

Land Trusts and Conservation Easements: Who Is Conserving What for Whom?

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Abstract: *Land trusts, partnered with government agencies or acting alone, are working to conserve habitat, open space, and working landscapes on private land. Spending both public and private funds, such institutions frequently acquire less than full title by purchasing or accepting donations of conservation easements. These title and organizational arrangements are evolving so fast that it is difficult to assess their conservation accomplishments and long-term viability. To understand the contribution of these arrangements to the preservation and restoration of biodiversity, conservation biologists need to identify the biological resources likely to be conserved and those likely to be left unprotected through easements held by land trusts. We describe land trusts and conservation easements and why they are currently an attractive approach to land protection. Our review of the literature showed that little information is available on (1) the resulting pattern of protected lands and resources being conserved, (2) the emerging institutions that hold conservation easements and the landowners they work with, and (3) the distribution of costs and benefits of land trusts and easements to communities and the general public. The prescriptive literature on how to establish land trusts and negotiate easements is extensive. However, easily available information on protected resources is too aggregated to determine what is actually being conserved, and more detailed data is widely scattered and hence difficult to synthesize. The social science literature provides some insight into the motives of landowners who participate but offers little about the variety of institutions or which type of institution works best in particular ecological and political settings. Equally undeveloped is our understanding of the inherent tension between the public and private benefits of this widely used incentive-based conservation strategy. Interdisciplinary research is needed to determine the ecological and social consequences of acquiring partial interest in private land for conservation purposes.*

Patronatos Agrarios y Servicios de Conservación: ¿Quién Está Conservando Qué para Quién?

Resumen: *Los patronatos agrarios, en sociedad con agencias gubernamentales o actuando por su cuenta, están trabajando para conservar hábitat, espacios abiertos y paisajes de trabajo en terrenos privados. Con fondos públicos o privados, estas instituciones frecuentemente adquieren poco menos que el título completo al adquirir o aceptar donaciones de servicios de conservación. Este título y arreglos organizacionales están evolucionando tan rápido que es difícil evaluar sus logros de conservación y su viabilidad a largo plazo. Para comprender la contribución de estos arreglos a la preservación y restauración de la biodiversidad, los biólogos de la conservación necesitan identificar aquellos recursos biológicos con probabilidad de ser conservados y aquellos que probablemente queden desprotegidos por los servicios de conservación que tienen los patronatos agrarios. Describimos los patronatos agrarios y los servicios de conservación y las causas por las que actualmente constituyen un método interesante de conservación. Nuestra revisión bibliográfica mostró que hay escasa información sobre (1) el patrón resultante de terrenos protegidos y los recursos conservados, (2) las instituciones emergentes que mantienen servicios de conservación y los propietarios con que trabajan y (3) la distribución de costos y beneficios para las comunidades y el público en general. La bibliografía que describe cómo establecer patronatos agrarios y negociar servicios es extensa. Sin embargo, la información sobre recursos protegidos fácilmente disponible está demasiado agregada como para determinar que se está*

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conservando realmente, y los datos más detallados están muy dispersos y, por lo tanto, son difíciles de sintetizar. La bibliografía de ciencias sociales nos permite comprender los motivos de los propietarios que participan pero nos ofrece poca información sobre la variedad de instituciones o el tipo de institución que funciona mejor en determinados escenarios ecológicos y políticos. Igualmente, nuestra comprensión de las tensiones inherentes entre los beneficios públicos y privados de esta estrategia de conservación basada en incentivos está poco desarrollada. Se requiere investigación interdisciplinaria para comprender las consecuencias ecológicas y sociales de la adquisición de interés parcial en terrenos privados para los propósitos de la conservación.

Introduction

Since the late 1800s, the central approach to land conservation in the United States has been government reservation or acquisition (Raymond & Fairfax 1999). But institutions and policies developed primarily in the western public domain do not necessarily meet today's conservation needs. Parks and national forests, for example, have seldom been configured optimally for biodiversity conservation, and their establishment has often abused and alienated indigenous and rural residents (Spence 1999). Historic land-disposition practices allocated the more productive and well-watered lands to private landowners, along with critical wildlife habitat (Maestas et al. 2001; Scott et al. 2001). Consequently, some habitat for 95% of all federally threatened and endangered flora and fauna is on private land, and 262, or 19%, of these species survive only on private parcels (Wilcove et al. 1996). Biodiversity conservation efforts must include private land.

