+r)^t} \ . \quad (1)$$

With a development restriction, the land's value V^R is equal to the net present value of income from the current use in perpetuity, or

$$V^R = \sum_0^{\infty} \frac{I^A}{(1+r)^t} \ . \quad (2)$$

The value of the easement, V^E, is the difference in value before and after the development restriction, (equation (1) minus equation (2)) so that

$$V^E = \sum_{t_c}^{\infty} \frac{I^D - I^A}{(1+r)^t} \ . \quad (3)$$

Expression (3) highlights the key issues that confront an easement appraisal. The most straightforward determination is that for the value of current use, since current income can be calculated, for example, from agricultural market prices and acreage under cultivation. The difficulty arises primarily in the estimation of income associated with future development and the date at which development is likely to occur. The cash flows associated with future development I^D are never known with certainty (unless development is imminent, in which case, market prices may be available to the assessor). Moreover, because I^D is uncertain the date of land use conversion is also inherently uncertain since a rational landowner will not convert their land until I^D is greater than I^A.[69] At issue in most easement appraisals, therefore, is the value, probability, and timing of future development. Because of the unavoidable uncertainty of these factors, appraisal values themselves are inherently uncertain and present numerous practical challenges.

The appendix presents a numerical example of a hypothetical easement valuation. In the example, an easement is valued for a property that currently earns $100,000 annual income and has the potential for $200,000 annual income due to development in the future.[70] The example explores the sensitivity of the easement's value to changes in the probability and date of future development. The results can be summarized as follows:

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[69] The date of conversion can be thought of as a random variable that depends on I^D. I^D itself should be thought of as a time-indexed probability distribution over future development values.

[70] The present value of these cash flows is estimated using a discount factor of 12 percent. While the appropriate discount rate can be difficult to establish, 12 percent is within a range common to this kind of financial analysis. As a benchmark, the St. John's River WMD appraisers employed discount rates of between 12 and 15 percent.

Probability of development	Date of development	Easement value
.2	in 5 years	$89,000
.8	in 5 years	$356,000
.2	in 15 years	$24,880

Comparison of rows 1 and 2 highlights the effect of a higher probability of development on the easement's value. The more likely is development, the higher the expected value of development income foregone by the landowner, and the higher the value of the easement. Comparison of rows 1 and 3 highlights the importance of the date of development to an easement's value. The extension of development 10 years further in the future significantly erodes the value of the easement. The delay in development means a loss in income. And income in later years is significantly eroded by the effects of discounting.

The larger lesson to be taken from this example, however, is that easement values are highly sensitive to the appraiser's judgment regarding the likelihood and timing of future land conversions. Since the probability and timing of development are always speculative, easement appraisals should be expected to exhibit a large degree of variability and error.[71]

Easement Law and Appraisal Issues

To motivate the practical difficulties associated with appraisal, consider the use of "comparable" sales as a measure of value. Comparable sales is a common technique in appraisal, but its usefulness is limited in the case of easements. Note first that a "comparable" property for the purposes of easement evaluation is one whose current use and future development use are the same as the property for which the easement has been purchased. Moreover, a comparable property is one whose *likelihood* of future development is equivalent to that of the property subject to easement. A property that is physically identical is in and of itself not an adequate property for comparison since the expected value of future development depends on the timing of development. In fact, the only truly comparable properties are those whose development is as uncertain as the property in question. Comparable sales is a useful technique primarily for the estimation of income given future development (i.e., if development were to occur, what would be its value?). It is relatively unhelpful in determining when that development is likely to occur.

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[71] The St. John's River Water Management District provided particularly careful documentation and analysis of the appraisals used to support 4 of their easement acquisitions. In all cases, appraisals were conducted by at least two appraisers. In one case, the appraisers' estimates of easement value differed by only 1.5 percent. In another, however, the estimates differed by 56 percent.

For another example, see Schapiro v. Commissioner, 61 T.C.M. (CCH) 2215 (1991) in which appraisals conducted by landowner and the Internal Revenue Service were $388,000 and $595,031, respectively--a total difference of more than $207,000. The court found in favor of the landowner.

