The Efficient Land Trust: Considering Privately Accruing Non-Market Values of Conservation Easements

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Contents

I. Introduction

In the past two centuries, the dissolution of feudal land use traditions and the socioeconomic revolution of the industrialists' laissez-faire policies have enabled the maturation of a real estate markets in which land is traded in much the same way that we sell and purchase our commodities. Competitive market forces have formed a system through which land is efficiently distributed to those with the highest demand. A neoclassical economic perspective tells us that in allowing suppliers and demanders of land use rights trade freely among each other, we will see an optimal dynamic distribution of newer and highly valued land uses replacing obsolete and inferior uses. Thus, as modern societies spreads out across the globe, forests are cleared for farmland, houses are built on open fields, storefronts replace residential developments, and industrial factories populate our coastal bays and inland riverbanks.

However, as the expanding walls of our cities and industries push against the boundaries of the natural world, we humans have begun to question the true values that we place on the landscapes that define our world. Throughout history, we have seen large cities attempt to preserve the unique aspects of the natural world within their urban jungles, reserving sectors of the city for parks and open spaces. More recently, this pursuit has been largely undertaken by government agencies acting on the collective demands of their

constituents. These public services have not been the only means by which the wealth of amenities provided by nature has been conserved. Privately run organizations ranging in size from a few members to cross-country collectives have risen up in recent decades with this same goal in mind: to ensure that the non-material benefits we accrue from the natural world will be available to us for our whole lives, and those of generations to follow.

The non-profit land trust has played a crucial role in representing social interests in land conservation by purchasing and preserving properties and land-use rights across the country. Today in the United States, there are over 45 million acres that have been conserved through publicly run land conservation programs. These non-profits receive funding from private benefactors and donors as well as federal, state, and local governments in an attempt to provide society with a long-lasting stream of benefits. A rapid growth in the number and size of these private organizations speaks to the value placed on and the wealth invested in the missions held and pursuits that have been undertaken by land trusts thus far.[1]

The administrative bodies of land trusts face the difficulties of balancing a limited pool of grants and donations with the pursuit and adherence to an organization-defining mission. While many other non-profits face a similar

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[1] 1, 11, 13, 18, 29 Land Trust Aliance, "Data Tables." Last modified 2011. Accessed March 9, 2012. http://www.landtrustalliance.org/land-trusts/land-trust-census/national-land-trust-census-2010/data-tables.

difficulty, the land trust also must consider the perpetual expenses that come with maintaining conservation. The lasting integrity of the organization is necessary for the available social benefits to be fully realized. Securing funding sources by demonstrating successful conservation activities, while maintaining the qualities of existing conserved lands, puts the land trust in a very sensitive budgeting balance. For the momentum that the private land conservation movement has accumulated to continue, there must be careful considerations of the costs that arise along the way.

One of the most significant tools in the protection of natural amenities emerged with the conception of the conservation easement. With this legal tool, land trusts are able to purchase partial rights to land use, leaving the limited property in the original landowner's possession while securing a range of benefits for society to enjoy. The conservation easement gives the purchasing land trust the flexibility of designing a purchase agreement to not only accrue a great sum of benefits, but also to do so at considerably lower costs. By targeting both the benefiting demanders and the providing suppliers with these flexible purchases, the land trust can ensure that their limited funding is allocated efficiently and effectively.

Considerable work has been done in previous literature that looks at how to approach and quantify the demand for conservation, but little work has explored the supply-side motivations for conservation. The process by which the value of an easement is determined relies on property tax assessments

and comparable prices of similar land transactions.[2] In considering the range of values that are placed on properties by those who demand conservation, one can deduce that similar values may exist for the landowner who would be selling their property rights for conservation.

By looking at the tax codes for tax-deductible donations of conservation easement, we see that there is a gap between the foregone market value of an easement and the tax compensation that the landowner receives as payment.[3] Landowners are willing to accept a price that is lower than their wealth that is lost, and in doing so, donate some of their wealth for social benefit. Altruistic incentives alone do not explain this donative behavior, as a more efficient use of wealth donation would be routed through a skilled non-profit intermediary. Therefore, the landowner must place some privately accruing non-market value on having a conservation easement on their property.

When a land trust purchases a conservation easement, they must reach an agreement with the landowner over the price that will be paid in compensation. Using the values that are determined by market-based assessment will place this price too high. Because the land remains in the ownership of the seller, the private benefits of conservation will accrue directly to the landowner and externalities of the transaction will not be

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[2] Nancy A. McLaughlin, "Increasing the Tax Incentives for Conservation Easement Donations." *Ecology Law Quarterly*. 31. no. 1 (2004).

[3] Laurie Fowler, "Conservation Easements for Natural Resource Protection," *Georgia Environmental Policy Research Paper* (1994)

captured in the purchase price. The land trust must recognize their budget restrictions and try to incorporate this external benefit into the sale price. The careful incorporation of private non-market benefits that accrue to the landowner into the sale price of a conservation easement is necessary for an efficient and effective targeting and purchasing strategy for non-profit land trusts.

This paper begins with a wealth of background information that prepares the audience for analysis and discussion later in the paper. The mechanics of land amenity valuations are divided into market based values and non-market based values. Pertinent examples of each that are relevant to land conservation are provided and briefly explored. Next, the conservation easement is broken down into its legalities and economic advantages. As the dominant conservation tool used by land trusts today, it is critical to understand why the conservation easement is being used as it is. Finally, information on non-profits is presented, with the particular traits that make it an efficient vehicle for representing public demands being highlighted. The fragility of non-profits is also explored, which is necessary for understanding the cautions of land trust involvement in conservation.

Following the background is a literature review that looks at scholarly papers from the past couple decades in order to establish a perspective into the current world of conservation, and the issues that are being addressed today. In particular, literatures concerning non-profits as well as works on non-

market value calculations are reviewed in order to set up a context for the subsequent analysis and discussion.

The analysis looks at some of the critical considerations that are being made today concerning land conservation by land trusts. The discussion follows up this brief analysis with an in-depth look into the lessons that can be taken away from a careful consideration of the way in which privately accruing non-market values on the supply side affect equilibrium resource allocations. This discussion provides new insights that have been overlooked in previous literature. A conclusion wraps up the ideas that are presented through the paper, and suggests possible directions for future research in the area of land conservation, and non-profit driven conservation in particular.

II. Background

Valuation of Land Amenities: Market and Non-Market

Market Values

One of the first economic problems to be addressed by the great economic thinkers of the late 18th and 19th centuries was the proper assignment of value to the goods we trade in our marketplaces. Adam Smith first recognized the discrepancy between the fluctuating prices of goods in the market and the inherent "natural" value of a good. Many economists that followed provided further theories to explain values beyond the influences of market prices. All

these great minds recognized that the competitive marketplace was the mechanism through which monetary prices were placed on all tradable goods, and that it had its limitations in representing the true values of these commodities.

In the past century, the understanding of the true values of the land we live on has likewise gone through some changes. In the United States, a growing population and the westward expansion across undeveloped lands introduced a rapid transformation of land uses. Open fields were tilled for farmland, timber stands were harvested and milled, cities were erected about harbors, and residential neighborhoods followed closely. Today, as new technologies and population pressures change the ways in which we use land, our nation's landscape from coast to coast is a shifting patchwork of different land uses.

The modern real estate marketplace reveals the "market price" of a parcel of land by allowing the consumers to compete and bid against each other in an attempt to secure the rights to the best and highest use possible. This high bidder may be a farmer, homeowner, or businessman, but regardless of who buys it, the sale price will be determined by the aggregation of the various benefits that the landowner will receive over time from owning the land. These values can arise from a variety of different demands, but they all share the characteristics of being privately held, with benefits that accrue directly

to the landowner. We label this range of private benefits "market values" due to their inherent relationship with the competitive marketplace.

Market values are the driving force behind land use succession. Land use values are calculated as the net present value of the stream of benefits realized over time, and are often referred to as rents. The term '"market values" distinguishes those rents that are tradable in open markets and therefore subject to competitive forces. Landowners capture these rents through extractive uses such an agriculture, mining, logging, and fishing, or by developing the land for residential, commercial, or industrial use. The effective demands for the products generated by these uses shift over time, and thus the use-capacities of land likewise change over time, prompting shifts to new economically efficient uses.

With this process of transition, there arises a problem in the open real estate market. As lands are valued at their highest use, that final use dictates the way in which the land is utilized. In some cases, such as commercial development, the "continued expansion of the high-priority uses inevitably leads to a diminution of the secular supplies of land resources available for lower uses."[4] Demand for these lower uses still exist, but the nature of the competitive market pushes them out to lands of lower quality and market value to realize their benefits. A neoclassical perspective would see this as an

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[4] Raleigh Barlowe, *Land Resource Economics: The Economics of Real Estate*, (Washington D.C.: Prentice-Hall, 1978)

efficient outcome, with the highest demand capturing the supply, but this assumption relies on the ability for competitive markets to allocate resources efficiently. In the past few decades, this assumption has been challenged by the emergence of the understanding and considerations of public, socially beneficial goods.