Landowners interested in preserving their autonomy obviously favor incentive-based, voluntary conservation for private-land resources. The increasing appeal of these kinds of initiatives to the conservation community and the public (Turner & Rylander 1998) derives from (1) increasing land values and the high cost of government land management; (2) disenchantment with gridlocked public land-management and resource agencies; and (3) the insensitivity of centralized regulatory authority toward local communities.

Backlash in response to complex environmental regulations affects conservation efforts on both public and private lands. For many, these regulations and the agencies that enforce them exemplify high-cost bureaucracy, gridlock, and insensitivity. In particular, the U.S. Endangered Species Act has become a lightning rod for growing frustration with the government regulatory approach (Turner & Rylander 1998). Regional and statewide land-use planning is seen as the logical solution to prevent future crises (Fulton 1999) but does not always protect threatened habitats or preserve agricultural land. For example, in Marin County, California, land-use planning has been successful at conserving land in recent decades (Marin County 1972; Hart 1991). However, protecting open space and agriculture eventually required private efforts led by the Marin Agriculture Land Trust because the

initial conservation strategies failed to maintain sufficient safeguards against development pressures and because landowner opposition increased. At present, governmental land-use planning and federal land acquisition seem too widely perceived as a threat to private property rights to be a useful broad-scale conservation strategy. Moreover, land-use planning may always be subject to change during the next revision of the general plan. For all these reasons, nongovernmental organizations and environmental interests have gravitated toward the use of incentive-based conservation on private land as an ostensibly permanent conservation tool.

Conservation easement acquisition is largely a voluntary, incentive-based approach that relies on continued private ownership and management of land used to meet conservation goals, thus avoiding the high financial costs and difficult political issues associated with public acquisition and management. A land trust usually acquires the easement, which limits development and perhaps other activities on the land. Conservation easements typically cost less than a full-fee acquisition (Main et al. 1998) and may help landowners meet personal goals, such as maintaining the land for farming, reducing friction among heirs, assuring a home site for children, or contributing open space and protecting habitat (Wright 1993). In contrast to public acquisition, the land remains on the tax rolls (usually at a reduced rate), and in some cases this can engender community support.

The economic upswing of the 1990s provided an abundance of private and public money to support incentive-based conservation programs that had tangible outcomes such as a piece of property or partial interest in one. Despite the recent economic downturn, acquisition of partial interest in private land to protect natural and agricultural resources, through a blend of public and private institutions and funding, remains on the rise. In addition, some local governments have recently started requiring builders to transfer the rights of some land to protect open space, promote denser development, and provide mitigation for environmental impacts.

The widespread acceptance of conservation easements may result from disillusionment with one-size-fits-all federal regulation and management, but the variability in the properties, organizations, and institutions involved means that assessing the outcome of this new approach

to land conservation is extremely difficult. The economic and political conditions that have led to the prominence of land trusts and conservation easements are no doubt as transitory as those that previously supported the acquisition of public lands, but the easements are not transitory and will remain long after the ecological and social context has changed. Conservation biologists need to look closely at easements and the organizations that hold them to assess their effectiveness at protecting biodiversity and their ability to respond to social and ecological change over the long term. This calls for an interdisciplinary research effort.

Conservation Easements

Rights of way for access, severed mineral title, and hunting easements are familiar tools of land management. They reflect a “bundle-of-rights” concept of land ownership, meaning that different rights in a property can be sold or owned separately. A conservation easement is a contract that divides portions of the land title between the landowner, or fee holder, and an easement holder. Although the term is defined generally in state law (Mayo 2000), a conservation easement has no specified content—it says whatever the parties agree to. Typically, a conservation easement transfers some development and management options—such as the right to subdivide or to cut trees—from the fee holder to a nonprofit or governmental organization that holds those rights, called a “nonpossessory interest” in the land. The fee holder reserves certain rights, such as the right to build additional homes, add roads, or plant row crops. The fee holder may donate or sell the rights that are relinquished, and pays property taxes only on the remaining value of the land. The fee holder also continues to own the property and manage it within the bounds set by the easement. The easement holder is responsible for monitoring and enforcing easement specifications.

Each landowner has unique goals, distinct financial needs, and different land and resource endowments. Each land trust also has its own priorities, style of operation, and varying resources for making transactions and stewarding easements. The differences result in a variety of easement terms and, we hypothesize, conservation outcomes.

Experienced easement negotiators disagree on the level of detail needed in an easement contract, which is a legally enforceable document that becomes a permanent part of the property title. Some argue that effective easements contain only broad and straightforward prohibitions. Specific and detailed management prescriptions, according to this view, are best left to a more easily amended management plan.

