

ASSESSING LANDOWNER PERCEPTIONS AND PRICES OF
CONSERVATION EASEMENTS IN FLORIDA

By

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This thesis is dedicated to my family, Nelson Jr., Mary, and Susie Mashour, and to my fiancé, Hugh Hamilton McClelland IV. Their support was unconditional throughout this project. To Shumsie Xienne Allan, Thelma Mashour, and my dad for their green thumbs and love of plants and nature. This document is especially dedicated to my late Situ and Jidu, Sadie Oskar Meide and Moses Meide, Sr.. This thesis is also dedicated to Leon Allan and Winston Johnson. To Clara Tanous Mida and Abraham Mida, Shamoun Monsour Oskar and George Oskar, Adelie George, and Shumsie Xienne Allan for making the passage to the United States from Syria to provide better lives for their children. May the Arabic communities throughout the world always work towards peace in the Middle Eastern countries.

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Abstract of Thesis Presented to the Graduate School
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Conservation easements (CE) are being utilized in greater numbers in the United States as a tool to preserve natural resources. Utilized to preserve buffers between urban and natural areas, conservation easements target private farmland, open space, and timberland. Understanding landowner preferences as well as defining the CE market may help resource managers in preserving additional land.

A Florida landowner survey was conducted for this study to assess landowner preferences for the conservation easement. An analysis of variance, logistic regression, and content analysis were used to uncover landowner perceptions of the CE as a method of preservation. Nine hundred seventy six surveys were mailed to households in Alachua County, Gilchrist County, and landowners who had attended one of three Florida Forestry Association (FFA) Conservation Easement Workshops. The survey results indicate that the county in more need of supplemental income and more interested in protecting their lands and natural resources are significantly more interested in utilizing the CE. Also,

cost/benefits, contractual issues, and socioeconomics were significant variable groups raising or lowering the probability that a landowner would be interested in entering into a CE agreement. Results will assist agencies working with landowners to place more land into preservation with CEs and offer guidance to policymakers on how to mold the CE policy.

A hedonic analysis is utilized to determine the variables significant in assessing the price of a conservation easement. Fifty-one conservation easement transactions in Florida were analyzed using a hedonic analysis to determine the extent to which land attributes and deed restrictions explained the price for the agreement. Factors such as land attributes, deed conditions, and location were found to increase CE prices. Results will assist conservation organizations in targeting lands for conservation, creating new appraisal methods, and providing price information for landowners that can help with price negotiations and land use planning. Also, the awareness that upland forests increase CE prices could provide an incentive for landowners to place more land in forests and ultimately aid in the preservation of natural resources as well as increasing the buffer between the wildland-urban interfaces.

CHAPTER 1 INTRODUCTION

Background

Rural farms and forestlands provide a variety of vital environmental services including life support processes, ecosystem functions, and beneficial amenities (Daily 1999; Gluck 2000; Garkovich 2000). In addition to providing these services, farm and forestlands in Florida contribute over \$25 billion annually to the economy. In the recent past, many rural lands in Florida have been converted to urban development and other uses. For example, between 1936 and 1995, timberland in Florida decreased by 5 million acres. With a population influx of nearly 900 residents per day into Florida, more rural lands will disappear. This will bring significant changes in the rural landscape, pose threats to the survival of many rural communities, and strain ecosystem function.

The government of Florida has undertaken ambitious land acquisition programs to address this situation. For example, under the "Preservation 2000" program, between 1990 and 2000, the state government expended \$3 billion towards land conservation programs for the first decade of this millennium (FDEP 2001). The Florida Forever program has committed to spend another \$3 billion between 2000 and 2010 to conserve rural lands in Florida. At the local level, Alachua County has committed to spend about \$29 million to conserve environmentally sensitive private lands. These programs emphasize the use of conservation easements (CE) as a preferred option to conserve rural lands.

As urban boundaries are expanding, many governments (federal, state, and local) across the nation are trying to grapple with policies to restrict urban sprawl and conserve rural lands (Anderson 2001). These include zoning regulations to stabilize urban boundaries, subsidizing infrastructure development in old urban centers to attract new residents, acquiring rural lands for preservation using tax dollars, buying conservation easements (less-than-fee ownership in property), encouraging the donation of conservation easements (CE) through tax policies, compensating rural landowners for generating environmental benefits (paying for public goods), and charging households the “full cost” of new residential services such as infrastructure and associated environmental impacts (Anderson 2001).

Conservation Easements

Recently, there is a growing preference for market-based approaches, such as conservation easements, to conserve lands. Government and non-governmental agencies at various levels have begun to actively “buy” CEs on rural private lands (Plantinga and Miller 2001). According to the Uniform Conservation Easement Act, a CE is a nonpossessory interest of a holder in real property imposing limitations or affirmative obligations of the purpose of which include retaining or protecting natural, scenic, or open space values of real property, assuring its availability for agricultural, forest, recreational, or open-space use, protecting natural resources, maintaining or enhancing water quality, or preserving the historical, architectural, archaeological, or cultural aspects of real property. In effect, under a CE, the owner of the land splits the bundle of property rights, reserving the rights to engage in certain activities such as hunting, farming, and subdividing, while ceding the right to development and to engage in potentially environmentally-degrading practices (Cheever 1996). On the other hand, both

governmental and environmental agencies can achieve the objectives of conserving farms and forestlands at lower cost, relative to outright purchase, while ensuring stability in rural farm and forest dependent communities (Anderson 2001).

Conservation easements have both costs and benefits. Advantages to the landowner include monetary compensation and tax relief in the forms of: lower income taxes, lower property taxes, eligibility for lower federal gift and estate taxes, and possibly an estate tax exclusion (Main et al. 2003). Also, the land remains in its current use meaning landowners may continue their production activities as specified in the deed. Public benefits include aesthetics, ecosystem services, and preserving the wildland urban interface buffer. Benefits to state agencies responsible for land conservation may include lower initial buying price for land conserved in perpetuity, which also allows the land to remain on the tax base, and reduced management costs. Costs incurred by the landowner to sell a CE include managing the land using best management practices (BMPs) such as preventing invasive species, legal fees, and the potential for extended periods of negotiating time. Costs to the public include utilizing public bond money or taxes for land that does not always allow public access. In addition to the initial payment, the purchasing agency must also incur expenses associated with time spent negotiating the agreement, activities required for sales associated with land (surveys, appraisals, title insurance, etc.), and the subsequent monitoring of the parcel to ensure conditions are being met.

Conservation Easements allow land trust agencies (public or private) to acquire partial rights, mostly development rights, on private farm or forestlands by compensating rural landowners or providing tax benefits (American Farmland Trust 1999; Gustanski

and Squires 2000). Under this approach, landowners can continue their productive practices such as agriculture and forestry, ensure stability of rural communities, and decrease sprawl to open areas.

In Florida, a total of 320,366 acres of rural lands were bought through less-than-fee purchases for \$180 million, or at \$563 per acre, as found from the Florida Water Management Districts and the Florida Department of Environmental Protection. For comparison, the average price of rural lands bought under full-fee purchases in Florida was \$1,326 per acre. Donations to private organizations in Florida have placed around 45,000 acres of land under CE at \$0 direct payment cost. A case study from Suwannee River Water Management District (WMD), which has 24 parcels of land under CE, illustrates the cost benefits of CEs relative to outright purchases. This district currently has 173,500 acres conserved through full-fee purchases totaling \$115 million, or \$664 per acre. Suwannee River WMD obtained CE agreements on 140,000 acres through less-than fee purchases totaling \$49 million, or \$348 per acre. Since CE agreements are perpetual, the district ensured the objective of conserving rural lands at a lower initial cost (Table 1.1).

Table 1.1 Price Comparisons for Suwannee River WMD Land Acquisition

	Total Cost	Total Acreage	Price Per Acre
Fee Simple	\$115,179,747	173,500	\$664
CE	\$48,882,906	140,569	\$348

The conservation easement appraisal process is similar to that of the fee-simple purchase. Valuation is based on two appraisals; the first appraisal determines the market value of the property “as is” without the CE, the second determines the value with the easement. The difference between the market value of the first and second appraisal is

the value of the easement rights. For example, a parcel with a market value of \$100,000 may be worth only \$60,000 without the development rights. The easement value paid to the landowner would be \$40,000. This “before and after” appraisal methodology is used to calculate the federal income tax deduction taken by a property owner who sells a CE (Appraisal Institute 2001). Presently, easements are not valued for their natural value, the restrictions the landowners take on, nor the historical value that the easement may be protecting; easements are strictly valued by the market values.