Embedded in the methodology described in expression (3) is the notion that a property's value is a function, not only of current uses, but of what is termed "highest and best use." Highest and best use, while usually referring to the existing use of a property, can also take into account higher-value future uses. This principle is intuitive. A piece of land near a city center is clearly more valuable than a similar piece of land miles from any development, even if both parcels are currently vacant. U.S. appraisal law is unambiguous in its acceptance of the proposition that future uses may be relevant to a property's appraised value.[72] For instance, U.S. Department of Justice guidelines for federal land acquisition appraisals state that "if the property is clearly adaptable to a use other than the existing use, its marketable potential for such use should be considered in determining the property's fair market value."[73]

Both federal guidelines and the common law, however, place some limitation on what can be claimed as a valuable future use. Specifically, potential uses cannot be based on "mere speculation and conjecture."[74] The legal standard is that there must by a reasonable probability that the land is adaptable to the claimed future use and that there is a demand for that use in the reasonably near future.[75] This standard guards against gross abuses. However, it is obviously difficult to attach objective meaning to "reasonable probability" of adaptability and "reasonably near" dates of conversion. After all, any development that has yet to occur is by definition speculative. In practice, future development potential is almost always granted some value by appraisers and courts. Courts increase the allowed easement value as the likelihood of future development increases, but some positive value is almost always granted for tax deduction purposes.[76] Documentation and quantification of the likelihood of land conversion is always important. But if present, a positive valuation is effectively guaranteed. Typically, easement valuations range from 20 percent of the land's estimated total value to upwards of 90 percent.[77] In *Stotler v. Commissioner*, for example, a tax court granted a 91 percent reduction in value for an easement attached to a coastal property.[78] The case went to court, and the court supported the landowner plaintiff, because the IRS assigned no value to development potential in its appraisal of the property. While this is a particularly large award, it is illustrative of the potential importance of future value to appraisal valuations. And when sold, easements typically command a comparably meaningful fraction of the property's total

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[72] Stanley Works v. Commissioner, 87 T.C. 389 (1986) (finding a 75 percent reduction in property value due to an easement that prevented the development of a hydroelectric facility).

[73] U.S. Dep't of Justice, Uniform Appraisal Standards for Federal Land Acquisitions (1992). Available at http://www.usdoj.gov/enrd/land-ack/table.htm#toc.

[74] *Olson v. United States*, 292 U.S. 246, 257 (1934).

[75] *Id.* at 255..

[76] *See* Fannon v. Commissioner, 56 T.C. 1587 (1989); Symington v. Commissioner, 87 T.C. 892 (1986).

[77] For a detailed review of easement cases and valuations, as well as an exhaustive treatment of easement law, see The Land Trust Alliance and National Trust for Historic Preservation, *Appraising Easements: Guidelines for Valuation of Historic Preservation and Land Conservation Easements*, (1990).

[78] 53 T.C. 973 (1987).

value. The Florida easements purchased by the state water management districts range in value from 28 to 60 percent of the properties' total value.[79]

Additional Factors That Affect Future Development Value

It is worth noting several factors that will commonly affect future development value (the value of I^D). First, existing regulatory restrictions, such as zoning prohibitions, may limit the claimed value of future deductions. For instance, commercial development cannot be claimed as a source of possible future value if the property is zoned only as agricultural or residential property.[80] Another pertinent regulatory example is wetlands that are regulated under the Clean Water Act or lands providing habitat for endangered species as defined by the Endangered Species Act. Under these statutes, land conversion may already be prohibited, thus eliminating the possibility of valuable future development.

Second, demographic data speaks to the likelihood and timing of future development. Nearby commercial, residential, and public infrastructure projects are a quantifiable signal of increased development potential. In this regard, provisions contained in the Taxpayer Relief Act of 1997 are of particular interest.[81] Among other things, the Act provides a tax "exclusion" for properties that donate a conservation easement worth at least 30 percent of the property's total value.[82] The 30 percent threshold itself ensures that the easement donation is substantive. In addition, however, the exclusion is not available unless the property is within a 25 mile radius of a metropolitan statistical area, national park, national wilderness area, or within 10 miles of an urban national forest as designated by the U.S. Forest Service.[83] These provisions are a blunt but pragmatically justifiable attempt to limit federal tax incentives to properties either where future development is reasonably near or where there are significant aesthetic and ecosystem benefits from proximity to already-protected areas.[84]

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[79] We might, in fact, speculate that there would be an upper bound of less than 100 percent on the share of easement value in total property value among properties on which conservation easements are purchased. As we have discussed, the purchase of an easement may oblige the purchaser to undertake monitoring and other functions on the land that would be more expensive than those she would have to conduct if she simply owned the land outright. Purchase of fee simple ownership should, then, be preferable, when virtually all of a property's value is to be ascribed to its development potential.