If an easement requirement cannot be readily monitored, it likely cannot be enforced. Some organizations

have adopted monitoring practices that do not allow for regular verification that the terms of the easement are being met by the landowner. For example, an annual walk-through or fly-over may not detect violations of easement restrictions on hunting or pesticide use but is adequate to detect new structures. The easement may require that the landowner post “no hunting” signs or maintain organic certification on the property, but this does not assure compliance.

Conservation easements are frequently referred to as being perpetual. But there is debate in the literature on what perpetuity in conservation easements actually means (Jordan 1993), and perpetuity is not an essential part of an easement. In fact, easements are frequently set up for a specified period of time or even leased. What happens when circumstances change? An early application of the tool is The Great River Road along the Mississippi River, protected by conservation easements held by the State of Wisconsin (Whyte 1968; Ohm 2000). In this case, the state has amended many of the initial easements. Some amendments permit more flexible resource-management guidelines, allowing, for example, the cutting of trees killed by Dutch elm disease. Other amendments appear to rescind important protections.

Some flexibility is necessary for a land-management regime intended to be perpetual. What happens if the easement prohibits all land uses but ranching becomes economically nonviable in a region? Similarly, what happens when technological change renders a specific easement condition obsolete? When satellite dishes for television reception were 15 or 20 feet across, easements commonly precluded them. Now that they are 1 to 2 feet across, does permitting them affect the integrity of the easement? To counteract another problem with permanent easements—the common law’s hostility to restrictions on open market in land—most states have enacted legislation that essentially “disconnects” the common-law rules and further defines state policy regarding easements (Gustanski & Squires 2000).

Conservation biologists should be concerned with the adequacy of the scientific and policy assumptions that underlie easement specifications. How is permanent protection of a resource ensured while allowing for ecological change, inclusion of new data, changes in conservation needs, and other factors that may require changes in management to best serve the intentions of the easement? For example, the volume of wood that can be harvested under the terms of an easement is often based on limited available information. Courts may be unwilling to enforce terms of an easement that, given new scientific information, are no longer valid. Or, similarly, some easements require that a specified minimum amount of herbaceous material (termed “residual dry matter”) be left behind after livestock grazing of the grasslands. In one case, maintaining a certain amount of residual dry matter is intended to allow rodent populations to thrive, providing food for

kit foxes (*Vulpes macrotis*). However, the effectiveness of this practice for the long-term survival of the kit foxes, or for management of diverse resources, is not well understood. It may not be appropriate to include such specifics in an easement as permanent practice. Instead, detailed procedures and criteria could be part of a plan that can change if more effective management techniques for kit fox conservation are found. Such a plan would have to include a process for negotiation with the landowner if changes affect the landowner's practices as agreed upon at the outset.

Finally, permanence requires capacity on the part of the land trust to maintain the records, landowner relationships, and community support necessary to monitor and enforce an easement. If the organizations are not durable, how permanent can these easements be? Institutional issues are a crucial factor in determining whether the land is in fact protected.

Land Trusts and Related Organizations

In a short period of time, a diverse and dispersed network of associated public, private, and partnered institutions has emerged, making it difficult to track their activities and their impact on the land. The land trust movement is a collection of typically nonprofit organizations operating at national, regional, and local scales. Land trusts have increased dramatically in number since 1990 (Table 1). Although we speak as if we understand them clearly, the term *land trust* has no specific meaning and the organizations are varied. The definition favored by The Land Trust Alliance (LTA) is "any organization that acts directly to conserve land." By their count, there are well over 1200 such groups. The Northeast dominates in terms of the total number of organizations, and few exist in the Southwest and south-central United States (Table 1). California has the largest land area conserved by land trusts (Table 1).

Table 1. Number of land trusts and increases in total hectares conserved by land trusts in the United States by region.*

Region	Land trusts		Average (ha)		Increase ha (%)
	1990	2000	1990	2000	
Mid-Atlantic	105	174	183,181	413,737	126
Midwest	119	186	47,450	125,128	163
Northeast	433	497	243,853	702,520	188
Northwest	50	69	75,111	274,450	265
Pacific	79	139	157,174	511,527	225
South central	11	25	2,971	42,883	1,343
Southeast	62	115	43,650	160,539	268
Southwest	26	57	16,350	285,466	1,646

*These data were collected from March to July 2001 by surveying nearly 1,700 organizations (Land Trust Alliance 2000).