Wildland-Urban Interface

Future efforts to protect biodiversity and ecosystems in the US may be geared toward preserving natural resources on privately owned lands, as well as increasing the buffer in the wildland-urban interface. The wildland-urban interface is characterized by areas of urban sprawl where homes, especially new subdivisions, press against public and private wildland, such as private non-industrial or commercial forest land, or land under public ownership and management (Hughes 1987). In the interface, physical changes to forest ecosystems such as habitat fragmentation, reduction in connectivity, changes in biodiversity, encroachment of invasive species, increase in storm water, and increased soil erosion may be common (Macie and Hermansen 2002). One objective of resource managers is ensuring space between these wildland and urban areas to prevent possibility of these physical alterations. However, protecting the natural aspect of the wildland-urban interface may not be the solitary goal of conservation officials. Fire managers in the wildland-urban interface are concerned with protecting people and, therefore, built structures and maintain natural areas as a means to prevent damage from wildfires (Macie and Hermansen 2002). Establishing a land base without development between these

contrasting areas may be a form of protection for both sides and CEs are increasingly completing the deed.

Problem Statement

Previous research suggests that landowners are interested in CEs, as will be identified in the literature review in chapter 2; however information is needed to assess how various dimensions of the CE influence landowners' interest towards this method. Also, little information exists describing the CE valuation process. Specifically, information is needed to describe the effect of land attributes and deed restrictions on the stated price of the CEs in Florida. Information on these issues is critical for assisting conservation organizations, reforming appraisal methods, participation of stakeholders in the CE market, and for formulating policies to further the use of CE agreements. This study attempts to fill the gap by examining Florida landowners' perceptions of and preferences towards CEs. With this information, policy makers may better understand landowner preferences, assess CE valuation, and inform landowners and policy makers about the value of CEs in Florida.

Study Objectives

The primary objectives of this study are to understand landowner perceptions about CEs in Florida and factors influencing the price of CEs in Florida. These issues are addressed through a landowner survey and a hedonic analysis, respectively. Specifically, the following three research questions are addressed:

- Question I: What are landowner perceptions about various dimensions of CE agreements and how do socioeconomic factors influence the interest of landowners towards CEs?
- Question II: Is there variation in perceptions about and interest towards CE agreements among landowners from Alachua County, Gilchrist County, and those who attended CE workshops?

- Question III: What factors have influenced the price of existing CE agreements in Florida?

Study Area

Florida's rural land base has experienced a five-fold increase in urban conversion between 1964 and 1997 with a loss of nearly 5 million acres of valuable agricultural lands during this period, with most of the loss involving ranch and forest lands (Reynolds 1999). Florida's population of 16 million is anticipated to increase to about 24 million by 2030 (Cato et al. 2003). Thus, more development pressure is expected. In addition, Florida is expected to lose nearly 1.3 million acres of land to urban conversion in the next ten years (Reynolds 1999). It is evident that something must be done to encourage land protection.

And Florida has done something. Florida's rural land conservation programs began in 1964 with a \$20 million bond program (Florida Department of Environmental Protection 2004). A second bond program was established in 1972 to purchase environmentally sensitive lands and the program was expanded to include conservation and recreation lands in 1979. Preservation 2000 was developed with a budget of \$3 billion from 1990-2000 and was eventually merged into the Florida Forever program, which has another \$3 billion to spend between 2001 and 2010. To date, Florida land acquisition efforts have purchased 3.8 million acres for \$3.7 billion.

Florida enacted the Uniform Conservation Easement Act¹ in 1986, however the state has made changes to the law. For example, all CEs in Florida are perpetual in

¹ The UCEA was a recommended model conservation easement law approved by the National Conference of Commissioners on Uniform State Laws. The National Conference and the Bar Association approved the CE law in 1981. Many states have adopted this form, however each state reserves the right to make amendments.

nature, meaning the deed lasts forever on the land. However, this amendment is known to be controversial. The perpetual nature can be deemed null and void if both agency and landowner agree. However, it is unlikely that conservation agencies would agree to end the agreement. The perpetual nature in itself is controversial. Many landowners believe that termed easements, those agreements lasting 20-30 years in length, are favored. It is difficult for landowners to see the value of their land into perpetuity from one lump sum. An additional amendment was added to the act by Florida. This states that the grantee of an easement, the group that buys the easement from the landowner, can assign the easement to another entity if for some reason the grantee cannot maintain it (Gustanski and Squires 2000). This is termed “transferability.” Transferability of the CE deed may also be of controversy due to the deed being able to be given to an unknown agency for continued management.

The holders of easements, the agency or organization, may monitor them to ensure that the land use restrictions are being observed, and the fee title landowner may not deny access for such purposes (Gustanski and Squires 2000). Florida also requires that CEs shall be of notice to the tax collector and property appraiser so as to ensure that those involved in assessing and appraising land take account of the easement in their valuation procedures. Also, an additional amendment by Florida to the UCEA also includes limited liability of organizations holding easements in the state (Gustanski and Squires 2000). Therefore, anyone being hurt on the property may not subject the holder to any liability.

In order to answer the first two research questions included in the study objectives a questionnaire was administered to landowners in Florida. Three groups of landowners

in Florida were selected to be surveyed—landowners from Alachua County, Gilchrist County, and those who attended workshops on CEs sponsored by the Florida Forestry Association (FFA).² Landowners from Alachua and Gilchrist Counties were chosen due to their apparent contrasts. Alachua County is larger with 965 square miles of land housing 191,000 year round residents including 45,000 University of Florida students. The median household income as of 1990 was \$66,000. The county went through a referendum to create a land conservation bond program,³ producing Alachua County Forever. Gilchrist County has a smaller population with 12,531 residents residing in 349 square miles. The median household income is \$23,208. The area is more rural, relative to Alachua County, and has no land conservation program. Despite the dissimilarities, both counties are located in North Florida and have similar natural land attributes. All Florida counties are shown in Figure 1.1. FFA CE workshop attendees, the third group,

² In order to provide required information relating to CEs, the Florida Forestry Association has conducted a series of workshops for farm and forestland owners across central and north Florida.

³ ACF is a voluntary land conservation program to protect environmentally significant lands. Through this program, the residents of Alachua County acquire, improve and manage environmentally significant lands, protect water resources, wildlife habitat, and natural areas suitable for resource-based recreation. Natural communities in Alachua County include 430,000 acres of pinelands, grasslands, swamp, springs and open water, hardwood hammocks, and sand hill.

In 1999, 84% of Alachua County voters polled felt that if natural lands were not protected now they would be lost forever. A citizen-led effort coordinated by the Legacy Lands PAC developed the ordinance and bond referendum for this program. The initiative was strongly supported by many different community groups. The Alachua County Commission recognized that its citizens treasured many of the county's natural resources that contribute greatly to their quality of life and adopted the ordinance on July 25, 2000. The referendum passed with over 60% of the popular vote on November 7, 2000. Voters agreed to raise up to \$29 million through a quarter-mill property tax to fund Alachua County Forever land acquisitions. Alachua County was the 21st County in Florida to have a funded land acquisition program.

The 11-member Land Conservation Board is appointed to review the data compiled by staff, and forward recommendations to the County Commission for purchase. Once purchased, the properties are managed as preserves under a Commission-approved stewardship plan. ACF is housed in the Alachua County Environmental Protection Department and currently employs three full time staff. Where possible, contractors, volunteers, interns and existing County staff are used to implement the program. As of September 2003, ACF has received 61 applications from private citizens and non-profit organizations nominating over 167,000 acres for protection, and had acquired 2,500 acres for about \$5 million. ACF has also actively developed almost \$13 million in grants and partnerships to extend the local taxpayers funds for existing projects. (Buch 2003).

were chosen to assess the impact of workshops on landowners' perceptions and interests towards CE agreements. The FFA provided the list of workshop attendees.