Non-Market Goods

The neoclassical concept of the public good describes a good that once provided, is not excluded from any individual, and does not decrease in quantity with marginal use. When a good does not diminish with use, a zero marginal cost results in the lack of a market-determined price. In the absence of competition over a restricted supply, the users will not need to reveal their willingness to pay. When the use of a good cannot be excluded from individuals, there is no way to prevent use by those who did not pay for the provision. Consequently, there is no price that signals its true scarcity, and the consumer lacks market signals of social demand. This lack of information results in a failure to resources to be allocated efficiently.

In the marketplace, the private incentive to purchase a public good is very weak. The benefits generated from such a commodity accrue to a large population rather than directly to the purchaser, and the costs of provision are the burden of only the purchaser. A private cost-benefit analysis will not justify the investment in a public good, and resources will be allocated elsewhere.

Due to the fact that the individual does not have an adequate incentive to provide a public good, there can be large losses in social welfare. The wealth of benefits that come with socially beneficial goods will be foregone if the allocation of resources is left solely to private incentives. Private benefits will be maximized through competition, but forgone social benefits cannot be ignored, because a reallocation of resources might result in a higher net benefit, and thus the economic definition of efficiency is violated. This failure to optimally allocate resources results in a market failure when public goods are present.

What then are the components of the social demands that make up these benefits from public good provisions? Due to the inability for competitive marketplaces to optimally provide these amenities, we label them "non-market values". The sources of these are varied, but in this discussion we will look to those values that rely on the conservation of land. Additionally, we consider some values that are either inefficiently traded in existing marketplaces, or do not have an open market on which to trade them, and thus can be considered non-market values. It is imperative to understand the nature of these values in order to conduct a meaningful and accurate analysis of land conservation costs and benefits.

Recreation Value

The first non-market value that was seriously considered in land use policies was that of recreation. Publicly conserved lands such as National Parks and

National Forests provide the public with free access to the benefits of outdoor activities. The users reveal their preferences for recreation by spending time and money on outings to parks or on hiking trips, demonstrating a willingness to pay for the experience. An important caveat of recreation value is that the land must be open to public access for the benefits to be realized. If an individual or organization conserved a parcel of land without allowing for public access, then the potential social benefit that would arise form the land will not be accessible.

Environmental Value

The preservation of environmental integrity has in recent decades come to be a popular political debate, driven the foundation of non-profit organization around the world, and been the target of $6.6 billion dollars of donations in 2010 alone.[5] As our cities and suburbs expand out into the wilderness, we strain the ecological systems that have evolved in the plant and animal kingdoms, threatening the vitality of habitats, and thus the existence of many species. Non-market values of environmental preservation can come from the willingness to pay to see a species in person at some point in the future, as well as the benefit of simply knowing that an ecological feature is protected somewhere.

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[5] "Giving USA 2011: The Annual Report on Philanthropy ," *Center on Philanthropy at Indiana University* (2011)

The true value of environmental quality and the value of preservation is an extremely complex and commonly examined calculation[6] and is beyond the scope of this paper, but what is known for sure is that many individuals place a significant value on the quality of the environment, and demonstrate so by donating billions of dollars every year. The valuation of environmental benefits is crucial to many land conservation motives, but is nearly impossible to estimate, due to the absence of a competitive market for trading such a value, and the lack of supply side information available to those who seek to invest in it. Regardless of its complexities, environmental values are at the core of the missions of many conservations organizations, and demand careful consideration.

Scenic Value

The third of the commonly considered non-market values captured by land conservation is that of scenic amenities. Scenic views can easily be considered a public good when there is a desirable view within public access, such as

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[6] For examples, see:

Trudy Ann Cameron, "Interval Estimates of Non-Market Resource Values from Referendum Contingency Valuation Surveys," *Land Economics*, 67, no. 4 (1991)

Seong-Hoon Cho, David H. Newman, and J. M. Bowker, "Measuring rural homeowners' willingness to pay for land conservation easements ," *Forest Policy and Economics*, no. 7 (2005)

Vivek Shandas, "An Empirical Study of Streamside Landowners' Interest in Riparian Conservation," ." *Journal of the American Planning Association,* 73, no.2 (2007)

JunJie Wu, and William G Boggess, "The Optimal Allocation of Conservation Funds," *Journal of Environmental Economics and Management*, 38 (1999)

along the side of a road. The value of accessible scenery follows closely with recreational value in its connection to the history of land conservation in the United States. Many of the National Parks and National Forests today preserve some of the most remarkable natural monuments and landscapes that exist across the country, from expansive mountain ranges to barren deserts to deep canyons.

It may be argued that scenic amenities are traded actively in competitive markets, and thus do not deserve the classification as a non-market value. In residential real estate markets, views are a significant determinant in the purchasing price of a home, and competition for a good view can drive property values up considerably. However, in this discussion we consider scenic values and non-market value in land conservation due to its public good qualities. Preserving an open farm field adjacent a local highway might be valued by locals for its preservation of local character or of natural beauty. The potentially socially efficient provision of such a view would not be a consideration of the private landowner, and thus we classify scenic values as extraneous to the open marketplace.

Existence Value

The last non-market value of interest is one of the most obscure and difficult to quantify. Existence value has a few different sources, and each is worth looking at carefully. We first consider the idea of the private existence value. A private landowner might hold a non-market value on their property that

comes from a desire to preserve the current use of the land. In escaping pressures of residential and commercial real estate markets, the landowner can be sure that the current land use will be preserved in future. This is especially important in areas where urban expansion is crowding long-time agricultural communities, and the rural residents do not want the growth to change their ways of life.

Evidence of this private value can be seen anecdotally in a sample of farmers in Sonoma Country, California with conservation easements on their properties, who explain one of the main reasons of accepting a conservation easement to be the preservation of an existing way of life.[7] This sort of value would depend on a range of variable conditions, which would be difficult to evaluate by a potential purchaser, and thus fail to clear in a market.

Another component of existence value is the option value. When a private landowner considers conservation planning on his property, he or she might place value on removing the property from the open market and thus allowing for the decision on the future use of the property to be delayed for a determined amount of time.[8] Removing a property from the real estate market can act as insurance, delaying the decision to sell, so the landowner

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[7] Ellen Rilla, and Alvin D Sokolow, "California Farmers and Conservation Easements: Motivations, Experiences, and Perceptions in Three Counties," *University of California Agricultural Issues Center*, no. 4 (2000)

[8] Christopher M Anderson, and Jonathan R King, "Equilibrium Behavior in the Conservation Easement Game," *Land Economics*, 80, no. 3 (2004)

can remove themselves from a temptation to sell a property due to financial hardship or a real estate bubble. Knowing that there is a secure option to sell in an open market at some point in the future may be of value to the landowner. Considering the nature of this type of value, there does not exist an efficient market in which the securing of future options is traded. The potential designs of conservation easements might be able to actively provide these demands, but the market for conservation easements is extremely thin, if existent at all, and thus this will be considered a non-market value.

The final component of existence values is the altruistic and bequest values. When a landowner makes a decision of what price to accept for a conservation easement to be placed on his property, he might gain benefit from knowing that other individuals will benefit from his or her actions. These other beneficiaries might be the general public, in which case the landowner might gain a "warm glow" effect of simply donating towards a charitable cause, or a directly altruistic benefit of knowing he or she made specific individuals better off by accepting the easement transaction.

Additionally, there is the benefit that the landowner has of preserving the nature of the land for future generations of the family, called a bequest value. Removing the incentive of selling at a full market price by placing an easement on the property ensures that future generations will have the opportunity to experience the property in the way the landowner

experienced it.[9] Here, the private owner is assuming the preferences of his posterity, but this is irrelevant to the genuine nature of the private value. This value shares characteristics of both the other components of existence value. The determinants of altruistic and bequest values are vague, and thus the information is weak. Also, there does not exist an effective open market on which such a value can me traded competitively.

These three components together make up the obscure but real non-market value of existence. The question at this point is in how to possibly figure out a systematic consideration of these non-market values, either from the point of view of the purchaser or supplier of land conservation. Various valuation methods exist, but each comes with its shortfalls and doubts of accuracy. Such methods will be considered later in the discussion.

As is shown in the background on conservation easements, there is evidence of landowners regularly accepting compensations for land conservation on their properties that are significantly less that market-derived value of the conservation. This provides us with proof that there must be some sort of non-market element of conservation that escapes the predictions of the marketplace. Therefore it is important to consider the viability and degree of each of these non-market values in order for efficient conservation

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[9] Ellen Rilla, and Alvin D Sokolow, "California Farmers and Conservation Easements: Motivations, Experiences, and Perceptions in Three Counties," *University of California Agricultural Issues Center*, no. 4 (2000)

transactions to occur. Thus ends the exploration of land-based values, but the understanding of such concepts is critical for analysis later in the exploratory extent of this paper.