Table 2. Hectares preserved by land trusts in the United States by region and type of conservation method.*

Region	Hectares owned in fee	Hectares under easement	Hectares transferred and/or conserved by other means
Mid-Atlantic	57,260	164,127	192,349
Midwest	44,169	34,172	46,788
Northeast	182,064	338,791	181,666
Northwest	9,602	207,408	57,441
Pacific	83,657	65,023	362,847
Puerto Rico	2,833	—	168
South central	7,356	21,925	13,602
Southeast	20,853	68,857	70,828
Southwest	96,987	147,675	40,804

*These data were collected from March to July 2001 by surveying nearly 1,700 organizations (Land Trust Alliance 2000).

Though a declining number of small land trusts rely exclusively on volunteers, most have some professional staff. Others are large groups with significant resources, such as The Nature Conservancy. The missions of land trusts also vary greatly: they may include protecting habitat, watersheds, historic resources, open space, working forests or farms, or a single locally cherished site. The three major tools of the land trust are the conservation easement (described above), preacquisition, and private reserves. In a preacquisition, a land trust acquires a property, then resells or otherwise transfers all or part to a public or private owner. Although preacquisitions account for 38% of all transactions by LTA members (Table 2), there has been a hostile reception to this technique by several rural communities because it can create public land that is protected from certain uses and not taxed. Finally, some land trusts own all or some of their acquisitions outright (i.e., in fee title) to manage as private reserves. In this case they must absorb all the management costs.

The LTA emphasizes that land trusts operate independently from the government. Even organizations that appear totally private, however, depend to an often unclear extent on government funding. Relief from federal, state, and local taxes facilitates transactions because the easement donors may gain a deduction off their income, inheritance, and property taxes, and even easement sales can be structured to provide tax benefits. Of course these benefits are subject to change if the laws dictating inheritance tax rates and limits are amended. Land trusts also seek funding from private foundations that receive many of the same tax benefits (Dowie 2001).

Land trusts and related institutions often use public grant programs to offset their acquisition and operational costs. They sometimes lobby public agencies and politicians for specific projects and use public funds to leverage additional support to increase their portfolios of conservation lands. Examples of U.S. federal grant programs that provide funds to acquire conservation easements include the U.S. Forest Service's Forest Legacy Program and the

U.S. Fish and Wildlife Service's National Fish and Wildlife Foundation. The latest federal "farm bill" provides a cornucopia of easement subsidies. It authorized \$50 million for easement acquisitions in 2002 and approximately doubles that amount for each of the next 5 fiscal years. These programs are targeted at conserving land-based resources and can assist both public and private institutions. The flexibility inherent in distributing these funds to public institutions and "private" land trusts makes it difficult to know whether the land being purchased is public or private and who is accountable for it.

A transaction of the Sacramento Valley Open Space Conservancy illustrates the complex funding arrangements underlying joint private and public land-conservation ventures. In an effort to raise over \$11 million to protect the natural resources on a 1644-ha ranch in East Sacramento County, California, the Conservancy has tried to obtain funding from the following sources: bond funds from Proposition 12 allocated to the County of Sacramento Parks and Recreation Commission, the California Forest Legacy, a senator-sponsored state budget request, the National Wetland and Restoration Easement, local developers, the Soderquist Fund of the Sacramento Regional Foundation, a joint grant of the U.S. Environmental Protection Agency and Trust for Public Land, a David and Lucile Packard Foundation grant, a National Fish and Wildlife Foundation grant, and other private foundations.

Many land trusts transfer land directly to the government to be managed by public agencies. Finally, a number of state and local governments operate land trusts. For example, New Jersey, Vermont, and Maryland run their own land trusts. California's Sonoma County Agricultural Preservation and Open Space District, among the most successful, is funded by a 0.25% county sales tax, resulting in approximately \$12 million a year for acquisition.

Effects of Land Trusts and Easements

To understand how this complex set of institutions and contracts has affected land conservation, we recommend that academics and practitioners consider three broad questions: (1) What is being conserved and where? (2) How do the characteristics of land trusts and the needs of landowners influence what is conserved? (3) What are the impacts on communities and the benefits to the public of land trusts over the long term? We examined these questions in the context of the available literature.

What is Being Conserved and Where?