To answer the third research question included in the study objectives, CE agreement transaction data were obtained from Florida's water management districts, illustrated in Figure 1.2, and the Florida Department of Environmental Protection. All districts, except South Florida, have CEs. Each district abides by its own CE acquisition guidelines as well as qualities to look for in a CE. The development pressure in South Florida, St. John's River, and Southwest Florida WMDs is high relative to the remaining districts. Florida CEs as they lay throughout Florida are found in Figure 1.3 in black.

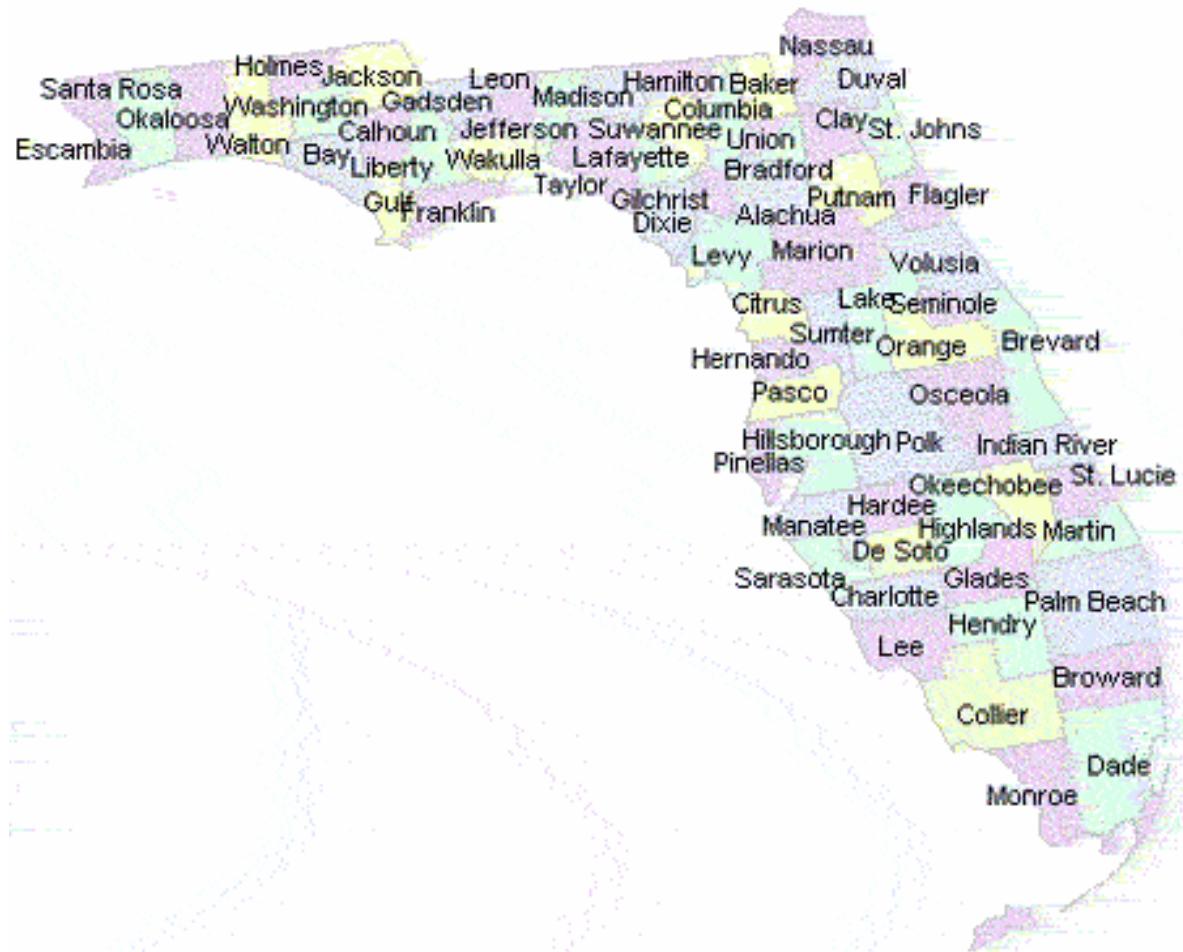


Figure 1.1. Florida Counties

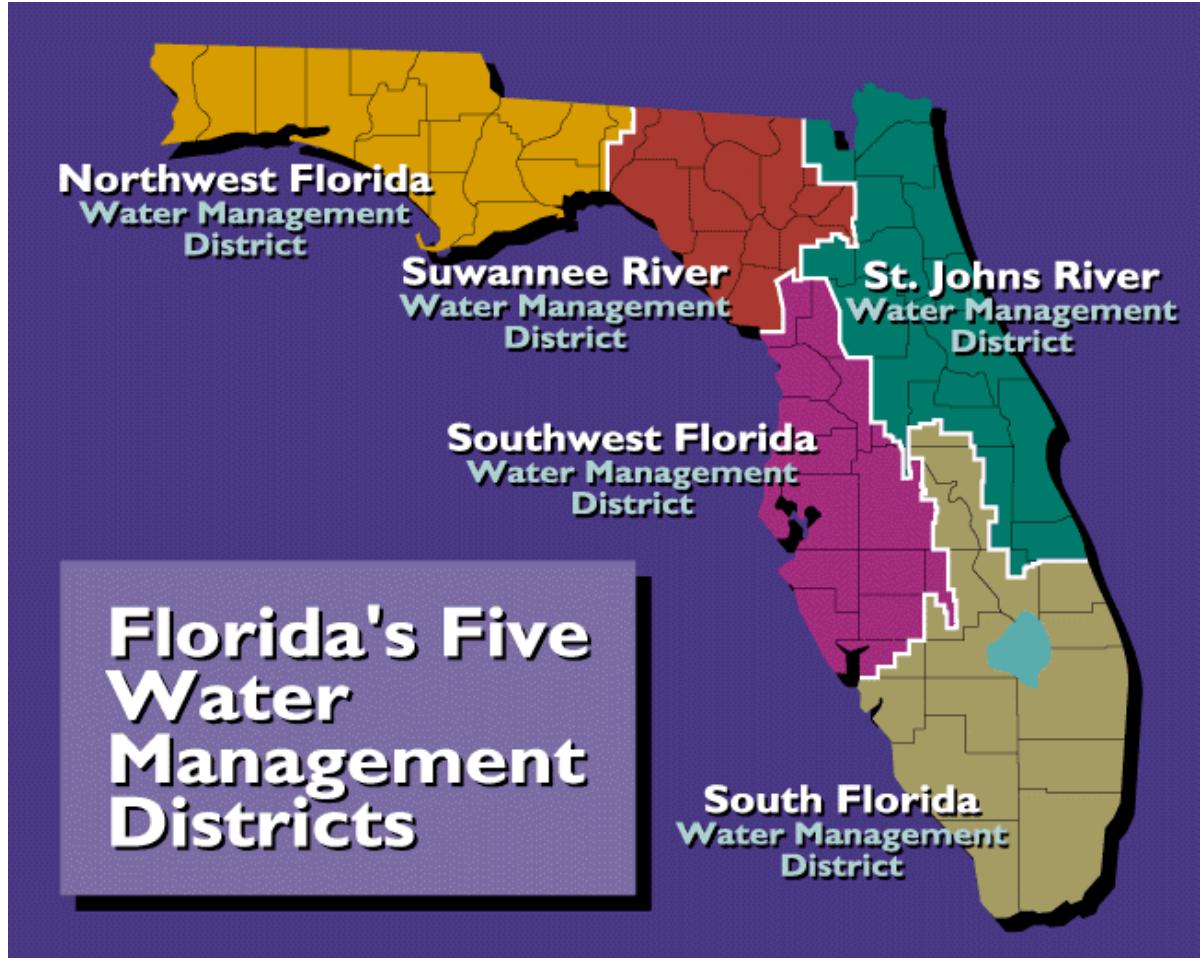


Figure 1.2. Florida's Water Management Districts.⁴

⁴ Picture courtesy of South Florida Water Management District, www.sfwmd.gov/histo/3_5wmd_map.html.