The Conservation Easement

In the wake of World War II, the United States saw a great increase in wealth, bringing with it large families and high standards of living. Governments across the country faced a demand for recreational opportunities rising from its expanding and prosperous constituencies. The need to supply the social demand had pushed many states to pass bills for the allocation of government funds for acquisitions of public lands. These purchases were made at high market-driven prices, which limited the amount of land the government was able to provide, so an alternative, more efficient method of recreation and open space provision was needed.

In 1959, William H. Whyte wrote an article called, “Securing Open Spaces for Urban America: Conservation Easements”. Within this report, Whyte outlined an alternative method by which governments across the country might be able to more efficiently provide public lands. Through identifying that many of the benefits sought after did not require a full, fee-simple purchase of the land, but rather preventative measures to protect natural landscapes from urban development, Whyte questioned some of the tactics that were being used by public conservation agencies. He identified some specific states that were using partial rights purchases rather than full out property acquisitions,

reviewed their methods, and introduced the public to the idea of the "conservation easement".

When parcels of land are sold, the transaction consists of signing over the legal rights of use of that property to the purchaser. These rights are defined in the deed of sale, and comprise the definition of property. A collection of land use rights is commonly thought of as a bundle of sticks, with each stick representing a particular land use right. When a foreign party has interest in using a part of another individual's property, they may purchase the land outright in fee-simple, or purchase only a few of the sticks from the full bundle through an easement. The easement allows the buyer and seller to negotiate a purchase agreement that meets the interests of both parties, at a lower price than that determined by the open market. Utilities, for example, often purchase easements to run a power line through a property, and neighbors will purchase as easement to route a driveway through a portion of another's property. These kinds of transactions result in both parties giving up only what they must for the purchase to be made. The significance of easements is in their flexibility and the way in which they address both the demands of the purchaser and the seller.

The conservation easement allows for more effective and efficient public land provisions by enabling the purchasing party to target and purchase the specific property rights that are necessary to achieve a desired benefit. In his article, Whyte provides a list of some of the potential conservation goals to be

made via the conservation easement. These include: prohibition of erection of buildings, restriction against construction of roads, prohibiting the removal of trees and other greenery, restriction of uses other than residential or agricultural, prohibiting the dumping of waste, and other restrictions consistent with natural amenity preservation.[10] Conservations easements today include many of these proposed restrictions, as well as some more which have proven beneficial. The restriction of development is standard in modern conservation easements, as is the modification of the landscape. Beyond this, there are specific use rights that correspond with different values, and thus the full extent of the easement depends greatly on the goal of the conserving agent.

An acquiring organization must also consider the stipulations of the conservation easement, which include limitations of public access, the length of time for which an easement is to be held on the property, and the party responsible for stewardship. The length of time that an easement is held on the property can be short-term or perpetual, depending on the conservation goals of the purchaser. Public access clauses can also vary according to the intended benefits of the conservation easement. Species protection would likely restrict public access, while recreation uses would warrant a public access clause. The landowner may also want to restrict access to public use so as to preserve the private quality of his or her property. Stewardship of an

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[10] William H. Whyte, "Conserving Open Space for Urban America: Conservation Easements," *Urban Land Institute Technical Bulletin*, 36, (1959)

easement assigns the responsibility of upholding the easement terms to a specific party, which is typically the acquiring land trust. It is up to the steward to make sure that the stipulations of the easement are being followed, and thus the accumulation of benefits relies on a responsible and consistent steward.

From 2000-2010, the acreage of conservation easements held across the United States by land trusts nearly quadrupled, from 2.4 million acres to 8.8 million acres.[11] The large popularity of conservation easement usage today demonstrates how effective this alternative approach has been. Conservation agencies and organizations of all sizes utilize this legal tool to address all kinds of demands for public goods. In the 60 years that conservation easements have been traded, there has been much evolution in the parties that seek out and acquire them, with interests in efficiency and equity motivating a maturation of the utilization of this new conservationist's tool.

The Non-Profit Land Trust

When the adoption of conservation easements as a method of answering public demands for natural amenities took hold in the 1950's, it was predominantly government agencies that were undertaking the task. Today the scene looks significantly different, with public and private sectors both

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[11] Land Trust Alliance, "Data Tables." Last modified 2011. Accessed March 9, 2012. http://www.landtrustalliance.org/land-trusts/land-trust-census/national-land-trust-census-2010/data-tables.

working to meet demands for conservation. Private conservation organizations in the United States has existed for over a century, dating to the late 19th century, when wealthy families established foundations to create parks in urban areas devoid of nature's presence. Since that time, the development of the private non-profit sector has encouraged the founding of conservation organizations across the country.

These non-profit land conservation organizations are known as land trusts, and the success and growth of the land conservation sector has been dramatic over the past 60 years. In 1950, there were 50 land trusts in the United States.[12] By the year 2000 that count was up to 1,250, and today, there are over 1,700 land trusts operating in the United States.[13] These statistics tell us an objective story about the growth of this sector, demonstrating that there has been a growing demand for the services that land trusts provide, and thus that there has been a consistently increasing supply for these services. The basis for this growth lies in an analysis of how the structures of these non-profit conservation organizations and the conservation easement tax laws have created an efficient vehicle for responding to public demands.

The primary support for the role of non-profit organizations in the conservation arena comes from the consumers of conservation. Land trusts

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[12] Mike McQueen, and Ed McMahon. *Land Conservation Financing*. (Washington D.C.: Island Press, 2003)

[13] Land Trust Alliance, "Data Tables." Last modified 2011. Accessed March 9, 2012. http://www.landtrustalliance.org/land-trusts/land-trust-census/national-land-trust-census-2010/data-tables.

play a role that is well known to the non-profit sector, an alternative to public agencies for the provision of public goods. The notion of a public good describes a good, which once acquired, cannot be excluded from any other individual, and does not diminish in value when used. These goods often come at prohibitively large costs to the provider, with little room for compensation from the public user. Therefore, a competitive open market does very little to provide society with these public goods, as it is up to a single purchaser to be willing to invest the money necessary to acquire such a good. Government agencies act to provide necessary public goods where competitive markets fail to do so, using the revenue from taxation to aggregate small investments by every tax-paying individual into large collective investments towards these socially beneficial acquisitions. Hence, post-WWII government purchases of land for recreation and open space met the increased demand brought on by a young, growing, wealthy populace.

However, the provision of public goods by government agencies has its shortcomings. As a publicly serving democratic body, the government must follow a particular course of action in any circumstance, decided by the majority sentiment of the voters. This generates inequitable outcomes, with one decision being made for all the constituents, regardless of their individual opinions. Inevitably, a minority voter group will be disappointed with the policies undertaken using their tax money. Conversely, in his analysis of the non-profit sector, Weisbrod tells us of how, “in a democratic society in which the governments tend to be responsive to the majority wants, there is a need

for institutions that can respond to the demands of persons who feel intensely about particular collective-type activities,"[14] such as the conservation of land. The non-profit organization provides a vehicle for these minority sentiments to be realized.

This effective substitution of non-profits for government agencies has helped to erode the problems of inequity and under-provision that arise from the binary nature of policy decisions. Additionally, the individuals who might realize more utility from funding conservation are also able to donate more money to the cause, and potentially maximize the utility they receive from such an action, whereas a taxation and policy route would limit their investment capabilities. Donors with altruistic motives benefit from the ability to provide a greater quantity of public goods than is possible through government action.

Another critical element in explaining the success of non-profits in providing conservation is in the localization of these organizations. This factor has two aspects that deserve recognition. First, from the demand side, it is more rewarding for an individual to donate money towards a conservation cause that will be undertaken closer to home. The donor will have easier access to the amenities protected by the conservation, and thus will receive higher utility from their investments. Many of the benefits from conservation

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[14] Burton A. Weisbrod, *The Nonprofit Economy*, (Boston, MA.: Harvard University Press, 1991), p 6

diminish as the distance from the beneficiary increases, and thus smaller, local organizations will provide the most possible benefit to the consumer.

The second advantage of smaller, localized non-profits is in the greater efficiency of resource allocation. The information that goes into conservation decisions incorporates many layers of data that determine the various costs and benefits of land protection. The non-profit is able to specialize in a particular geographical area or with a particular conservation mission, and gather more accurate data on the most efficient use of available funds by targeting the most cost-efficient projects. Localization of conservation organizations thus not only allows the donor to secure the highest possible return on their donations, but also allows for the organization to most efficiently allocate their funds.

Further, considering transactions costs, it is seen that there is "often a preference for some nongovernmental mechanism to deliver services and respond to public needs because of the cumbersomeness, unresponsiveness, and bureaucratization that often accompanies government action."[15] Non-profits provide a more direct route for donations to return a collective good to the donors.