One of the consequences of localized and therefore dispersed conservation organizations is the difficulty of gathering information. It is not currently possible to obtain adequate data on what kinds of resources are being

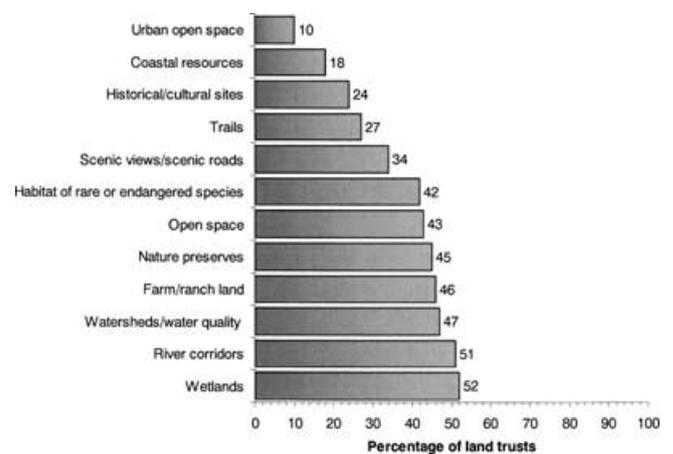


Figure 1. Percentage of land trusts primarily involved in protecting these specific types of land. These data were collected from March to July 2001 by surveying nearly 1700 organizations (Land Trust Alliance 2000).

conserved under conservation easements for large geographic areas.

Some useful data are available, much of it from land trust organizations. A survey of 900 land trusts conducted in 2000 by the Land Trust Alliance provides summary data on regional trends in broad categories of land conserved (Fig. 1). From this effort, we know that more than 2.5 million ha have been "conserved" in the United States by land trusts and that California, New York, and Montana lead the nation in the acreage conserved. The Nature Conservancy's web site features some of their projects around the world. The American Farmland Trust identifies farmland under significant threat and provides a great deal of information on how to conserve farmland, but they do not provide systematic information on their conservation easements. We found no state-level data sets that indicate in a unified format basic information about existing easements, such as location, ownership, ecological type, and proximity to and/or connectivity with other protected lands. Some incipient efforts to piece together this information for certain states (e.g., California, Oregon, Colorado, and Vermont) merit support and emulation.

The most recent book on conservation easements (Gustanski & Squires 2000) also provides little systematic data on the location and type of resources conserved, instead focusing on the legal history and use of conservation easements. This book, however, does provide some descriptive statistics on land trusts, including general information such as the percentage of land trusts that have protected various resources, such as watersheds, farmland, or historic monuments.

Even the most detailed information about where easements are located does not reveal what resources are protected and to what degree. To understand that, it is necessary to assess the terms and conditions of individual

easements and the likelihood that they will be monitored and enforced. Frequently, easements are assumed to be good for conservation because they at least abate the risks of the land being subdivided or developed to its highest economic use, and this is considered a benefit to all forever. The real story is much more likely to be that, with the conservation easement in place, where there is currently one house there will be two or three houses, with the easement protecting an unknown quantity of open space of unidentified ecological integrity for an undetermined amount of time. Case studies provide an introduction to how successful (Ohm 2000) or unsuccessful (Strong 1975; Bick 1996) easements have been in terms of conservation. The Trust for Public Land (2000) focuses on four case studies illustrating the ways in which communities are protecting water quality in four states by acquiring land and easements in threatened watersheds. There are of course other widely scattered case studies available on particular private-land conservation projects. Nevertheless, it is not presently possible to discuss how effectively resources are being protected or to compare the performance of one type of easement or institution to another.

Although the total acreage of land under easement is a good place to start, a better accounting of the resources that have been protected from development through conservation easements—information on the level of connectivity and integrity of the land being protected and the goods and services that are being provided—would greatly enhance understanding of what easements do well and poorly under which conditions.

More specifically, the following questions should be investigated: (1) Where are the properties with conservation easements and what is their relationship to other protected areas? (2) What conservation values—habitat types, agricultural soils, threatened and endangered species, viewshed—are included in the easements, in what condition are they, and how adequately are they protected? (3) How much open space is provided and what density of development can be expected? (4) What types of prescriptions are written into the conservation easements and attached management plans, what do they protect, and how will they adapt to ecological change?

Once we have these data, we can assess past trends and estimate what can be reasonably protected in the future with this tool. In an attempt to better understand to what extent conservation easements can protect biodiversity on private lands, conservation biologists should be trying to answer the following questions: (1) Based on past acquisitions, what types of land and resource values can we expect to be conserved effectively through conservation easements? (2) Under what circumstances are easements not likely to provide effective resource protection and, hence, which resources will be left unprotected? (3) Can better science improve the effectiveness of conservation easements in terms of biodiversity conservation

and, if so, where should we focus our efforts? (4) How can the monitoring and stewardship of easements be improved to ensure that conservation values are protected in perpetuity?