[80] Zoned land is useful to easement appraisers since the market value of properties where development is already restricted by zoning can be used to estimate reductions in value associated with restrictions.

[81] P.L. 105-34 § 508 (1997). The Act amends the Internal Revenue Code, adding section 2031(c).

[82] The exclusion is distinctive in that its value is defined by the property's value after the easement's value is subtracted and thus is unrelated to the value of the easement itself. 26 I.R.C. 2031(c). Thus, the exclusion is different from a tax deduction, since a deduction is defined by the value of the property being donated. For a detailed description of the Act's provisions see C. Timothy Lindstrom and Stephen Small, *New Estate Tax Relief for Land Under Conservation Easement*, Tax Notes at 1171, March 2, 1998.).

[83] 26 I.R.C. 2031(8).

[84] The eligibility test is less stringent than it first appears since the metropolitan statistical area designation is often applied to the entire county in which urban development is found.

Third, a sound appraisal must take into account the potentially positive effects of the restriction on the value of neighboring parcels owned by the landowner. Conservation easements can enhance the value of the landowner's residential tract, for instance, or provide aesthetic value to a neighboring parcel where the landowner has an interest. These positive effects must offset the reductions in value claimed by the donor. They are also clearly factors that affect the donor's bargaining position *vis-a-vis* an agency that is purchasing easements. This principle is reflected in the federal tax code and is based on long-standing law regarding the appropriate compensation for takings of property. In takings cases, compensation is reduced by any reasonably estimable benefits to the "remainder" of the property.[85]

Appraisal in Practice: Examples from the St. John's River Water Management District

To illustrate the challenges faced by appraisers in the field, we explored in detail the appraisal reports submitted in support of four easement acquisitions by Florida's St. John's River Water Management District. Several of the considerations described above influenced appraiser valuations in these cases. For example, all of the appraisers attempted to use a comparable sales approach. In pursuit of this, it was common for the appraisers to search for sales of "similarly encumbered property." Finding none in Florida, the appraisers made frequent reference to easement purchases in Pennsylvania that equaled between 50 and 59 percent of the properties' full value. Also, it was common to look at the effect of zoning restrictions on property value in Florida. Several of the appraisers compared zoned land values to non-zoned land values in other counties and concluded that comparable zoning restrictions in Florida led to reductions in property value of between 30 percent and 92 percent, with an average of roughly 55 percent. Out of all of this, one appraiser chose to value the easement in question at a relatively modest 35 percent of the fee-simple value because the property was "extremely limited from the standpoint of present economic development potential." These attempts to frame the value of easements indicate the difficulty and relatively *ad hoc* nature of the process. It also deserves mention that a 35 percent reduction in land value for a property with "extremely limited" development potential seems quite large. Finally, the use of easement valuations in Pennsylvania to estimate the value of easements in Florida must be approached with care. As noted above, those properties are comparable only if the probability and timing of their development is similar to that of the parcel in question. The appraisal reports made no effort to demonstrate that that was in fact the case.

Several other techniques are worthy of mention. One appraiser looked at land values in "remote rural areas of the state" in order to gauge values of land with "almost no development potential." Care was also taken to judge whether the property in question actually had any development potential to begin with. In one case, a property's "muck content," rather than the presence of an easement, was judged to significantly limit its future development. That

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[85] United States v. River Rouge Improvement Co., 269 U.S. 411, 415-416 (1926); Bauman v. Ross, 167 U.S. 548, 570 (1897); Washington Metropolitan Area Transit Authority v. One Parcel of Land in Montgomery County, Md., 691 F.2d 702, 704 (4th Cir. 1982).

appraiser adjusted the property's value downward by only 3 percent due to the extinguishment of residential development rights.