The structure of the non-profit organization has been very effective in providing the public good of land conservation through land trusts, but this is

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[15] Lester Salamon, *America's Nonprofit Sector: A Primer*, (Foundation Center, 1999), p 13

not the only factor that provides it with an effective edge over government. In 1980, the IRS added section 170(h) to the tax code, which allows for income tax deductions for donations of full or partial property interests for the purpose of conservation. Through code 170(h)(3)(B), these donations can be made to qualified non-profit organizations, which allows the land trust to not only purchase lands using donated money, but accept donated lands or easements from landowners.[16] The landowners receive tax breaks that are determined by the value of the property rights donated.[17]

While government agencies are able to accept these donations, the non-profit has the advantage of being a trustworthy recipient. That is, a donor believes that the non-profit is a better and more reliable representative of their donative interests, and will not abuse or neglect their contributions.[18] The localized nature of land conservation enhances the effect of the trustworthiness of the land trust, in that local donors will be more trusting with the treatment of their donated lands if an organization run by other locals is responsible for the stewardship of the conservation. The effect of this trustworthiness is significant for many different types of non-profits, and the

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[16] I.R.C. § 170(h)

[17] Daniel C. Stockford, "Property Tax Assessment of Conservation Easements," *Boston College Environmental Affairs Law Review*, 17 (1990)

[18] Peter Frumkin, *On Being Nonprofit: A Conceptual and Policy Primer*, (Boston, MA.: Harvard University Press, 2002) p. 67

land trust has an advantage over government agencies as donative vehicles for this reason.

The increase in demand for conservation that followed WWII provided a large pool of potential funding donations, and new non-profits entered the market to provide for the demand unmet by government agencies.[19] The non-profit land trust community has grown significantly over the past 60 years, with over 400 new organizations in the 2000's alone, and still more emerging today.[20] Some government conservation agencies have been substituted over time for the more efficient and effective non-profit in the provision of land conservation, though it is still important to note that governments invest billions of dollars annually towards conservation by providing grant funding for non-profits.[21] However, the expansion of federally protected lands has slowed considerably, and will likely continue to due so, as land trusts pick up the task of conservation.[22] The government's recognition of the effectiveness and efficiency of non-profits in the conservation is not without basis. As we have seen, non-profits are able to respond to heterogeneous demands, allow

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[19] Mike McQueen, and Ed McMahon, *Land Conservation Financing*, (Washington D.C.: Island Press, 2003) p 13

[20] Land Trust Alliance, "Data Tables." Last modified 2011. Accessed March 9, 2012. http://www.landtrustalliance.org/land-trusts/land-trust-census/national-land-trust-census-2010/data-tables.

[21] Mike McQueen, and Ed McMahon, *Land Conservation Financing*, (Washington D.C.: Island Press, 2003) p 13

[22] Heidi J. Albers, and Amy W. Ando, "Could State-Level Variation in the Number of Land Trusts Make Economic Sense?," *Land Economics*, 79, no. 3 (2003)

altruists to realize greater benefits through donation, localize for better demand provision and resource allocation, respond faster to demanders and incur lower transactions costs, act as an optimal vehicle for direct property interest donations, and insure trustworthy representation of their supporters. It is no wonder that land trusts have been organizing across the country to provide the people with the natural amenities they so desire.

III. Reviewed Literature

Scholarly work in the conservation discipline is rich with a variety of approaches and a variety of conclusions. Economists, sociologists, lawyers, and ecologists have all contributed critical approaches, each with a specialized insight into the complexities that surround conservation easements. The relatively short history of the conservation easement has left considerable room for improvement, and this is the target of much of the literature on the topic. Two approaches that are particularly relevant to this discussion concern the non-profit organization's role in providing efficient conservation, and the proper incorporation of non-market values into equilibrium purchasing prices, and to these subjects we now turn.

Non-Profits in Literature

A diversity of scholarly work on the non-profit organization's involvement with conservation provides some important considerations. There are two

main approaches to this discussion. First, we look at the cautions that are raised over the role of non-profit organizations in land conservation.

One of the most significant components of the non-profit conservation organization is its autonomous nature. This gives rise to considerations of funding, inter-organization coordination, and equitable decision-making practices. We first consider the tension of meeting a double bottom-line.

The structure of the non-profit makes it the product of the collective demands of those who fund its operation. The defining limitation of the non-profit to operate with no annual profit creates a strict bottom line that the organization must heed. Additionally, the declared mission of a non-profit signals its role to the public, and is crucial to the development of a niche among organizations, and thus a successful long-term organization. These two conditions generate the double bottom-line that all non-profits face.

There thus exists a challenge for the non-profit in balancing between undertaking conservation that signals productivity, and fulfilling a declared conservation mission. Conditions exist under which a concentration in either one direction or the other, or a mix of the two, is most efficient, but this determination is complex and the metrics required for the analysis are incomplete.[23] If a non-profit pursues its mission as a driving motive, it may end up losing some of its funders due to the neglect of the funder's specific

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[23] Dennis R Young, Jung Taehyn, "Mission-Market Tensions and Nonprofit Pricing," *Andrew Young School of Policy Studies Research Paper Series*, (2008)

demands. The non-profit acts as an intermediary organization to route social demands from private donors or public grantors, and if it cannot do so efficiently, the demanders will find another use for their money.

On the other hand, following a specific mission statement can lead to more efficient allocations of available funding due to the economic advantages of specialization. The valuation of the benefits of conservation is very complicated, and assessing the complete value of conservation would require a prohibitively complex process involving scientists, economists, and assessors. Instead, it may be in the best interest of the land trust to concentrate on one particular conservation target, for example public recreation access, species preservation, or scenic provision. Specializing with a narrow conservation goal develops more accurate benefit evaluations as well as better searching methods, which would lead to a more effective individual organization. Also, expertise in an area would avoid the creation of burdensome management structures. A higher degree of specialization would lead to a greater number of niche land trusts, which would capture more of the social demand by allowing for more targeted donation, capturing the full willingness to pay of an individual.[24]

Specialization does not guarantee an optimal level of conservation, though. When the benefits of conservation depend on the cumulative level of

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[24] Heidi J. Albers, and Amy W. Ando, "Could State-Level Variation in the Number of Land Trusts Make Economic Sense?," *Land Economics*, 79, no. 3 (2003)

conservation as well as the adjacencies of conservation, such as is the case with species preservation,[25] there are efficiencies that accrue from the communication between land trusts. Coordinating conservation efforts here would lead to the accumulation of externality effects that would increase the social benefits of acquisitions for all the organizations involved. In a region where the demand for land protection is a demand for benefits that generate externality effects, the efficient number of land trusts in a region would decrease so as to reduce to costs of communication, and pool funding for larger-scale projects that could capture marginally optimal levels of benefit.[26]

This consideration of targeting coordination touches on the debate over equitable decision-making, which is a topic of close scrutiny for many scholarly works. The critical characteristic of land trust conservation that gives rise to these criticisms is the autonomous nature of the non-profit organization. The private nature of land trusts directs them to undertake conservation that heeds market signals. Opportunistic conservation decisions may be made, driven by the private incentives of the organization.[27] There are possibilities for the misdirected use of funds, where donors do not realize the expected private benefits of charitable donations because the decision on

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[25] JunJie Wu, and William G Boggess, "The Optimal Allocation of Conservation Funds," *Journal of Environmental Economics and Management*, 38 (1999)

[26] Heidi J. Albers, and Amy W. Ando, "Could State-Level Variation in the Number of Land Trusts Make Economic Sense?," *Land Economics*, 79, no. 3 (2003)

[27] Gerald Korngold, "Solving the Contentious Issues of Private Conservation Easements," *Utah Law Review*, no. 4 (2007)

how to allocate their resources is not within their hands. The land trust here runs the risk of losing funding, but this might not be a strong enough incentive to prevent inequitable allocations.

Private organizations are not bound by public sentiments in the way that government agencies are, so efforts will be undertaken that are opposed by the majority, but funded by the minority, and so are conducted anyways. A clear example of this problem is the effect of conservation on local tax rates. The taxable value of a property drops when an easement is enacted up it, and thus the local government loses a proportional amount of revenue. The locality must make up for this loss by cutting expenses in other public departments to compensate.[28]

Another side of this problem is the external effect of conservation on nearby properties. An adjacent parcel might see a rise in market value due to the existence of conserved scenic and environmental amenities close by. This rise in value will increase the property tax payments, which may not reflect the willingness to pay of the landowner for nearby conservation. This rise of property taxes due to the positive externalities of conservation can potentially neutralize the losses of tax revenue from a conservation easement,

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[28] Gerald Korngold, "Solving the Contentious Issues of Private Conservation Easements," *Utah Law Review*, no. 4 (2007)

but it can take years for this effect to normalize.[29] Regardless, the inequitable outcomes of the private nature of conservation decision-making has received criticism, with an accompanying call for a more active public approval process to ensure that inequitable outcomes are avoided.

The difficulties of conducting efficient conservation decision-making are not limited to the nature of the non-profit conservation vehicle. Another major source of inefficiencies is in the complex process of easement valuation. The lack of competitive markets for conservation easements means that the supply and demand are unable to reveal an efficient price for conservation through competitive trading. Therefore, there must be alternative methods to putting a value on the benefit of conservation as well as the foregone benefits that arise through conservation, which compose the cost of an easement. First we look at some of the literature that addresses the benefit valuation process, investigating where there is room for improvement, and how this may occur.