Figure 1.3. Location of Conservation Easements in Florida⁵

Significance of the Study

Conserving rural lands in the wildland-urban interface is imperative in times of heavy urban sprawl. These lands provide a variety of vital services, including the production of market goods (such as wood fiber), life support processes (such as air and water purification), ecosystem functions (such as wildlife habitat and biodiversity), and beneficial amenities (such as beauty and serenity) (Daily 1999; Gluck 2000; Garkovich 2000). Conservation easements are an increasing popular form of protecting these areas (Plantinga and Miller 2001). However, little literature is available on current landowner perceptions of CEs and the market value of such agreements.

⁵ Conservation Easements are found in black spots throughout map. Lighter gray areas are county boundaries, rivers, and lakes.

Uncovering landowners' perceptions from these areas will provide insights on how better to design agreements in Florida, and as extrapolated to the remaining U.S., to increase participation of landowners in CE markets, increasing conservation of additional natural and wildland-urban interface areas. Also, uncovering the variables significant in influencing the price of the CE in Florida will provide information to agencies throughout the nation. Also, discovering that certain natural attributes or deed restrictions increase CE prices, which represent to this form of supplemental income to the landowner, may encourage landowners to sell CE rights on additional land parcels.

Thesis Overview

The thesis is organized as follows:

Chapter 2 delves into the evolution of the use of CEs as a tool for land conservation in the U.S. then continues with a literature review of CE research in the U.S. and Florida.

Chapter 3 explores landowners' perspectives about CEs. Drawing on the literature, I begin with an overview of landowner perception research. I then discuss the questionnaire design and methodology. The chapter presents results on landowners' perceptions and interests towards CEs, analyzes a possible variance in groups opinions in the CE, and summarizes their comments from a comment section.

Chapter 4 explores the issue of valuing the CE from stated transactions in Florida. It begins by presenting the background of valuing CEs in Florida. The research design and data collection procedures are then discussed. Results of a hedonic analysis are presented and discussed. The final section includes a summary of implications for the future research.

Chapter 5 is the final section of the thesis. It provides an overview of the research findings and offers conclusions related to the perceptions of landowners and the valuation of CEs in Florida. The Appendix section follows and concludes with references.

CHAPTER 2

LITERATURE REVIEW

Introduction

Urbanization directly alters forest ecosystems by removing or fragmenting forest cover and indirectly by modifying hydrology, altering nutrient cycling, introducing nonnative species, modifying disturbance regimes, and changing atmospheric conditions (Zipperer 2002). The process of urbanization significantly affects agriculture through direct (land conversion) and indirect (technical, regulatory, market price, and speculative) effects (Lopez et al. 1988). In Florida, population growth and urban expansion will result in continued conversion of agricultural and rural lands into residential and commercial development (Agriculture and Resource Conservation Assessment 2002). Not only does the prevailing development pattern threaten the state's ability to meet the needs of citizens through adequate delivery of services and the maintenance of an agricultural economy, it also interrupts the natural hydrological and biological functions that support both agriculture and healthy ecosystems (Agriculture and Resource Conservation Assessment 2002).

Agricultural land conservation is an option to curb the issue of urban sprawl. However, whereas utilizing public funds for private lands may seem inequitable, this option does create benefits for society. Gardner (1977) refers to four benefits:

1. “sufficient food and fiber to meet the nutritional requirements of a growing national and world population;
2. local economic benefits that derive from a viable agricultural industry;

3. open space and other environmental amenities that accrue chiefly to urban residents; and
4. more efficient, orderly, and fiscally sound urban development.

On the other hand, whereas the public is affected by use of tax dollars for private land preservation, landowners are also affected. If land is immobilized in agricultural use, they forfeit the direct wealth gains in price appreciation that would have occurred with the possibility of changing use in a free market (Gardner 1977). Nevertheless, whether landowner or public, community stability presently is a prime issue of concern. Some might argue that income and wealth differences among regions may justify prime land retention in order to prop up the dominant local industry-agriculture (Gardner 1977). Equity issues of farmland preservation may also be scrutinized by the apparent market failure: urban sprawl creates loss of open space and environmental amenities. These goods are a right for both sides. And whereas Gardner (1977) believed that requiring agricultural landowners bearing the cost of the agricultural protection programs in the form of foregone increases in land prices, presently many landowners, agencies, and the public are more and more interested in agricultural land conservation. And the CE is the means that accomplishes preventing the natural attribute market failures. This project aims to examine landowner perceptions and study the valuation of the CE development rights in Florida in order to improve the understanding of this method.

Conservation easements (CEs) are a tool to conserve natural resources and preserve a buffer between the wildland-urban interface. CEs offer a means for protecting and preserving ecological diversity, open space, and other environmental qualities on private lands without relying on government regulation (Morissette 2001). A CE divides the bundle of rights typically associated with private land partnership. By distinguishing the

conservation right, CEs provide a mechanism by which a public good can be provided through private markets in lieu of regulation (Morissette 2001).

CEs may now be competing with full fee purchases as well as acting as a complimentary tool. CEs allow conservation agencies to acquire rights to protect natural resources on private lands that might not have been in the market for full fee purchases. CEs may also preserve open space bordering natural areas, a type of buffer. CEs enable the preservation of private lands as open space or wildlife habitat without requiring the landowner to transfer the fee interest in the property, and, thus, are a remarkably effective and efficient tool for preserving private lands (Morissette 2001). This chapter will summarize the history of CE agreements and past research relevant to this study.

Conservation Easements: A History

During the 1880's conservation easements were utilized to protect parkways designed by Frederick Law Olmstead Sr. in and around Boston (Gustanski et al. 2000). However, due to a technicality in their drafting, the CEs were invalidated in the 1920's. Easements have been used for scenic preservation and habitat preservation purposes by federal and various local governments since the 1930's. One scenic acquisition by the National Park Service in the 1930's and 40's protected some 1,500 acres along the Blue Ridge and Natchez Trace Parkways in Virginia and North Carolina. Also, in the 1950's, the state of Wisconsin established a highly successful easement acquisition program to protect land bordering the Great River Road along the Mississippi River (Gustanski et al. 2000). Table 2.1 shows an itemized timeline for the development of the CE.

Table 2.1 Relevant Instances in the Development of CEs in the US, 1880-2000.

Year	Events
1880's	CEs were utilized to protect parkways designed by Frederick Law Olmstead Sr. to protect parkways in and around Boston.
1920's	Due to a technicality in their drafting, the Boston easements were invalidated.
1930's	Easements were used for scenic preservation and habitat preservation purposes by federal and various local governments.
1930's	
40's	The National Park Service protected some 1,500 acres along the Blue Ridge and Natchez Trace Parkways in Virginia and North Carolina.
1950's	State of Wisconsin established a highly successful easement acquisition program to protect land bordering the Great River Road along the Mississippi River.
1959	Article by William H. Whyte in a technical bulletin for the Urban Land Institute, "Securing Open Space for Urban America: Conservation Easements."
1960's	Additional states began to enact legislation concerning CEs.
1970's	There were enough states still without easement laws, or with inadequate laws, to have a National Conference of Commissioners on Uniform State Laws.
1981	Uniform Conservation Easement Act (National Conference of Commissioners on Uniform State Laws).
1982	The Land Trust Alliance was founded.
2000	In Florida, the Preservation 2000 and Florida Forever land preservation programs have billions of dollars to CEs and land. Current programs include: Rural Family Lands Protection Act, Forest Legacy, Save our Rivers, Farm and Ranchland Protection, Wetland Reserve Program, Alachua County Forever, Land Trust Alliance, Conservation Trust for Florida, and other county and conservation organizations.

The idea that conservation covenants could be used as a tool for private land preservation efforts has its origin in the article by William H. Whyte's technical bulletin entitled, "Securing Open Space for Urban America: Conservation Easements" (1959). This was the first time an entire publication had been devoted to explaining and promoting this then-obscure conservation tool (Gustanski et al. 200). In terms of

educating planners, conservationists and policy makers about a new way of protecting land without acquiring it, this article helped as a major step toward CE use (Gustanski et al. 2000).

Other aspects aided in the evolution of conservation easements, including farm groups. The federal government's efforts to slow farmland conversion began with the passage of the Farmland Protection Policy Act in 1981. This directed federal agencies to evaluate the extent to which federally funded projects lead to the conversion of agricultural lands and to consider less harmful alternatives. The regulations were issued in 1994, but failed to effectively prevent farmland conversion.