Monitoring is essential to assure that easements are working effectively, yet monitoring and stewardship present some of the greatest challenges to land trusts. The problem becomes even more complicated when ownership of the fee title changes over time. Depending on easement language and resources, the easement may be enforceable to varying degrees through monitoring. Unfortunately, land trusts may focus more on acquiring easements and less on stewardship.

Some conservation biologists have developed methods for prioritizing protected-area acquisition (Abbitt et al. 2000; Margules et al. 2002). In addition, public resource agencies, such as the Natural Resource Conservation Service, have developed methods to rank land parcels based on local resource evaluation and site considerations (Farmland Protection Policy Act 2000). However, to compare the properties conserved by a land trust with an idealized set of protected-area priorities based on existing resource information is not a fair way of measuring a land trust's success. This type of comparison ignores the fact that the utility of conservation easements is limited or, alternatively, enhanced by economics, landowner interest, institutional constraints, politics, and other social factors. Interdisciplinary research is needed to fully investigate the outcomes of this new conservation paradigm.

How Do the Characteristics of Land Trusts and the Needs of Landowners Influence What is Conserved?

The literature on the many institutions that are part of the land-trust movement is widely scattered. The legal literature includes significant debate about the purposes, strengths, and weaknesses of conservation easements (Korngold 1984; Cheever 1996). Conservation under the farm bill is extensively treated (Potter 1974; Hoffmann 1986; Watson 1994; Fink 1999). However, we found no analyses of land-trust efficacy, or comparisons of land trusts to government agencies. The advisory literature is extensive (Diehl & Barrett 1988; Land Trust Alliance 1990, 1993, 1996; Lind 1991; Wright 1993, 1994) but rarely provides detailed comparisons of institutional differences.

A couple of hortatory works merit mention because they provide a sense of the variety of land trusts. Endcott (1993) provides an overview of public and private partnerships with case studies of particular conservation organizations. Best and Wayburn (2001) provide a careful analysis of trends in private forests and point to the small but growing number of conservation groups, such as the Pacific Forest Trust, seeking ownership or easements on private forest lands.

Dwyer and Hodge (1996) are probably the best source of information on institutions similar to land trusts, but

they treat little-understood conservation, amenity, and recreation trusts in the United Kingdom. No comparable book attempts a similar categorization and analysis of land trusts in the United States. However, Gustanski and Squires (2000) provide an excellent overview of the treatment of land trusts and easements in different appellate districts across the country, and Fairfax and Guenzler (2001) explore institutional design issues in *Conservation Trusts*.

A number of researchers have examined farmland preservation by land trusts. A 1989 report by the California Coastal Conservancy (1989) found that land trusts were quite effective at protecting land, provided that they had financial support, a receptive agricultural community, supportive government policies, and a competent staff. The CCC found that land trusts had a number of advantages over state agencies because they had better local knowledge, could negotiate better terms, and achieve conservation goals for less cost.

Daniels (1991) argues that purchase-of-development-rights programs (similar to easements) cannot preserve the necessary critical mass of agricultural land given their inherent costs, although they do provide more long-term control than zoning or property tax breaks. Geisler (1993) notes that conservation easements might not be cost-effective in areas with the greatest development pressure. King (1988) suggests that because of the pressure of urban growth, agricultural easement programs may effectively revert to open-space easement programs, given that agricultural operations face use conflicts with urban neighbors apart from those related to development.

In sum, the institutional literature is widely scattered and provides little sense of which institutions work best in particular ecological and political settings. Due to this dearth of information, it is difficult to determine when and where land trusts are more useful in terms of land conservation than alternative institutions (Hocker 2000).

There is a clear need to describe and develop hypotheses regarding this diverse body of conservation organizations and strategies. A host of external and internal variables affect how land trusts conserve land (Table 3). It is not clear how these variables interact with one another and affect what is conserved or how it is conserved. For example, do larger land trusts use preacquisition more often than smaller ones that may not have the resources to purchase the entire property, encumber an easement, and then resell it? We also do not know why certain organizations have already folded or understand what factors are associated with organizational longevity. Similarly, we do not know how land trusts of different sizes interact with existing government and other private institutions and which characteristics of land trusts are associated with effective partnerships.

Because land trusts rely on landowners to voluntarily donate or sell full or partial interest in their land

Table 3. Examples of external and internal variables that may affect land-trust activities and accomplishments.