Values in Literature

Before any consideration of theoretical sources of benefits, we should briefly look at some empirical evidence of social willingness to pay for conservation. A sample of North Carolina homeowners responded to a survey that attempted to evaluate the aggregate willingness to pay for conservation in a

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[29] Christopher M Anderson, and Jonathan R King, "Marginal Property Tax Effects of Conservation Easements: A Vermont Case Study ," *American Journal of Agricultural Economics*, 86, no. 4 (2004)

certain county, and responses indicated that there was a demand for around 150 acres of conservation each year.[30] The billions of dollars donated towards environmental preservation in past years shows that this willingness to pay is held by a large population across the country.[31] Land trusts operating in every state demonstrate private and public interests in conservation in almost every corner of the United States.[32] It is impossible to refute the evidence of social willingness to pay for conservation, but this does nothing in determining the values that arise from the conservation of a specific parcel.

Market-based valuations are well-functioning operations in the real estate sector. A rich database of property transactions allows an assessor to extrapolate the willingness to pay for different market-based values.[33] Also, by taking the approach that potential property buyers might, one can evaluate the expected present value of a stream of rents that would be accrued by harvesting available resources.[34] Either way, the prices are

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[30] Seong-Hoon Cho, David H. Newman, and J. M. Bowker, "Measuring rural homeowners' willingness to pay for land conservation easements ," *Forest Policy and Economics*, no. 7 (2005)

[31] "Giving USA 2011: The Annual Report on Philanthropy ," *Center on Philanthropy at Indiana University* (2011)

[32] Land Trust Alliance, "Data Tables." Last modified 2011. Accessed March 9, 2012. http://www.landtrustalliance.org/land-trusts/land-trust-census/national-land-trust-census-2010/data-tables.

[33] Daniel C. Stockford, "Property Tax Assessment of Conservation Easements," *Boston College Environmental Affairs Law Review*, 17 (1990)

[34] Raleigh Barlowe, *Land Resource Economics: The Economics of Real Estate*, (Washington D.C.: Prentice-Hall, 1978)

determined via open competitive markets, and thus the valuations are accurate to the true scarcity of the resource.

The valuation of non-market benefits is a completely different story, though. In the absence of competitive markets, there are no equilibrium prices to use, and so the evaluator must discover a price by other means. There are multiple techniques used by economists to discover non-market values, with comparative strengths and weaknesses. Sending surveys out to a random sample of residents in a region that directly ask for the willingness to pay for various amenities can provide some insights into the relative values held in an area, but as far as the accuracy of the nominal willingness to pay, the survey is not very strong. There may be incentives for the respondents to overstate their willingness to pay for a hypothetical situation in an attempt to signal greater social benefit. Collecting data on the travel costs individuals invest in order to experience an amenity of conservation can provide some additional insight into their willingness to pay for the experience. Contingency valuation surveys elicit willingness to pay through evaluating threshold levels, establishing a sort of hypothetical auction.[35] These are commonly used methods by non-profits as well as public agencies in

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[35] Raleigh Barlowe, *Land Resource Economics: The Economics of Real Estate*, (Washington D.C.: Prentice-Hall, 1978)

Trudy Ann Cameron, "Interval Estimates of Non-Market Resource Values from Referendum Contingency Valuation Surveys," *Land Economics*, 67, no. 4 (1991)

justifying expenses on public goods, but they do not address the full range of non-market benefits that accrue from conservation.

The main complications in the estimation of non-market values that arise from conservation are in the estimation of the benefit of a particular project. This information is necessary for land trusts in order to analyze the optimal allocation of funds by targeting projects with high rates of return. Environmental benefits are one of the most complicated and most critically investigated sources of non-market values. A baseline willingness to pay for environmental benefits must first be determined, and then the quantity of environmental amenities that are generated from the conservation is calculated.

When considering the preservation of a species, adjacent land uses must be considered, as cumulative effects will rise when conserved parcels are next to or close to each other.[36] There will be decreasing marginal social benefits to species protection, though there may at the same time be increasing marginal effects of conservation. In evaluating the worth of preserving atmospheric and hydrologic quality, it is difficult to estimate how the benefits will accrue in the long run due to and uncertainty of the long-term effects of environmental quality. The lesson here is that there is a significant degree of uncertainty in predicting the benefits of conservation. It may not crucial to

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[36] JunJie Wu, and William G Boggess, "The Optimal Allocation of Conservation Funds," *Journal of Environmental Economics and Management*, 38 (1999)

discover a precise benefit, however, since a large enough estimate could be justification enough to undertake conservation. Therefore the difficulties that arise here can potentially be of negligible concern, though it is very important to avoid overvaluation, which would lead to inefficient resource allocation.

The demand-side valuation of the benefits of conservation easement has been the target of a great amount of discussion and investigation. Where there lacks complete analysis is in the evaluations of the true costs of conservation for the landowner.[37] This information is crucial for the non-profit conservation organization, because variations between the market-revealed willingness to accept of payments for conservation easements and the true willingness to accept can result in the misallocation of resources, inefficient payments, and a failure to calculate accurate cost-benefit rates. When a land trust has a pool of potential projects to select from, accurate information on the costs of undertaking conservation is necessary. Additionally, complete information on both the supply and demand sides would be necessary for an efficient marketplace. The absence of such information is one of the main reasons no such markets exist today.[38]

When a landowner is faced with the decision of whether or not at accept a conservation easement on their land, they weigh the costs and benefits of the

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[37] Dana L Hoag et al., "Evolving Conservation Easement Markets in the West ," *Western Economics Forum*, no. Spring (2005)

[38] Dana L Hoag et al., "Evolving Conservation Easement Markets in the West ," *Western Economics Forum*, no. Spring (2005)

acquisition based on their own private incentives, and do not typically heed the social incentives for conservation.[39] Studies have found that the design features of the conservation easement that are of most significance to the landowner concern the terms of access and the duration of the easement. The landowner is always going to be sensitive to the monetary compensation for the easement relative to the encumbrance introduced by it.[40] In seeking out a viable conservation easement, the land trusts needs to not only look at the potential benefits of protecting lands, but also the costs of doing so.

The compensation paid to a landowner by the easement acquiring organization has traditionally be calculated as the loss in market value that comes from the restrictions of the easement.[41] This is an effective starting point for purchase negotiations, as it accurately recognizes the prices of conservation determined by the competitive real estate market, but it does not represent the true value of the easement to the landowner. Many of the non-market values that arise from conservation easements accrue to the society at large. Thus, the landowner, who may hold some of these values but

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[39] Christopher M Anderson, and Jonathan R King, "Equilibrium Behavior in the Conservation Easement Game," *Land Economics*, 80, no. 3 (2004)

[40] Ellen Rilla, and Alvin D Sokolow, "California Farmers and Conservation Easements: Motivations, Experiences, and Perceptions in Three Counties," *University of California Agricultural Issues Center*, no. 4 (2000)

Jeff Pidot, "Reinventing Conservation Easements: A Critical Examination and Ideas for Reform," *Lincoln Institute of Land Policy* (2005)

[41] Daniel C. Stockford, "Property Tax Assessment of Conservation Easements," *Boston College Environmental Affairs Law Review*, 17 (1990)

does not have a competitive incentive to reveal them, also receives this benefit. If competitive marketplace were active for conservation easements, the landowner would be forced to reveal his willingness to accept in order to maximize his benefits. The complete lack of such a functioning market leads to these private benefits from conservation being hidden to the land trust, which generates inefficient easement purchases.[42]

Studies into the private benefits of conservation have revealed that they do in fact exist, but they are also very heterogeneous in their distribution among landowners.[43] It would be difficult to try and predict landowner's non-market values through a regression model, because each easement is so specific in its necessary designs, and the responses of the landowners could be unexpected. A consideration of these benefits must be made in the decision-making process, because it will affect the efficient outcome of demand and supply interactions. Some authors have argued that a proper way to incorporate these private values into a purchase consideration is to add them to the social benefit curve, justifying a greater acreage and willingness to pay for the

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[42] Catherine M. Keske et al., "Internalizing Externalities When There Are Significant Private Non-Market Rents," *American Agricultural Economics Association Selected Paper*, (2007)

Dana L Hoag et al., "Evolving Conservation Easement Markets in the West ," *Western Economics Forum*, no. Spring (2005)

[43] Ellen Rilla, and Alvin D Sokolow, "California Farmers and Conservation Easements: Motivations, Experiences, and Perceptions in Three Counties," *University of California Agricultural Issues Center*, no. 4 (2000)

Vivek Shandas, "An Empirical Study of Streamside Landowners' Interest in Riparian Conservation," ." *Journal of the American Planning Association,* 73, no.2 (2007)

land.[44] While this perspective touches on the importance of the inclusion of landowner's willingness to pay for conservation, it does not do so accurately, an issue to which I visit later, and which is of primary interest to this work. First, we must look at the aspects of the non-profit that make it so necessary for them to take a careful approach to conservation.