The Farms for the Future Act of the 1990 Farm Bill set the precedent for Federal funding by authorizing the Resources Conservation Demonstration Program. This program provided guaranteed loans and subsidized interest payments to state and local farmland protection programs. Congress however did not appropriate funds in 1995. The Farmland Protection Program superceded the program in 1996.

The Farmland Protection Program is the most significant step the Federal Government has taken to date to support state and local farmland protection efforts. In fiscal year 1996, 41 entities in 18 states have been awarded more than \$16.2 million in federal matching funds (Farmland Information Center 2004). Section 388 of the Federal Agriculture Improvement and Reform Act authorized up to \$35 million in matching funds over six years to state and local programs for the purchase of agricultural conservation easements and other interests in productive farmland (Farmland Information Center 2004). Legislation has been a major reforming force of conservation easements in history. Although the validity of common law conservation easements given to

government has been affirmed in the US, statutory reform has been necessary to allow meaningful use of conservation easements by private groups (Anderson 2001).

Legislation in the U.S. has aimed at promoting the benefits of conservation easements while eliminating the existing legal obstacles. Legislation allows these interests to be held by private conservation organizations. In some cases, legislation has also amended procedures for registering interests in land to accommodate the unique characteristics of conservation easements. Another important legislative response at both the state and federal levels has been to institute tax reform aimed at promoting the use of such interests (West Coast Environmental Law 2004).

In the 1960's, states began to enact legislation specifically dealing with conservation easements (Gustanski et al. 2000). States, including California, Connecticut, Massachusetts, New York and others, designed laws to clarify many uncertainties regarding CEs. Statutes defined what a conservation easement was, stated how they could be created, and declared how they could be enforced and by whom (Gustanski et al. 2000). By the late 1970's there were enough states still without easement laws, or with inadequate laws, to have a National Conference of Commissioners on Uniform State Laws. This conference began work on a Uniform Conservation Easement Act. The Commissioners approved the law in August 1981 and the American Bar Association gave its approval of the Act afterward. This was a significant advancement for conservation easement law, prompting a number of states to adopt or revise easement statutes.

Presently, land trusts have arisen and easements are used more and more. A land trust is a private, nonprofit conservation organization formed to protect natural resources

such as productive farm and forestland, natural areas, historic structures and recreational areas. Land trusts purchase and accept donations of conservation easements. They educate the public about the need to conserve land, and some provide land use and estate planning services to local governments and individual citizens (Farmland Information Center 2004). The Land Trust Alliance (LTA) was founded in 1982. The LTA pioneered the use of conservation easements to conserve private land, and is now embarking on a bold strategic plan to: dramatically expand the pace of land conservation (through tax incentives), build strong land trusts, defend the permanence of conservation easements, and ensure that the work of land trusts is as strategically directed as possible (Land Trust Alliance 2004). Land trusts led the land conservation movement through an extraordinary period of expansion and success as the number of nonprofit land trusts has nearly tripled in two decades (Land Trust Alliance 2004). Presently in Florida, the Preservation 2000 and Florida Forever land preservation programs work with billions of dollars to buy conservation easements and land. Conservation easements have come a long way from the initial version of acquisition law and are likely to be utilized as a major conservation tool in the 21st century.

Assessing Landowner Perceptions

CEs are a commonly used tool for land conservation and studies have shown positive feelings from landowners towards the method. Ranchers in Arizona were found to resist selling ranches at market prices far exceeding their livestock operations for reasons that included “love of the land” and “love of rural values” (Hunt et al. 1996). In California, it has been shown that CEs address ranchers’ concerns about their financial stake in the land by providing either income/estate tax deductions for the donation of an easement or a potentially large percentage of the less than fee simple price for the sale of

an easement (Hunt et al. 1996). Marshall et al. (2000) found that landowners tended not to enter into an easement for financial reasons, but motivations for land protection stemmed more from keeping the land in its current use. These findings are positive for CE as a use for land conservation. However, issues are present for this method.

Landowners do not fully understand what to expect when they start considering an easement agreement (Marshall and Hoag 2001). The idea is complicated and it is easy to believe that there is something tricky going on behind the agreement. Also, it is thought that the appraisal process has its pitfalls, as found by Daniels (2001). First, a CE appraisal is simply an educated guess of what a property would fetch on the open market or from another farmer (Wright 1994). Second, most appraisals of rural land are based on comparable sales. This data may be difficult to compile, both for sales of similar farms for development and for transactions between farmers. Third, the appraiser may be inexperienced in valuing farmland and development rights. Additionally, high administrative costs and the difficulties of explaining the system to citizens have combined to hinder the application of the concept across the country (Wright 1994). The CE is an incentive based strategy for regulating best management practices on private land and halting development sprawl. However, buying CEs costs money, especially when the value of land has been inflated by public investment in roads, schools, and water sewer systems as shown by American Farmland Trust (1997), and the high cost of purchasing easements on farmland results in a very slow pace of protection.

The enforcement of land regulations is spotty at best, but unlike zoning, an easement is attached to the land deed and runs with the land (Daniels 2001). A violation of an easement provision could result in the loss of tax benefits and the government

agency can require redress of any violation. Typically government agencies are preoccupied with acquiring easements and spend little time on monitoring and enforcement (Daniels 1991). This may result in the landowner being released from management or restoration duties, leaving agencies liable for the costs.

Governing boards of agencies often question whether CEs are a useful tool. Research illustrates when conservation organizations and/or government agencies may adopt the CE. Feather and Bernard (2003) found these motivations:

1. On the demand side a certain level of wealth and urban pressure is needed. On the supply side there must be a critical mass of farmland to initiate and sustain a preservation program.
2. CE programs will probably not appear in slow growing areas with a large amount of agricultural land.
3. Regions of the country experiencing a rapid growth in population and income coupled with rapid development of open spaces (e.g. Florida) or near large cities are likely candidates for future CE programs.
4. As open space decreases, the demand for CE programs should increase.

Also, Kline and Wichelns (1993) describe the “farmer clout hypothesis.” They believe that a positive relationship exists between farmland acreage and the demand for farmland retention due to farmers exercising political power. This is an additional means where CEs will be adopted. However, these findings do not take into account the ability to donate CEs for conservation. Donations are a means to acquire land at no cost, independent of conditions ripe for farmland program adoption.

Landowner probability of adoption of the CE as well as benefits has also been researched and discussed. Feather and Barnard (2003) found that a landowner would sell the development rights to a parcel if the payment exceeds the expected gains from development less the use of the parcel in its present state. The principal economic

incentives for landowners are income and estate tax deductions equal to the value of the development rights retired (Wright 1993). Donations again are an option for CEs. The donation of a perpetual CE to a qualified receiver, such as a county or land trust, is considered a tax deductive charitable conveyance under federal law and the IRS tax codes (Wright 1993).

Public interest in the CE has also been researched. It was found that the public believes environmental objectives such as protecting groundwater and wildlife habitat, and preserving natural places should be important objectives of farmland protection programs (Kline and Wichelns 1996). Kline and Wichelns (1996) also found that aesthetic objectives, such as preserving scenic landscapes, should be given greater interest in agricultural preservation programs.

CE Hedonic Analysis Literature Review

Analyses of land prices at the urban fringe can assist policy makers who must make decisions regarding property valuation, preferential property tax treatment, urban zoning, and programs such as purchasing development rights to agricultural lands (Shonkwiler and Reynolds 1986). Hedonic analysis research has generated information specific to agricultural land valuation and the valuation of CEs. Past research indicates agriculture land values are a function of both agricultural and amenity variables given various demands for rural lands (Bastian et al. 2002). Providing information on the effects of the different characteristics to the easement cost could help formulate policy decisions and selection criteria, which would maximize preservation of the agricultural economy and/or maximize public preferences (Lynch and Lovell 2002). Lynch and Lovell (2002) describe the need for information on the marginal contribution of easements by providing a wetland example. Appraisal methods may discount the price for a property with

wetlands, riparian buffers or other resource features. Yet state or local communities might wish to encourage enrollment of land with these attributes and thus include a positive weighting mechanism for them (Lynch and Lovell 2002).