In general, the properties were broken into distinct land parcels differentiated by land type (e.g., forest, wetland, residential). Appraisal was then conducted separately for the different types of land within a given property. Thus, comparable sales of wetlands were applied to the estimation of that fraction of the property that was currently in, or likely to remain wetland. When forestry income is being generated from the property that income is estimated and deducted from the property's value if logging is restricted by the easement. Similar adjustments were made for hunting income. In one case, an adjustment was made to take into account an increase in agricultural production costs that would arise from the presence of the easement.[86]

Appraisal and the Social Value of Easements

It is worth noting that the value of the easement defined in equation (3) is not a function of the easement's *social* value. This is because the goal of appraisal is a determination of the easement's private value (its value to the landowner). The easement's social value is certainly relevant from the standpoint of conservator acquisition strategies--an issue we will turn to in the next section. For the purposes of tax valuation, however, the social value of a parcel does not bear on the benefits that can be claimed by a donating landowner. This follows since the social value of the property is usually independent of its market (and thus private) value.[87] And in fact, federal appraisal standards expressly prohibit the introduction of social value as a determinant of assessed value.[88]

A property's social value may be more relevant when the easement is being purchased, rather than donated. When an easement is offered for sale, the landowner can use the property's social value, and the conservator's desire to preserve socially valuable property, to increase the purchase price.

The difference between an easement's private and social value raises another issue. It is possible that an easement donation's tax-related value may exceed the ecological or aesthetic value of the easement. An easement in an already developed area, for instance, may

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[86] The property in question involved a dairy to be closed as part of the easement agreement. Formerly, the land's agricultural output supported the on-site dairy operation. Closure of the dairy required the landowner to ship its output off-site, at additional cost. This cost was included as a component of the easement's cost.

[87] A possible exception to this statement might arise if there were a concerted effort made--and consistent criteria identified--to assure the socially optimal level of habitat conservation. If this were the case we could say that the social value of all properties chosen for conservation was at least as great as the private cost, and that for at least some property they would be the same; conservation would continue until the social "demand" and the private "supply" of conserved habitats were equated. Such an optimal outcome is well beyond the capability of current evaluation methods, however.

[88] *See* Interagency Land Acquisition Conference Position Paper, U.S. Dep't of Justice, Apr. 14, 1995, which states that "…highest and best use, as used in the Uniform Appraisal Standards for Federal Land Acquisitions, is to be estimated in economic terms. Implied in the forgoing is that highest and best use is an economic concept, not a social concept."

have relatively little social value, while yielding large potential tax benefits to the donor. In this kind of case, it is undesirable to allow charitable donation of the easement since its social cost (in the form of foregone tax revenue) exceeds the social benefit. For this reason, easements eligible for tax benefits must satisfy some form of "conservation purposes test." This is a somewhat vague standard, but one that guards against frivolous easement donations.[89]

Safeguards Against Over-Valuation

When easements are sold, the value of the easement is openly negotiated between the landowner and conservator or acquiring agency. The conservator's expenditure of its own resources and both parties' ability to walk away from the deal disciplines extravagant landowner claims regarding the easement's value (though as noted earlier appraisals remain a useful compliment to the process). When easements are donated, however, this discipline is largely absent. With donations, it falls to state and federal tax authorities to validate and police valuations claims *ex post*. Given the unavoidable subjectivity of appraisal analysis, there is ample slack in a landowner's ability to claim value. Existing safeguards include a variety of penalties contained in the Federal Tax Code for overstating the value of charitable contributions. To underscore the lack of precision in appraisal valuations, penalties for overstatement of a conservation easement's value can be levied only if the overvaluation was found to exceed the "true" valuation by more than 200 percent.[90]

Other safeguards include the requirement that appraisers be certified and that fees earned are not to be based on the value established by the appraiser. Also, in some cases, the donee must be notified of the donor's tax appraisal claims.[91] While not liable for penalties associated with over-valuation, conservation organizations have some long-run incentive to not encourage abuse of the tax system. This incentive itself may be attenuated by circumstances, however. The prospect of an immediate gain from acquiring a desirable property might sometimes outweigh long-term costs associated with increased government scrutiny.