IV. Analysis

As the number of land trusts operating in the United States rapidly grows, the scrutiny under which they have been viewed has likewise increased. Arguments can easily be made for the accumulation of social benefits that has occurred due to the use of conservation easements, but it is important to not let this blind our critical views of the land conservation process. We must look carefully at the characteristics of long-run conservation, effective targeting strategies, and proper consideration of private landowner benefits in order to strengthen the system by which conservation takes place today.

Perpetual Stewardship

It is necessary to carefully approach the enactment of conservation easements due to the potentially fragile nature of their stewards. The non-profit conservation agency faces long-run difficulties as it continues to add

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[44] Catherine M. Keske et al., "Internalizing Externalities When There Are Significant Private Non-Market Rents," *American Agricultural Economics Association Selected Paper*, (2007)

protected lands to its stewardship list. The problems here arise primarily from the perpetual nature of the conservation easement, but also from the organizational structure of the non-profit.

For some of the values that arise from land use, there exist perpetual streams of benefits to be realized from their conservation. Many of the natural amenities protected by conservation easements come from renewable resources such as environmental integrity. When these values are the driving factor behind the acquisition of an easement, it is in the interest of the land trust to write a perpetuity clause into the easement to ensure that the values will be protected indefinitely. Doing so, however, means that the land trust is taking on a recurring variable cost of conservation along with the fixed cost of the compensation payment. Resources must be spent in the future for stewardship costs in order to preserve the benefits of the conservation easement. When considering a limited annual budget, the more easements the conservation organization holds, the more expenses must be set aside for regular easement maintenance and landowner compliance monitoring. This budgeting balance can be difficult for the land trust in the long run, as it must either continue to expand in order to continue acquiring new conservation, or it must abandon the least effective easements. If a non-profit were to take the last strategy, there would be an erosion of the integrity of such conservation actions, so grantor and donor funding would fall, and instead would be routed to organizations that will better manage their investments.

Since it is in the interest of the conservation agency to pursue further conservation, what then, might they do about this stewardship expense? A potential solution is to diversify land trusts not by their targeting missions, but rather into acquiring organizations and stewardship organizations. Doing so would clear up the financial issues of balancing the two, and the specialization would also divide up the funding sources into those interested in the maintenance of conservation and those interested in the pursuit of further protection. A specialization of labor skills in these two types of land trusts would help to improve the efficiency of operations and management, promising a more effective long-term organization.[45]

Targeting Strategies

One of the most significant advantages that the non-profit land trust has over public conservation agencies is in the economies of heterogeneity and small-scale organizations. As considered earlier in the paper, specialization among land trusts can lead to more efficient targeting of specific benefits. Expertise in not only a specific conservation goal, but also in a local area, will lead to more effective searching for viable projects. When an organization is small and closely involved in a local social region, the economic benefits are not only in the ability to better search and discover potential social benefits, but also in the network effects of being a member of a community.

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[45] Gerald Korngold, "Solving the Contentious Issues of Private Conservation Easements," *Utah Law Review*, no. 4 (2007)

Individuals who are socially connected to a local conservation agency might be more willing to donate directly to the organization, as they will receive more private benefit from their donation than if it was allocated on conservation efforts far away via a larger land trust or a government agency. A reduced travel cost for recreation or scenic enjoyment will increase the benefits for the donor, justifying a greater donation. Also, the network effects of local conservation would provide stronger altruistic incentives for the donor as well as the easement selling landowner, as they can witness the benefit of their actions accrue by others more directly.

Allowing a land trust to specialize and localize would result in the properties with the highest marginal social benefits being protected, though these benefits would be limited to the field and region of specialization, and the marginal benefits of other social values of conservation will be ignored. Thus, in the pursuit of maximizing specific benefits, there could be a loss in the net benefit of social values. In order to maintain the economies of specialization, while avoiding the diseconomies of these self-imposed limitations, there must be some sort of secondary land trust that is able to handle the data that is generated by the primary rent-seeking organizations. Doing so will allow the benefits of specialization to be realized by all the non-profits, and the collective improvement in efficiency might justify the foundation of this intermediary land trust. Targeting strategies would be improved, as land trusts could share data on areas of interest for their various conservation

goals, resulting in more successful targeting of regions with overlapping interest, leading to higher net social benefits.[46]

In the absence of active non-market value trading, it is difficult to evaluate where and for how much values will be held by society. Eroding this difficulty is a feat that would best be undertaken by land trusts. The methods of evaluating the non-market values require careful considerations of the particular benefits in order to most accurately elicit the willingness to pay of the public. By using careful hedonic pricing techniques or contingency valuations, it may be possible to gather information on an estimation of the true social benefits of conservation. Pooling this carefully collected data together via an intermediary land trust would prevent losses of potential social benefit that come from specialization, and would reduce search costs for the primary land trusts.

Non-Market Values Accruing to a Landowner

As previously mentioned, there is a relative lack in the scholarly literature that considers the private benefit of conservation that accrues to the landowner. In a competitive real estate market, an individual will be pushed to reveal their willingness to accept for a purchase price, otherwise they will miss out on the financial benefits of trade. In the absence of a market for

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[46] David A. Newburn, Peter Berck, and Adina M. Merenlender, "Habitat and Open Space at Risk of Land-Use Conversion: Targeting Strategies for Land Conservation," *American Journal of Agricultural Economics*, 88, no. 1 (2006)

conservation easements, this incentive does not exist. It is difficult to discover the true willingness to accept a conservation easement because of the non-market quality of many of these values.

Conservation that takes place in rural settings often coincides with agricultural land use. Farming landowners are approached by land trusts due to the large tracts of land they own, and the smaller marginal costs of land use conversion due to a greater distant from other market pressures such as development. Furthermore, farmers can realize a benefit from conservation through the private accumulation of non-market values. The landowner considers recreation and scenic values when he evaluates competitive market transactions, as these provide benefits that the landowner can realize easily. Placing a willingness to pay on these values would raise the willingness to accept price for full-market sales beyond equilibrium competitive pricing. When a conservation easement is proposed, the preservation of these amenities for the landowner will result in the continued private accumulation. There are also private non-market benefits that arise with the use of conservation easements, coming from environmental values as well as from the various existence values.

The private existence values that accrue from conservation depend on a range of variable attributes of the landowner, such as current land usage, historical connections with the land and local heritage, and interests in future generations. Many farmers, for example, consider the prospect of preserving

their land use patterns for coming generations to be a private benefit.[47] Altruistic incentives are similarly difficult to gauge, though some inference of expected regional levels can be extracted from donative behaviors. Rather than routing a donation through a non-profit, a private landowner could benefit from altruistic behavior by accepting an adjusted compensation price from the land trust. The existence of this range of privately accruing non-market values demands a careful approach when considering how to include them in land trust targeting strategies.

Literature on this task has called for the inclusion of private landowner benefits of conservation to be aggregated into the social benefit function.[48] Doing so justifies a higher willingness to pay by the land trust for conservation on a particular parcel. The quantity of efficient acreage protected will also increase, returning a greater net benefit of conservation. This approach is faulty in that it incorporates the private landowner benefits in the demand function rather than the supply function. Since the encumbered property stays in the hands of the landowner, he or she is the agent that determines the supply's willingness to accept an easement. If the approach of market valuation is the only consideration of the supply price, the non-market values of conservation are ignored, and the purchase price

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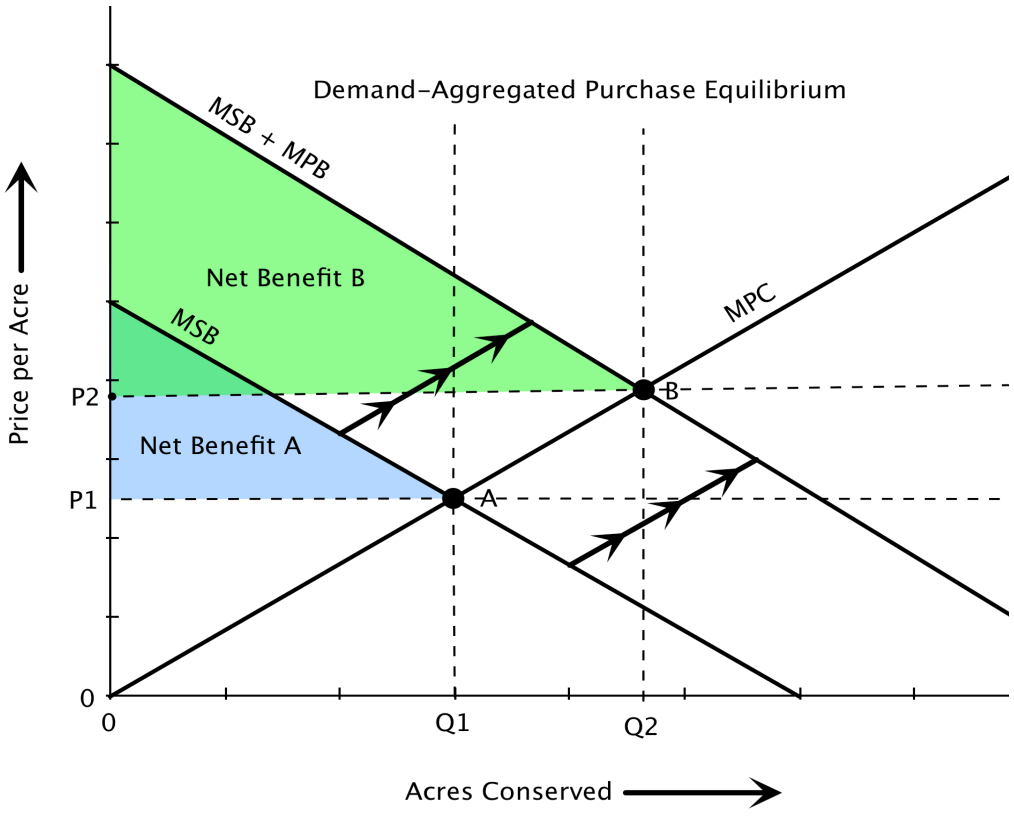
[47] Ellen Rilla, and Alvin D Sokolow, "California Farmers and Conservation Easements: Motivations, Experiences, and Perceptions in Three Counties," *University of California Agricultural Issues Center*, no. 4 (2000)