Research on agricultural land valuation indicates that remote agricultural lands, which include wildlife habitat, angling opportunities, and scenic vistas, command higher prices per acre than those which primarily possess agricultural production capacity (Bastian et al. 2002). Bastian et al. (2002) utilized geographic information systems (GIS) variables to illustrate how they can be incorporated into a hedonic analysis. GIS permits a quantitative means of affixing land characteristics to their location (Bastian et al. 2002). The GIS development provides more explicit variables and model specifications than qualitative representations such as an ordinal ranking of land attribute levels or indicator variables signaling the presence of amenities (Bastian et al. 2002). This is important baseline information for policies intended to preserve environmental amenities, improve valuation of agricultural CEs, and reduce land use conflicts (Bastian et al. 2002). A hedonic rural land study using GIS was provided by Kennedy et al. (1996 as cited in Bastian et al. 2002) and identified rural markets in Louisiana based on economic, topographic, and spatial variables. GIS was used for defining distance to urban markets as well as soil type variables (Bastian et al. 2002). In this study, GIS variables will be incorporated to describe the land attributes of CE parcels in order to see the effects that attributes have on prices.

A large amount of CE research has been conducted in Maryland. Here, development pressure is immense and CE programs have been used to preserve many acres of farmland. One project was conducted regarding the variables influencing

landowners into entering into a CE agreement as well as studying how much their farmland parcel values dropped after entering into an easement agreement. It was found that landowners with larger parcels and parcels closer to preserved parcels were significantly more likely to enroll in preservation programs (Nickerson and Lynch 2001). Also, landowners whose parcels were further from Baltimore and Washington D.C. were more likely to enroll (Nickerson and Lynch 2001). Nickerson and Lynch (2001) also found that preservation agencies tend to favor preserving larger parcels and those near already preserved parcels. This research found that participation costs and landowner responsibility to manage the land, were not significant, suggesting that the costs for implementing soil conservation and water quality plans were not important since participating farmers had already implemented these measures (Nickerson and Lynch 2001). Also, it was discovered that there is little statistical evidence that voluntary permanent preservation programs significantly decrease the farmland in Maryland. The results imply that agencies may have a basis for reducing easement payments since the land values do not appear to be reduced by the full value of development rights (Nickerson and Lynch 2001).

A second Maryland study identified what variables influenced the price of CEs. A hedonic analysis was utilized to explain the easement payments paid to landowners who were selected to preserve their parcels by county purchase of development rights programs. The study found a high explanatory power for Howard County in Maryland. This county has been using a point system based on parcel characteristics to determine easement payments since 1989 (Lynch and Lovell 2002). The study found that the closer the parcel was to the city, the higher the easement value (Lynch and Lovell 2002). This

indicates those parcels attempting to curb urban sprawl near urban centers garnered higher property values due to proximity to cities whereas those lands further from the city could be conserved using less funding. High prices for city access dissipated around 45.4 miles from the city (Lynch and Lovell 2002). Additionally, results indicated the higher the percentage of agricultural land in a parcel, the lower the easement value, however, parcels with higher percent of prime soil garnered higher CE prices (Lynch and Lovell 2002). It was thought in this study that agriculture is easy to convert to urban uses and would therefore garner higher prices, however this was not the case. The results suggested that the goal of providing agricultural products might not be a priority of program administrators in Maryland, but rather the provision of open spaces such as forests (Lynch and Lovell 2002). Higher prime soil may be a benefit to conservation organizations for farmland, but also conservation objectives, which would illustrate higher CE prices. Lastly, it was found that easements bordering large bodies of water were more expensive, easement price declines with size, and county level programs paid more than state programs (Lynch and Lovell 2002). Those lands bordering large bodies of water typically garner higher prices. Similarly land valuation studies typically find a type of bulk rate in larger land parcels, bringing lower prices for substantial parcels.

These results are useful to administrators who will need to consider these quality and cost tradeoffs between the different attributes of a parcel when deciding if an easement will be purchased (Lynch and Lovell 2002). Also, the results can be used in models along with measures of amenity benefits to determine the optimal number of acres and the most cost-effective location to target (Lynch and Lovell 2002). The study in this project will assess Florida CE valuation to find what aspects of parcels are being

valued positively, negatively, or not significantly. Utilizing Maryland research and Florida results may aid in developing a point system for Florida CE appraisals in the future.

CHAPTER 3

LANDOWNER PERCEPTIONS ABOUT CONSERVATION EASEMENTS

Introduction

Among the many measures to protect land, the conservation easement (CE) has now earned the position of being the most widely used private sector land conservation tool across the nation (Gustanski and Squires 2000). Nearly 1.4 million acres of land has been protected by CEs as of 2000 (Gustanski and Squires 2000). The goal is to acquire parcels that border wildland, buffering these areas from urban ones. Some objectives are to preserve agricultural resources and farming activities, while many states also describe secondary objectives, such as preserving wildlife habitat, providing public access to outdoor recreation, protecting groundwater, and preventing development (Kline and Wichelns 1996). It has been found that the public believes that environmental objectives such as protecting groundwater and wildlife habitat, and preserving natural places, should be important objectives of farmland preservation programs (Kline and Wichelns 1996). Many local governments have voted for land conservation programs including those programs that involve utilizing the CE with bond money or tax dollars. However, landowners are a key stakeholder in attaining the goal of preserving space in the wildland-urban interface. Agencies target lands in a management plan, then hope to gain acquiescence from each landowner to enter into the agreement. With much research on public interest, policy makers are unable to know if landowner perceptions about the CE as a form of land conservation are consistent with public support for this method. Policy

makers wanting to improve the efficiency of CE programs can utilize this missing information.

The support of the farming community for a CE program is crucial due to the voluntary nature of the program (Daniels 1991). If farmers perceive that the program will be of financial benefit to them, they are likely to participate (Daniels 1991). But if offers to purchase development rights are not competitive with the development option, then farmers will probably avoid the CE program and take a wait-and-see stance toward selling their land for development (Daniels 1991). Also, agreement of landowners is important to forming undeveloped corridors through the use of a CE buffer rather than acquiring fragmented parcels. A New York experience was illustrative of this potential issue. A problem arose when only one-quarter of the CE applicants accepted offers in the second phase of the Suffolk County purchase of development rights program. Thus the land under protection was scattered (Daniels 1991). Also, the CE option is voluntary. The voluntary element means that many farmland owners may choose not to participate in a CE program, undermining the accumulation of a critical mass of farmland to support the agricultural infrastructure (Daniels 1991). Missing the landowner link may cause problems such as development occurring more rapidly than farmland preservation (Daniels 1991). Knowledge of this stakeholder group is essential to utilizing the method for preservation purposes, however the specific variables that influence landowners' interest in entering into a CE agreement are relatively unknown. Understanding landowner preferences towards various aspects of the CE as well as what socioeconomic characteristics influence landowner interest into a CE agreement may be used to further CE programs.

This chapter examines landowner preferences regarding CE characteristics and identifies landowner awareness of the program. Data collected from three different landowner groups in Florida were used to construct a regression model of landowner preference. Analysis of variance is utilized to examine possible differences in the awareness, perceptions, and socioeconomics of the three groups. Lastly, content analysis is employed to develop four themes from respondents' qualitative responses. Results from the study suggest cost/benefits issues highly influence the interest of landowners towards entering into a CE agreement, the more rural surveyed group illustrates variation from the other surveyed groups, and landowners' comments about CEs indicate positive feelings towards the use of the CE, a need for more information, negative feelings towards government intervention, and issues with the perpetual nature of the easement.

The plan of the chapter is as follows. The following section discusses the survey design. Methodology and approach are discussed in the third section. Next, the results and discussion are presented. The final section includes the summary and conclusions.

Measuring Landowner Preferences

Florida has unique urban sprawl issues. Nine hundred residents will immigrate into Florida each day. Florida's rural land base has experienced a five-fold increase in urban conversion from 1964-1997 (Reynolds 1999). To help curb urban sprawl in Florida, CEs have been in place since the 1980's and the Florida Forever program is a major funding source for them.¹ So far, ninety-two easements have been bought less than fee by the Florida water management districts and the Florida Department of Environmental Protection, while many have been donated to private organizations.

¹ Funds for CEs channel through the water management districts, the Florida Environmental Protection Agency, county organizations, and Florida Land Trusts.