5. THE CHOICE OF PARCELS FOR PROTECTION

The two previous sections described a host of legal, economic, and implementation issues that arise from the use of easements as a conservation tool. It deserves emphasis that the conclusions drawn from that analysis are also applicable to the analysis of other

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[89] The Internal Revenue Code defines a legitimate conservation purpose as being "the preservation of land areas for outdoor recreation by, or for the education of, the general public; the protection of a relatively natural habitat of fish, wildlife, or plants, or similar ecosystem; the preservation of open space (including farmland and forest land) where such preservation is … for the scenic enjoyment of the general public, or … pursuant to a clearly delineated Federal, State, or local governmental conservation policy, and will yield a significant public benefit." 26 I.R.C. § 170(h)(4)(a).

[90] 26 I.R.C. § 6662(e)(1)(a). The penalty is 20 percent of the tax underpayment.

[91] 26 I.R.C. 6050L.

conservation policies. For instance, valuation and appraisal issues must be confronted when using tax incentives to drive land use changes or when constructing a market for development rights or wetland banking. This is true because knowledge of land values is central to understanding the incentives generated by policies. Monitoring and enforcement also figured prominently in our analysis of the easement contracts. Here too, the lessons apply to the analysis of other policies. Enforcement of land use and management commitments is a challenge present in any approach to conservation.

We now turn to another issue that is fundamental to the effectiveness of easements and any other conservation tool: the way in which they select individual parcels for protection. Note that the preceding analysis of easements and their valuation largely sidestepped the question of how or why the specific sites were chosen. Since the spatial pattern of conservation reserves is important to their effectiveness in protecting threatened species, we now address this issue in more detail.

Combinatorics and Conservation Planning

Conservation planning can be complicated immensely by the sheer number of different possibilities facing planners. Consider a simple example. Suppose that it has been determined, for whatever reason, that 30 percent of land in a particular area should be conserved for endangered species habitat. If the landscape is partitioned into ten equally sized parcels, there are 120 ways in which 30 percent--three out of ten--parcels can be chosen for conservation. If the landscape were defined less coarsely--suppose that each of the ten parcels were split into four equal parts, and a dozen of the resulting 40 parcels were to be chosen to be preserved--there would be 5.6 *billion* possible configurations from which to choose! Even a problem as simple as choosing thirty parcels from a hundred admits a number of configurations on the order of thirty *trillion trillion* (3×10^{25}).

Two conclusions follow from this stunning proliferation of possibilities. The first is simply that, among any very large number of possible configurations of preserved habitats, there will almost surely be some that represent very good value-for-the-money. It may be worth digressing for a moment to emphasize this point. Much of our exposition has advised sobriety and realism in appreciating the very real costs of habitat conservation. There are, however, also some reasons for optimism, and we have just identified one. Substantial conservation may be accomplished at relatively low cost by intelligent choice of reserves.

The second conclusion we can draw from the sheer complexity of the problem is that identifying the very best possible configuration of reserves is tremendously difficult. One can make the number of parcels over which selection occurs larger and larger by dividing them more and more finely. Even finding workable approximate solutions can be daunting when there are many parcels from which to choose. Despite the formidable computational challenges involved, researchers have developed techniques for identifying "optimal" reserves sufficient to protect hundreds of species from among thousands of parcels. A procedure that has been followed by several researchers is to take a map of a particular area, overlay it with a grid, determine from biological information which species are to be found in each cell of the

grid, and then to determine the maximum number of species that can be conserved for either any fixed number of grid cells, or any fixed dollar expenditure determined from the prices of land in the cells chosen.[92] These exercises confirm the first point we made above: enlightened site selection can save considerable sums over an uncoordinated strategy. But while this finding is statistically unexceptionable, it does not provide much useful guidance for conservation planners.