[48] Catherine M. Keske et al., "Internalizing Externalities When There Are Significant Private Non-Market Rents," *American Agricultural Economics Association Selected Paper*, (2007)

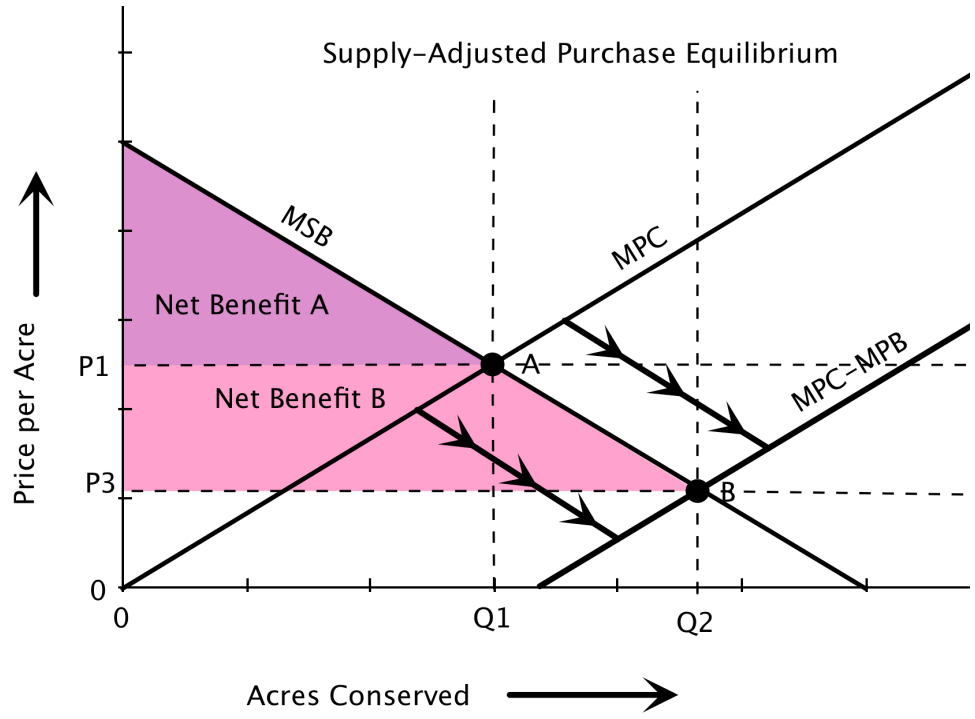
will be inefficiently high. I argue that the consideration of supply side benefits of conservation must be done so on the supply side rather than the demand. Comparing the two incorporation techniques, we see that the supply side inclusion results in the same amount of acreage as the demand side aggregation, but does so at a cost *lower* than the market-determined price rather than higher.

We look at diagrammatical representations of these two different approaches in order to compare the statics visually. Using the supply and demand model to do so allows us to conceptualize different degrees of adjustment, by shifting the relevant curves more or less depending on the affective degree of the private benefits and social benefits.



In this demand-aggregated easement purchase, the inclusion of the marginal private benefit (MPB) to the marginal social benefit (MSB) pushes the demand out out, moving the equilibrium purchase from point A (Q1, P1) , along the market supply curve to point B (Q2, P2), to a purchase cost of Q2*P2, with a net benefit shown by the triangle labeled Net Benefit B. This demonstrates that incorporating the landowner's private benefit of land conservation increases the net benefits of the conservation, though at an increase of cost of Q1*P1 to Q2*P2.

The approach of demand-aggregation, however, does not represent an effective consideration of private non-market benefits. If, on the other hand, the landowner's private benefits of conservation, MPB, were subtracted from the marginal private cost, a similar increase in acreage conserved would result, but at a lower cost per acre, and at a higher net social benefit to total cost ratio.



It is clear by looking at this diagram that a supply-adjusted, rather than a demand-aggregated, approach to including private landowner benefits of conservation in the equilibrium price will yield more efficient outcomes. Comparing to the demand-aggregated approach, the acreage of conservation stays the same, but the equilibrium price of conservation drops rather than rising. Thus, we realize the same net benefit as before, shown by the triangle Net Benefit B, but at a lower total cost, Q2*P3, since P3<P2. Thus the cost-benefit analysis of such a purchase will be much higher under the supply-adjusted consideration.

The principle here provides strong incentive for the non-profit organization to approach private landowner benefits of conservation carefully. This proposed approach actively considers both the demand for and the supply of land

conservation, taking into account non-market values that would be traded inefficiently on an open competitive market. For the land trust, such a consideration would be necessary for efficient purchases to be made. The justification for accepting a higher purchase price as proposed in the demand-aggregated model will waste the limited resources of the land trust, and lead to an inefficient aggregate sum of social benefits across all the protected parcels, since there will necessarily be fewer in existence. Targeting strategies that consider cost as one of the primary criteria can result in the neglect of other, more important aspects of a purchase, but the complete disregard of costs in the searching and targeting phases of conservation will result in the inefficient allocation of conservation resources.

V. Discussion

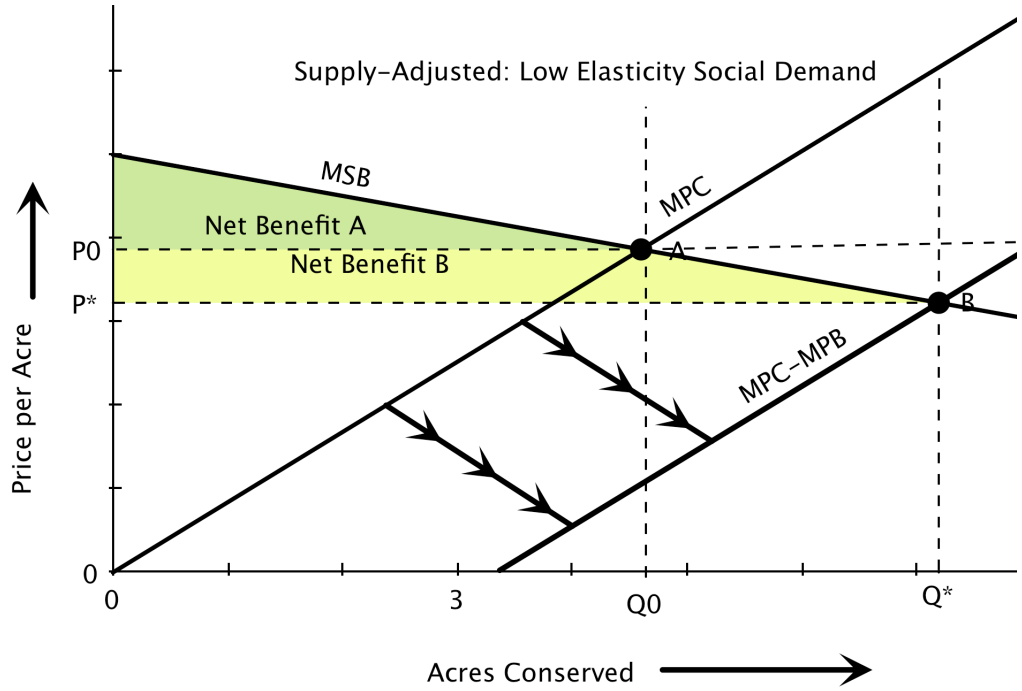
Throughout this exploration of conservation easements and the non-market values that are so critically inherent in them, we have extracted some significant lessons for the way in which land trusts need to approach conservation. Cautions on the burdens of perpetual stewardship and specialized targeting strategies provide us with some insight into the current state of scholarly inquiry into conservation easements. Both of these considerations must be heeded by non-profit organizations if they have are interested in an efficiently and effectively managed long run conservation goal.