Florida, wherein CEs are perpetual by law, has tried to create powerful and encompassing language concerning CEs and legislators have tried to tilt the scale in favor of encouraging the donation or sale of CEs (Anderson 2001). Understanding landowner perception may help legislators be more informed on how to tip the scale. Landowner preferences to CE programs depend on the compatibility of the program in meeting the goals and objectives of landowners. For example, some landowners will appreciate the goal of lowering taxes while still keeping their land in its current use, while others will appreciate the preservation of their land from development into perpetuity (Kline and Wichelns 1996). The objective of this study is to identify the variables that significantly contribute to landowner interest or disinterest in entering into a CE agreement. A survey instrument was designed, to examine landowner preferences, by drawing information from several sources.

Modified Focus Groups

Due to budget and time constraints, modified focus groups were utilized. The researcher attended three conservation easement workshops to gain background information on the topic. Two workshops were conducted by the Florida Forestry Association² in Lake City, FL, and Blountstown, FL. The attendees were landowners interested in better understanding the CE. In these workshops, panel discussions and lectures by professionals including lawyers, water management district employees in land acquisition, and private companies were utilized to teach about the topic. The School of Forest Resources and Conservation, University of Florida, gave a third workshop as a

² FFA conducts workshops to inform its members on how to work with and conserve forests for the future. wwwffa.org

part of its Continuing Education Program.³ Participants included land acquisition professionals, tax agents, private landowners, attorneys, and academicians. After the workshops, the researcher discussed with several participants their perceptions about the CE and what factors would influence landowner interest in a CE. The information that was gathered through these stakeholders formed the basis in developing the survey instrument.

The information that was gathered through these workshops was rich and diverse. Many stakeholders expressed the advantages associated with the CE in the form of additional income tax specifics. Many landowners were interested in keeping their rural lands protected from urban sprawl as well as lowering taxes. Many were interested regarding specifics of the CE. Some landowners contacted afterward the workshops were still unsure of the specifics of CE and related programs. One landowner stated, “Yeah, we applied for some program, but I can’t remember what it was and we haven’t heard back yet.”

Fourteen issues were developed through content analysis of notes from these workshops and post workshop phone interviews (Table 3.1). Workshop attendees expressed that the amount of income, tax benefits, and management issues are central for CEs. Reasons to do a CE included keeping the land in its current use, limiting urban sprawl, and environmental concerns. Researcher’s interactions with participants of workshops also highlighted the need for more information about the CE and related programs for landowners and other stakeholders.

³ SFRC Continuing Education offers workshops for professionals to gain Society of American Foresters Credits at the University of Florida.

Table 3.1 Themes Identified From Modified Focus Group Content Analysis of Conservation Easements

<u>CE Characteristics</u>
Payment for CE
Rural Community Stability
Estate Tax Deductions
Urban Sprawl associated with CEs
Estate Tax Deductions for Heirs
Environmental Services Preservation
Additional Management Costs
Provision for monitoring
Extra Time Associated with Learning about Easements
Legal Fees
Property Tax Deduction
Ability to Keep the Land in its Current Use
Perpetual Nature of CEs in Florida
Provision for Agencies to Transfer Deed

Survey Design

The survey instrument was divided into three sections. The first section questioned respondents' familiarity with easements, whether they had sold an easement, and whether they had been asked to sell an easement. A paragraph was then included to describe easements and how they work. This helped us to educate each respondent to a base level in order to enable us to question the landowner about characteristics of the CE. In the next section, we utilized focus group information to question respondents about their perceptions on the characteristics of the CE. These were based on a 1-5 scale-1 being very negative influence, 3 being no influence, 5 being very positive influence (see APPENDIX A for survey details). Following these questions was placed the dependent variable question, "After reading the paragraph and stating your opinions on the characteristics of CEs, how interested would you be in entering into a CE agreement?" This question was based on a likert scale of 1-5, 1 being highly interested, and 5 being no interest. The last section consisted of socioeconomic questions to utilize respondent

background to determine what makes landowners have certain perceptions about CEs.

Refer to APPENDIX C for survey details.

The survey was pre-tested by sending it by email to thirty landowners from a forestry conservation education list. Ten surveys were returned and modifications were considered.

Sampling Design

The sample frame consists of three different landowner groups. Landowners from Alachua and Gilchrist Counties and CE workshop participants (from those attendees at workshops organized by the Florida Forestry Association (FFA)). Alachua and Gilchrist County landowners were obtained from their respective property appraiser's office. We believe that the property appraiser has a comprehensive list of all landowners in these counties, therefore making the list representative of these counties. Landowners with acres of forty or more, the lowest considered for a CE, and with agricultural classification were chosen for the study. These two counties were selected as they can be compared and contrasted. They each have a wide array of landowners-timber, ranching, crops, and absentee. However, they differ in the fact that Alachua has a current land acquisition conservation program, Alachua County Forever, which was voted on by the public in 1998. Gilchrist County presently does not have a land acquisition program. The Florida Forestry Association list contains all types of landowners with attendees from all over North Florida. This group may have a different perspective on conservation easements as they may be more aware of the option and therefore have more informed opinions.

Gilchrist County landowners and the FFA list were not samples, but taken as a census. Their lists were small and our budget allowed us to include all (357) in our survey. A list of 3000 names was downloaded for Alachua County. This list was then

narrowed down. Only Florida residents were surveyed once meaning duplicated landowners who own more than one land parcel as well as the out of state landowners were removed. Since there was a fair distribution of each type of landowner, we performed a simple random sample for this list. Each name was placed alphabetically and numbered one through one thousand. One thousand random numbers were generated in Microsoft Excel and the first six hundred forty three landowners were selected, thereby making the total sample one thousand (Alachua 643 and Gilchrist and FFA 357). In this random number generation, each landowner in the county had an equal probability of being selected.

Due to time and budget constraints, we used the tailored design survey method. One half of the names from each of the three lists were randomly chosen, producing about 500 names. The names were chosen from a random number generation in excel. These landowners were sent a presurvey postcard (APPENDIX D). This was an alert noting that a questionnaire would be sent to them within one week's time. This was an attempt to study the presurvey postcard method and its effect on survey response rate. This was also a method of improving response rate with a limited budget.

One week later, the questionnaire was sent out to the total group (APPENDIX C). The lists were color-coded, shown in Table 3.2. Peach represented the FFA names that were sent a presurvey postcard, pink for those that weren't. Green represented the Gilchrist county landowners who received the presurvey postcard and blue represented those who didn't. Tan represented those Alachua County residents who received a presurvey postcard, canary for those who didn't. One week later the non-respondents were sent a reminder postcard (APPENDIX F). A week later those left were sent a

reminder cover letter (APPENDIX G) with a questionnaire. Three weeks later the surveys ceased to be returned.

Table 3.2 Description of Mail Out Color Coding and Response Results.

	Alachua	FFA	Gilchrist
Presurvey response	tan 42%	peach 60.80%	green 20.70%
Non pre-survey response	yellow 35.20%	pink 60%	blue 36.80%
Total	returned	396/976	40.60%

Out of nine hundred seventy six surveys successfully mailed, 396 were returned, which indicates a 40.6% response rate. Alachua County landowners who received a presurvey postcard returned 42%; non-presurvey postcard receivers had a 35.2% response rate. FFA conservation easement workshop attendees had each group send back 60% with the presurvey postcard receivers sending back 0.8% more. Gilchrist County presurvey postcard group sent back less surveys with 20.7% response and those who did not receive a presurvey postcard sent back 36.8%. The presurvey postcards worked well for improving the response rate for Alachua County. The FFA presurvey group did not bring a larger response, which may be due to the overall higher responses. This group may have been more knowledgeable about CE and was therefore interested in responding. The Gilchrist County group not receiving the presurvey postcard had a higher response. This indicates that most landowners, even those who were not alerted of the questionnaire, were interested in the survey topic. The hotness of the topic of CEs, the relevancy of the issue towards landowner property rights, and relief for many landowners from rising property taxes may have motivated landowners to speak their opinion, explaining the higher response rate and response from non alerted landowners. Three hundred fourteen responses were complete and utilized in this model.

Theoretical Framework

In order to describe landowner interest in entering into a CE agreement, four variable groups were added together to form a model conceptual framework. It was assumed that the probability that a landowner would be interested in entering into an easement agreement can be measured by analyzing the socioeconomic, environmental benefits, cost/benefits, and contractual issues of CEs.