This is so for a couple reasons. An economic consideration related to the matters that we have discussed above is that existing approaches to the "Reserve Site Selection Problem," as the procedure we have discussed above has come to be called[93], have assumed either that all land is of equal value, or that value can be proxied by some summary statistic for the geographical region.[94] There would be nothing, in principle, to prevent the same exercise using prices of easements rather than the fee-simple purchase price of land. For reasons already discussed, however, it would be near-impossible to determine such easement prices. Moreover, the problem becomes vastly more complex when it addresses not only the lands to be conserved, but also the intensity of conservation to be practiced.

More fundamentally, the assumptions required to make the Reserve Site Selection Problem tractable beg some important questions. The assumption that each of many different species would be assured survival by the preservation of a single area of habitat of uniform size is extremely heroic. Different species have different area requirements, and a species' probability of survival is surely greater when it is represented in more than one grid cell. More troubling still is the fact that contiguity and configuration also affect the conservation efficacy of any particular area of habitat.

The reasons for which configuration matters are too numerous and subtle to explore in detail here. Let us instead just give a few examples. Obviously, larger animals tend to require larger territories, as do animals which tend to be sparsely distributed, such as large predators. Thus, small reserves may not only not contain certain species, but may also be dramatically affected by the absence of, for example, predators whose function is to control herbivorous populations. Moreover, different configurations of even contiguous habitat differ in their ecological characteristics even if their overall areas are identical. A long thin stretch of preserved habitat may, for example, differ substantially from a circular reserve of the same area, in that the former contains a much larger "edge" than does the latter. Edges are transitional regions that may differ in their species composition, micro-climatological, and

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92 Amy Ando et al., *Species Distributions, Land Values, and Efficient Conservation*, Science (March 27, 1998); B. Csuti et al., *A Comparison of Reserve Section Algorithms Using Data on Terrestrial Vertebrates in Oregon*, 80 Biological Conservation 83 (1997).

93 *See, e.g.*, Jeffrey L. Arthur et al., *Finding All Optimal Solutions to the Reserve Site Selection Problem: Formulation and Computational Analysis*, 4 Env. & Ecological Stat. 153 (1997).

94 Ando *et al*. used the price of farmland at the county level in their calculations. *Supra* note 92.

other attributes from interior areas.[95] The effects of configuration continue to be debated. The "SLOSS" debate, between advocates of a *S*ingle *L*arge, as opposed to *S*everal *S*mall reserves has not been resolved.[96] This should not be taken as evidence that these problems are insoluble, but rather as evidence that answers are likely to be place and time-specific.

It has also been argued that site-selection issues have been largely obviated by events: those areas chosen for conservation are, increasingly, simply those areas in which there remains something to conserve.[97] This view, however seems to us excessively pessimistic, and is itself countered by the fact that biologists, public policy makers, and others are, in fact, attempting to identify which subset of existing more-or-less "natural" areas should be devoted to conservation. Thus the issue of which lands to select for conservation remains as important as that of how to motivate conservation on selected lands.

Again, reserve selection is a very complicated matter, and we cannot add much more here to the extensive body of work that already exists on the issue. What we can note, however, is that different strategies can have very different implications with respect to the lands chosen for conservation. As we noted above, different strategies differ with respect to the conservation outcomes they may induce. At one extreme, regulation simply imposes use restrictions on parcels of land chosen specifically for their conservation attributes. At the other extreme, preferential tax treatment and tradable permit strategies result in owners electing to practice conservation on their properties only when the private benefits of doing so are sufficient. Private benefits arise from the tax relief or earnings from the sale of development rights and any personal satisfaction that arises from keeping land in its natural state. Because ostensibly similar owners can make very different decisions regarding their properties flexible incentive schemes can lead to a great deal of uncertainty regarding which properties will be volunteered as reserves.

It is, of course, possible to target specific sites when purchasing fee-simple or partial interests in properties. Thus, one might say that purchase strategies are comparable to regulation in being able to target *exactly* the areas desired. While this may be literally true, following so rigid an acquisition strategy may be unwise for other reasons. We summarize these reasons next.

Some Economic Considerations in Habitat Acquisition

The most important economic consideration in habitat acquisition is one we have already summarized above: by thoughtful planning, one can maximize protection by accounting for the costs of acquisition. Put differently, the particular area of land in which the most endangered species are concentrated may or may not be the best choice for a reserve.