<i>External variables</i>	
environment	
physiography	
habitat types	
biodiversity	
threatened and endangered species	
economic	
land value and market history	
taxes	
industrial structure and capacity	
agricultural markets and products	
political/cultural	
political structures and level of participation	
availability and functioning of other conservation	
advocacy organizations	
population density	
zoning and land-use regulation	
ownership patterns, history	
distribution of parcel sizes	
land-use history and current land uses	
availability of public and private funding organizations	
prevailing views about private land, conservation,	
and environmentalism	
<i>Internal variables</i>	
mission	
membership	
assets	
funding sources	
staff	
portfolio size	
age of organization	
transaction tools	
degree of prescriptions used	
governance	
institutional partners	
monitoring/stewardship program	

for conservation purposes, it is important to understand landowner motivations for participation. The literature on why landowners participate in easement programs is scant (Elconin & Luzadis 1997; Rilla 2002; Rilla & Sokolow 2000). These studies attempt to assess landowners' experiences with conservation easements and land trusts. However, we know little about which characteristics of easements and the institutions that hold them are attractive to landowners and what motivates them to serve as stewards to the land in a way that is compatible with the conservation goals of the easement. Some land trusts were formulated specifically to create an institution with which like-minded landowners would feel comfortable working. For example, the Colorado Cattleman's Agricultural Land Trust was created by members of the Colorado Cattleman's Association "with the primary interest of landowners in mind." It is clear that most landowners prefer the least restrictive easement obtainable and the one that retains the most exclusive rights, but it is less clear which specific kinds of restrictions and degrees of restrictions are acceptable under what conditions, and at

what price. In a few cases, landowners insist on more restrictive easements in order to preserve current management practices. Although it is important to monitor and enforce the terms of the easements, it is also important to note that conservation goals cannot be met for reasonable costs without the cooperation of the landowner. Easement specifications and monitoring methods need to be compatible with the landowner's practices and should encourage his or her participation.

We also need to understand how easements fit into the complex of private and public institutions already involved in the use and management of agricultural land. For example, many ranchers are dependent on some public lands to sustain their grazing operations. Today, the future availability of that public land is often uncertain, so ranchers may be hesitant to enter any long-term land-use restrictions on their own land—even though ranchers using public lands have been shown in at least one case to be more often interested in conserving ranch land for future generations (Sulak & Huntsinger 2002). Some easements associated with the Malpai Borderlands Group are linked to continued grazing access to public lands, to protect the productive capacity of easement lands as part of ranch operations. This linkage is part of the easement stipulations from the outset and is factored into the price of the easement. In a similar fashion, local land-use planning regulations may be crucial to the landowner's decisions about whether or not to put an easement on the property, because this affects development options. Farming and ranching become more difficult when the interface with urban and suburban residents increases (Hart 1991; Huntsinger & Hopkinson 1996).

Some flexibility in easements is needed not only to adapt to new scientific findings and changing ecosystems but to assure that future landowners can adapt to changing circumstances and that these changes can be negotiated equitably between the landowner and the easement holder. The relationships between landowner goals and demographics; property characteristics; easement terms, including "perpetuity;" and the characteristics of the institutions that hold them clearly need further study so that we may gain greater understanding of who is likely to facilitate or constrain efforts to conserve biodiversity on private land.

What are the Impacts on Communities and the Benefits to the Public of Land Trusts over the Long Term?

Recent major shifts in funding mean that land conservation relies heavily on ostensibly private transactions that blend private and public funds. There is little understanding about the strings that come attached to these funds and how both the strings and competition for support affect conservation goals, organizational stability and success, and equitable access to the benefits of conserved resources. The division of actual costs among the pub-

lic, the landowner, and the nonprofit sector is difficult to sort out, which can of course be politically advantageous. Clearly, the long-term effects of private-land conservation on local communities needs further study.

Although they are often purposefully placed beyond the normal procedures of government accountability, land trusts come at some public cost (e.g., to tax revenue) and often use public funds. Public input into their activities varies in scope, intensity, and structure. What the public has acquired in exchange for the public money used and consequences for tax revenue is unknown. In his analysis of Oregon's conservation easement program, Mills (1984) noted that problems include private control, loss of local revenue, the potential for low-density development, inefficient use of open space, potential exclusionary effects, and the destruction of metropolitan vitality.