The supply-adjusted approach to incorporating non-market, privately accruing landowner benefits warrants further discussion. The reason that such an analysis is even necessary is that given private incentives, this equilibrium exchange will not be achieved. The social benefit of conservation is to be determined by the land trust or other appraisal agencies, and this information is crucial to the adherence and fulfillment of a mission. However, there exists no effective system by which the true willingness to accept of a private landowner is discovered. The landowners themselves would likely know at least the degree of their willingness to accept, even if they cannot estimate an exact amount. However, the private incentive of the landowner in negotiating a conservation easement sale is to maximize their own private benefit, with comes from both the private non-market benefits of conservation, as well as the compensation price offered by the land trust.

There exists a balance between the benefits of non-market values and the financial compensation of a sale. If the marginal private benefit of lowering an easement price, and thus increasing the acres protected, were greater than the marginal cost of the foregone payment, it would be in the best interest of the landowner to drop their acceptance price, capturing a higher net benefit.

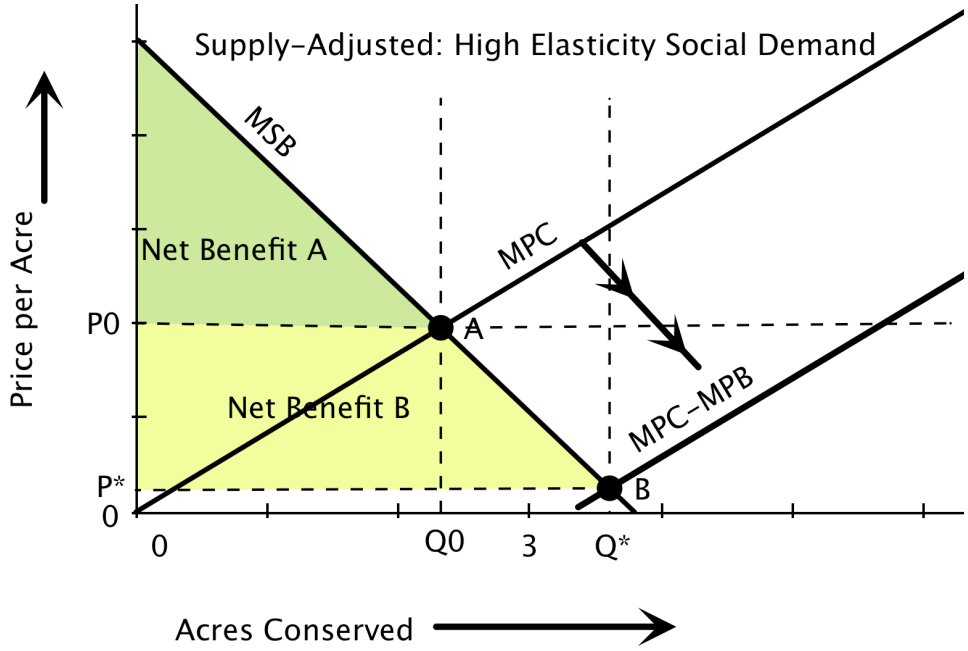
Additionally, if the marginal social benefit of conservation was more elastic, the supply-adjusted shift would not change the equilibrium price much, and the marginal private cost of revealing non-market private benefits would be very low. Such a demand curve might arise when there are increasing returns

to conservation that balance out the decreasing marginal social benefit, such as would be in the case with environmental amenities. In this case, the landowner has a relatively strong incentive to reveal their private marginal benefits.



On the other hand, if the marginal cost of lowering the selling price outweighs the marginal private benefit of conservation, the landowner will not have any incentive to reveal their willingness to pay, but rather hide such information and seek a higher compensation for the easement. If the demand for social benefits is less elastic, the increase in acreage will come with a great drop in price, and the marginal cost of the landowner revealing their preferences will increase. An inelastic social demand curve for conservation would arise when there are adequate substitutes that would return a comparable social benefit if resources were re-allocated, such as might be the case when concerning

recreation values. In this situation, the lack of an incentive will require the landowner to take action in revealing the supply adjustment, as the landowner only has the incentive of optimizing private benefits. He or she will do so by equalizing marginal private benefits and marginal private costs. If the purchasing agent were unable to estimate the landowner's marginal private benefit, the resulting allocation would be at some point along the demand curve between points A and B.



Through these insights, we see that a land trust must consider the elasticity of demand to gauge to how severe a degree the landowner is hiding their private benefits. Is the demand is more elastic, the land trust might assume that the landowner will rationally reveal his own preferences. With an inelastic supply, though, the landowner would not have the private incentive to sell a socially optimal level of conservation, and instead would maximize

their private benefits. Therefore, it would be potentially beneficial for the land trust to attempt to elicit the true willingness to accept of the landowner in order to efficiently allocate resources.

These lessons introduce the possibility of a land trust needing to somehow discover the landowner's true willingness to pay. This requires the valuation of the private non-market benefits that accrue to the landowner. While some of these values might be estimated through observable characteristics such as current land use, family history, and previous donative behavior, other values are only voluntarily revealed, such as an option value or a bequest value. Contingency valuation and hedonic pricing only goes so far as to estimate to expected value of a sample population, and thus the random variations that arise in different individuals would result in under- or over-estimates, and inefficient targeting or purchasing actions. One of the most effective methods to force individuals to reveal their true willingness to pay would be in an auction, where suppliers will bid each other down to their minimum acceptance price. This would be the most effective way to reveal the landowner's true willingness to pay.

While the auction format might be very effective in revealing true private benefits, the mechanics of an auction process are prohibitive. Typically a large budget must be available, because once a price is accepted, the auctioneer agrees to pay the landowner that determined price. If a land trust were to operate an auction, they would find that they were unable to perform critical

targeting of the land conservations that would return an optimal social benefit. The publicly funded Conservation Reserve Program has undertaken auctions that have forced landowner to reveal their true willingness to pay. Their allocation method is to allow landowners to compete for an available funding budget, and through this process we can see evidence that such a tactic would be effective for true willingness to pay exposure.[49]

Due to the risk of resource misallocation when using an auction system, a two-stage process would need to be set up. First, the non-profit could go through a ranking process that would identify parcels that would not only yield a high social benefit if conserved, but would benefit from the use of an auction mechanism to reveal prices. For example, the non-profit might not be interested in risking a misallocation of their funds by allowing a landowner to enter into the auction process whose decision faces a relatively elastic demand curve, because this individual would already have an incentive reveal a willingness to pay closer to their true value. After a ranking process is complete, the land trust could conduct an invite-only auction, so that even though there might not be a perfect allocation of their funds, they would avoid a greater loss by narrowing the pool of auction participants to only owners of property desirable for conservation. This strategy may not be the best way to allocate resources in every conservation action, but it would

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[49] Jeffrey Ferris and Juha Siikamaki, "Conservation Reserve Program and Wetland Reserve Program: Primary Land Retirement Programs for Promoting Farmland Conservation," *Resources for the Future*, (2009)

provide much more accurate data on a region's willingness to accept conservation on their property. Small, localized land trusts could then extrapolate this data onto other project, and then enter into negotiations with the landowner having a more accurate gauge of a target price. Other variations of this auction system may be more effective for different circumstances, but the underlying power of revealing true values would be useful in any allocation design.

VI. Conclusion

The land conservation sector has in recent decades emerged as an effective substitute to public agencies for the provision of public goods. The efficiency advantages that the non-profit has over government organizations has proven itself in the growing number of land trusts over the past decade as well as the high levels of donative funding today. By taking an in-depth look at the mechanics behind non-market values, conservation easements, and non-profit land trusts, we have been able to critically approach some of the existing literature, taking lessons from some, and refuting the conclusions of others. In the analysis, three of the main concerns for land trusts were investigated, with considerable time spent on the proper consideration on private non-market benefits that accrue to the landowner. Multiple papers have addressed the difficulties that arise when non-market values are present, though it is only recently that there has been an investigation into how to incorporate them into decision-making processes.

Critical work on the ways in which land trusts target and acquire conservation easements is far from over. The largest difficulty that arises is the nature of the non-market values that are targeted by every non-profit conservation effort. The open competitive real estate market leaves no room for non-market values to be efficiently allocated, and thus the ways in which our competitive economy deals with them require further development. Policies have been developed over the past few decades that have dealt with negative and positive externalities through private economic incentives, but there is still a shortfall in the prevention or provision of such goods.

Further work in this area would benefit from more empirical analysis of the Conservation Reserve Program auctions to see if such an allocation framework would be effective in revealing true willingness to pay levels. Additionally, regression analysis of specific non-market benefits would help provide acquiring agencies with more accurate methods of estimating efficient conservation equilibrium without needing to directly elicit willingness to pay. The lessons on land trust intermediaries concerning information coordination and collective stewardship responsibilities could be further delved into, as the long run benefits they would provide increases the integrity of the entire non-profit conservation sector. Investigating the relative efficiencies of non-profits and public agencies in allocating resources efficiently could have significant policy conclusions, resulting in more effective, more careful conservation.

In the meantime, land trusts will continue to respond to social demands for land conservation, and donations and public grants will continue to allow them to do so. The long run question of the effectiveness and equity of land conservation has plenty of room for criticism as well as support, but for now it seems that there is a majority of support for the provision of natural amenities.

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