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[95] Denis A. Saunders et al., *Biological Consequences of Ecosystem Fragmentation: A Review*, 5 Cons. Biology 18 (1991).

[96] *See, e.g.*, P. Aengst et al., *Introduction to Habitat Conservation Planning*, 14 Endangered Species Update 5 (1997).

[97] Saunders et al. *Supra* note 95.

Consider an example. Suppose that a 1000 hectare reserve area has, on average, .01 species per hectare and can be purchased for $500 a hectare. This implies that the 1000 hectare purchase will preserve ten species for an expenditure of $500,000. Now consider a more ecologically rich area, where species are present at a rate of .02 per hectare. If land prices in this reserve area are higher, say $2000 a hectare, the same $500,000 will lead to a smaller amount of land acquisition and therefore a lower amount of species protection (five species). The cost difference in land means that the ecologically less desirable reserve, on a per-hectare basis, will in fact lead to the most protection.

It remains an open question as to whether species-rich areas tend to be more or less expensive than other lands. Researchers have found that conservation can be achieved at lower total cost by looking for "bargains" than by choosing only the ecologically richest sites.[98] On the other hand, some researchers have suggested that species-rich areas are biologically diverse for the same reasons that they tend to be economically undesirable.[99] It seems doubtful, however, that any general conclusion will emerge concerning the relationship between economic property values and biodiversity.

This last conclusion could be more strongly stated. Economic value is often determined by idiosyncratic attributes of land and landowner, so a cost-effective conservation strategy would be one which takes advantage of opportunities to acquire properties whose owners are most receptive. In short, then, a rational acquisition strategy will likely be one which resembles an auction,[100] in which "bids" are taken from competing would-be suppliers. These "bids" would, of course, be evaluated according to criteria more complicated than simply dollars-per-hectare. Number and identity of species sheltered, proximity to other areas of actual or potential habitat, and other ecological considerations would also be evaluated.

Let us conclude this section by mentioning one such consideration for evaluation. In addition to the preservation of endangered species, intact ecosystems provide a number of other valuable goods and services to society. These include soil retention, water and nutrient cycling, flood protection, recreational opportunities, and a host of others.[101] While these services are clearly valuable to society, they are not generally assigned appropriate prices for the purposes of social decision-making. Ecosystem services are public goods (goods from which many can benefit without making any contribution for their provision). There are, however, some instances in which appropriate incentives can be generated for providing public goods. People like to have parks near the areas in which they live. More and more, the public preference is for parks preserved in a more-or-less "natural" state. Land developers

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98 *Cf.* Ando et al., *supra* note 92, *and* A.P. Dobson et al., *Geographic Distribution of Endangered Species in the United States*, 275 Science 550 (1997).

99 M. Huston, *Biological Diversity, Soils and Economics*, 262 Science 1676 (1993).

100 We are not suggesting that an actual auction be conducted. Rather, we are saying that an effective mechanism for identifying and acquiring conservation reserves will be one in which, as in an auction, competing bids can be evaluated simultaneously.

101 *Nature's Services: Societal Dependence on Natural Ecosystems* (Gretchen C. Daily ed., Island Press 1997).

can recoup the opportunity costs of maintaining parts of the areas they develop in parkland to the extent that this enhances the value of the adjoining properties they do develop. While this strategy of piecemeal conservation does have its limits--areas left undeveloped within larger developments are necessarily restricted and insular--negotiation with developers to maximize the undeveloped areas they retain may create some opportunities for "win-win" conservation strategies. Some habitat is preserved, while commercial values may be enhanced as a result.

6. CONCLUSION

Public support for, and increased government involvement in, land conservation initiatives call for an analysis of alternative preservation policies. No policy can avoid the inevitable opportunity costs of land use restrictions. Preferences for one policy over another must therefore be rooted in a detailed analysis of the policies' implementation. Each of the alternatives--the acquisition of property rights, trading and banking programs, and tax-based incentives--raises a set of legal, institutional, and economic issues. A detailed analysis of conservation easements suggests that interactions with property markets, land management, bureaucratic incentives, and a variety of legal issues are likely to profoundly influence any policy's overall effectiveness. Difficulties associated with the long-term enforcement and monitoring of land use restrictions, the lack of market prices as indicators of value for appraisal, and the way in which incentives target specific properties for protections were highlighted by the analysis. Attention to these issues, regardless of the policy approach, will lead to the most effective and valuable conservation at the least cost.