A 1999 *Wall Street Journal* editorial argued that the conservation easement is the tax loophole par excellence, "one of the most exclusive tax breaks of all time.... In short, the conservation easement gizmo uniquely satisfies not one but two compelling needs of premillennial Homo Liberalus Americanus: The need to reduce his tax burden and the need to make a show of doing something for the environment." Yet, the whole purpose of government spending is that individuals and society should benefit (Whyte 1959). Pfeffer and Lapping (1994) argue, however, that the purchase and transfer of development rights programs used in the northeastern United States may increase the disproportionate influence of the landowner class unless the decisions are made more equitably. Therefore, it may be that wealthy landowners are benefiting disproportionately from the land trust approach to conservation and that the priorities of the less endowed are not well served by private organizations enjoying government largess rather than entrusting land conservation and management to more publicly accountable government agencies.

Writing from a different perspective and using a regression model of land values on location variables, Standiford and Scott (2001) found that property values appear to increase significantly around open space in southwestern Riverside County, California. The authors concluded that this was an overall benefit to the community at large because it increased tax revenues, going against the common assumption that protected land results in a net loss of tax revenue. They also noted that previous studies had found that whether or not open space enhanced property values depended on how developed open-space recreational facilities were (Weicher & Zerbst 1973). The conclusion drawn from these results is that high levels of car and foot traffic, associated with popular parks and trails, are an unwelcome intrusion for most landowners. Significantly developed recreational facilities have a negative effect on property values, but property values of land adjacent to less-developed open space could be as much

as 23% higher than houses one block away. Others have found that property values in proximity to open space are 32% higher, that average prices per acre increase \$1200 if the land is within 1000 feet of open space, and that taxes on these kinds of property values can recoup the initial cost to the public of creating open space (Correll et al. 1978; Nelson 1985).

Studying urban greenways in Indianapolis, Lindsey et al. (2001) found that, contrary to much of the literature on equity and access to public services, minorities appear to have disproportionate access to the city's greenways. However, a recent assessment of spending of open-space bond money in Los Angeles found that those areas with much open space got more funds for future land acquisition and that those with the least did not improve their position (Wolch et al. 2002).

Social equity is essential to sustainability and should be examined in relation to private-land conservation, given the importance of these lands for conserving biodiversity. However, there are bound to be variations in outcomes with regard to access and the public benefits and costs of conserving land. Some may argue that preserving a viewshed or ecosystem goods and services such as clean air and water benefits everyone, whereas others may want access to preserved lands for recreation or other uses. Existing research does not clearly deal with whether equity refers to access to funding in a region, to open space, or to ecosystem services, for example. Also, the consequences of easements on tax revenues are not well quantified and depend on the situation and time of analysis. One question is how to approach the issue of equity in conservation. Another question is how the various public and private institutions involved in a conservation project have maintained or created public will for their goals. Clearly, the regional conservation strategies emerging from a wide variety of public and private partnerships raise questions about the distribution of benefits and costs in communities. More information should be brought to bear on this complex process.

Conclusions

The use of land trusts to conserve resources by acquiring conservation easements has created a complex conservation situation that is poorly understood and warrants further study. We do not know what to expect from the most popular type of incentive-based conservation practice—what it can protect, what it cannot, and what the long-term consequences may be. We cannot expect conservation easements to protect all the natural resources associated with private land or to provide goods and services for all people. However, given the popularity of easements and our dearth of knowledge about their effects, it is important that we gain a greater understanding of what is

being provided for whom and at what cost in order to evaluate their usefulness for biodiversity protection.

Many members of the Society for Conservation Biology have focused on the importance of participating more actively outside academia to influence habitat protection. Some have done so by providing land trusts with methods of prioritizing acquisitions, making land-management recommendations, and influencing decision-making by becoming board members. We hope this paper will stimulate conservation biologists and other interdisciplinary scientists to think critically about private-land conservation tools and the private and public institutions involved and to strengthen, monitor, and evaluate their efforts through scientific inquiry.

A long-term multidisciplinary research effort is needed to quantify the benefits and costs of incentive-based private land conservation as it is practiced, to ultimately determine to what degree conservation easements mitigate threats to biodiversity. Our challenge includes determining whether conservation easements and the organizations that develop and hold them are effective at protecting conservation values by prescribing management actions, preventing development, and restricting other types of land use. Similarly, we might ask whether our scientific understanding of ecosystems and land management is adequate to prescribe legally binding management in perpetuity—and, if not, how we can best protect biodiversity given today's private land-conservation situation? Conservation biologists need a greater understanding of what natural resources are protected by conservation easements, the landowners that donate or sell them, and the institutions that hold and enforce them, in order to make useful recommendations about conserving and enhancing biodiversity on private lands in the United States today.

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