Our analysis has been based on a limited number of existing easement contracts, an examination of the considerations that motivate their terms, and an admittedly speculative effort to foresee what other problems may arise in constructing fair and effective instruments for conservation. In closing, it is worth reiterating that considerable additional experimentation will be required in order to determine which arrangements best accomplish conservation objectives in specific circumstances. Rational foresight can certainly help in structuring effective policy instruments. But regrettably, trial and error, conflict, and--in all probability--litigation will be required before practices converge to settled norms. We hope that our findings will be of use to policy makers, conservators, and planners as they map their own strategies. Only experience will provide definitive answers, however. The best advice that can be given now is that conservators and policymakers continue to experiment with innovative approaches for meeting new land use objectives.

APPENDIX

The Value of an Easement: A Numerical Example

Consider a property that generates $100,000 in annual income. There is a .2 probability that in 5 years the land will be developed and thereafter generate $200,000 in annual income. The discount rate is 12 percent and present values are calculated over a 30 year horizon. What is the value of an easement that extinguishes the right to development?

The property's value under easement

With an easement in place, the land's value is the present value of $100,000 over 30 years. Given a 12 percent discount rate, this is equal to

Land value with restriction (the 'after' value) = $805,500.

The property's value if developed

The value of the land--if developed--is the present value of $100,000 annual income in the first five years and $200,000 annual income over the last 25 years. Given a 12 percent discount rate, this is equal to

Land value if developed = $1,250,500.

The property's value absent an easement

This value is an expected value, since development is expected to occur only with a .2 probability. With probability .8 the land will earn $100,000 over the full 30 years. Thus,

Land value without restriction (the 'before' value) =

(.2)($1,250,500) + (.8)($805,500) = $894,500.

The easement's value

The easement's value is the expected property value foregone by the landowner due to extinguishment of the development right. This is equal to the difference between the 'before' and 'after' values.

The easement's value = ($894,500) - ($805,500) = $89,000.

The easement's proportional value

The easement's proportional value is the fraction of the easement's value, relative to the property's total, unrestricted value, or

Proportional value = ($89,000) ÷ ($894,500) ≈ 10 %.

The Sensitivity of Easement Value to the Probability and Timing of Development

To show how an easement's value is sensitive to the judgments of the appraiser, consider the effect of changes in the perceived probability and timing of development.

If development is more likely

Instead of a .2 probability of development, assume that development occurs with probability .8. A higher probability of development increases the expected value of the property 'before' an easement. Specifically,

Land value without restriction (the 'before' value) =

(.8)($1,250,500) + (.2)($805,500) = $1,161,500.

If development is considered to be more likely, the value of development is weighted more heavily in the land's expected value. In other words, the expected value foregone by the landowner is greater. This increases the value of the easement.

The easement's value = ($1,161,500) - ($805,500) = $356,000.

Note that the increased probability of development has a significant impact on the total and proportional value of the easement.

Proportional value = ($356,000) ÷ ($1,161,500) ≈ 31%.

If development occurs later in time

Returning to the original example, we now vary the date at which development occurs, rather than the probability with which it occurs. Assume that development occurs in 15 years, rather than in 5.

This changes the "if developed" value of the land. The land's value--if developed--is now the present value of $100,000 annual income in the first fifteen years and $200,000 annual income over the last 15 years. Given a 12 percent discount rate, this is equal to

Land value if developed = $929,900.

The land's expected value without an easement is therefore

Land value without restriction (the 'before' value) =

(.2)($929,000) + (.8)($805,500) = $830,380.

Note that the delay in development reduces the value of the easement.

The easement's value = ($830,380) - ($805,500) = $24,880.

Proportional value = ($24,880) ÷ ($830,380) ≈ 3%.

Judgments regarding the probability and timing of future development are inherently speculative. This, with the sensitivity of easement values to development's probability and timing, means that easement appraisals themselves will be highly variable and may exhibit a large degree of error.