In this framework, gender, age, acres, education, and those FFA members in attendance at workshops were grouped into the socioeconomic category. Environmental benefits include utilizing the CE to conserve the environment and utilizing the CE to curb urban sprawl. It is hypothesized that variables in this group would positively influence the probability that landowners will be interested in entering into a CE agreement.

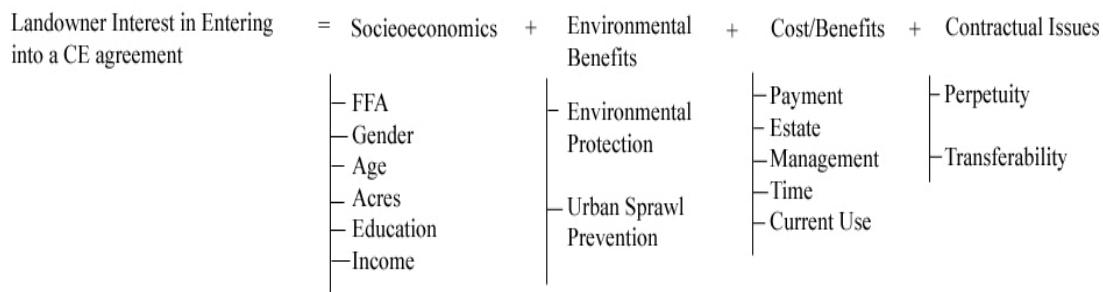


Figure 3.1. Conservation Easement Perception Theoretical Framework

The cost/benefits group includes the payment incentive associated with the CE, lowering estate taxes, management costs, time commitment involved, and the ability that the CE allows of keeping the land in its current use. The last category, contractual issues, includes the ability to transfer the deed to other organizations and the permanent nature of the easement agreement. This category was hypothesized to have a negative influence on the probability landowners will have of entering into an easement agreement. These

categories will be analyzed by utilizing a logit regression analysis. Figure 1 presents the model.

Methodology and Approach

Model for Landowner Interest in Entering Into a CE Agreement

In analyzing the perception of landowners towards CEs, the dependent variable (INT2), interest in entering into a CE agreement, was recoded 1 for those responses of 1-4, or any type of interest in a CE agreement, and 0 for 5, or no interest. This dichotomous coding led to the use of a logit model for analysis. The logit model is used for modeling the relationship between a binary response variable, which may take only two different values, and other explanatory variables. The explanatory variables may be either categorical variables or continuously valued variables.

The variables describing landowners' interest in entering into a CE agreement have been separated into two categories: CE perceptions and socioeconomic. Explanatory variables are described in the following paragraph.

Landowner Explanatory Variables

Data on landowner perception and socioeconomic characteristics were collected through the survey process (see Appendix A for survey).

Payment

The payment gained from the CE was a positive issue learned from the CE workshops. Landowners will gain an income addition through the sale of their development rights. It was believed that payment would have a positive influence on landowner interest in entering into a CE agreement.

FFA

FFA members have sought out information from CE workshops and are more aware about the topic of CEs. It is hypothesized that these landowners will be more interested in entering into a CE agreement due to these factors.

Management Expenses

One public benefit from buying CEs for land conservation is the savings from low management expenses. However, this means that landowners are responsible for the possible expense. The management may range from using herbicides to deter invasive species to wetland ecosystem restoration. In this study it was thought that this management expense would be a negative influence on landowner perception, negatively influencing landowner interest in entering into a CE agreement.

Estate Taxes

Tax benefits to the landowner are generated by a CE and are determined by subtracting the value of the land after the easement from its value before granting the easement (Provisions of the tax reform of 1976 and Tax Treatment Extension Act of 1980 in Daniels 1991). The sale of an easement can provide a retiring farmer with a nest egg to live on, and reduces the value of the farm for estate tax purposes (Daniels 1991). This provides lower taxes for heirs, lessening their need to sell the land to curb tax burdens. It was thought that tax benefits would have a positive impact on landowner interest in entering into a CE agreement.

Sprawl

CEs help prevent urban sprawl to rural areas and help to conserve rural community stability. It was therefore hypothesized that preventing urban sprawl would create a positive influence for landowners.

Environmental Services

The origins of CEs are in use by government agencies to protect scenic routes and wildlife habitat (Daniels 1991). Today land trusts have more land conservation. Protection of wildlife habitat is the number one source of protection at 76.6%. Also, protection of forests, open space, scenic views and roads, ecosystems, recreational greenways and trails, flood plains and ranch lands (Gustanski and Squires 2000). It was thought that the benefit of conserving the environment by means of the CE would have a positive effect landowner interest in entering into a CE agreement.

Current Use

One benefit that the CE has for landowners is the ability to keep lands in their current use. CEs normally lower the property tax and estate tax base. Therefore landowners do not have to sell their land parcels due to high taxes and heirs have the opportunity to keep land instead of selling due to high taxes. Therefore land is conserved while being able to maintain its original use allowing the landowner to keep their income and part of the taxes remain on the tax base. This variable was thought to have a positive affect on landowner interest in entering into a CE agreement.

Perpetuity

The UCEA stipulates that a CE is unlimited in duration unless the instrument creating it otherwise provides. However, the Florida law states easements must be written in perpetuity. Landowners may feel this time period is too long, while others may be interested in doing a CE for the fact that their land will be protected in perpetuity. We believed that more landowners would be against this aspect, garnering a negative impact on entering into a CE agreement.

Transferability

Once the CE deed is signed, the buying organization may not be interested in the up keep of the CE. They may transfer the deed to an organization that will monitor the CE into the future. After coming to an agreement with one organization landowners may not be comfortable with the deed moving to another organization's jurisdiction. This variable was hypothesized as having a negative influence on landowner perception towards the CE.

Time

A great time commitment is needed to learn about CEs, choose and organization, and negotiate the CE contract. It was hypothesized that the time commitment would have a negative impact on landowner interest in entering into a CE agreement.

Gender

A priori expectation is unknown for this variable.

Age

Older landowners are aware of the changing landscapes and the threat that development brings toward agriculture communities. They are also aware that their heirs may not be able to afford estate taxes and may be forced to sell. Heirs may be planning to sell simply to make money off the land. It is thought that landowners want to keep their lands in current uses and our hypothesis was CEs would have a positive influence on landowner interest in entering into a CE agreement as age increases.

Total Acres Owned

Even with a bulk rate that comes with purchasing larger acreage amounts, more acres of land ownership will bring a higher income for landowners. This will bring a greater incentive for entering into a CE agreement. In this study, it was hypothesized that

larger acreages would be a positive factor towards landowners entering into a CE agreement.

Education

Higher education is thought to bring awareness of conservation problems and an open mind to solutions. It is thought that education would be a positive variable for interest in entering into a CE agreement.

Table 3.2 summarizes the variables utilized in the CE perception model. CE characteristics were recoded into binary form as stated in Table 3.2. This was done so as to capture positive influence and negative influence in order to measure the effects of positive influences from these variables on interest in entering into a CE agreement. Socioeconomic variables were left as is with two exceptions. Income was recoded 1 for \$45,001 and above, zero otherwise; education was recoded 1 for college and above, zero otherwise. The model used to estimate the interest landowners have in entering into a CE agreement is as follows:

$$\text{INT2} = \beta_0 \text{PAYMENT} + \beta_1 \text{FFA} + \beta_2 \text{MANAGEMENT} + \beta_3 \text{ESTATE} + \beta_4 \text{SPRAWL} + \beta_5 \text{ENVT} + \beta_6 \text{CURRENT} + \beta_7 \text{PERPET} + \beta_8 \text{TRANSFER} + \beta_9 \text{TIME} + \beta_{10} \text{GENDER} + \beta_{11} \text{AGE1} + \beta_{12} \text{ACRES1} + \beta_{13} \text{EDUCATE} + \varepsilon \quad (1)$$

where INT2 is the value of the dependent variable, interest in entering into a CE agreement; β 's are the coefficients on each explanatory variable; and ε is the error term.

Table 3.3 Landowner Interest Logit Model Variable Descriptions.⁴

Variable	Expected Sign	Variable Description
Dependent Variable		
INT2		Dependent variable. 1 for response of 1,2,3,4, zero otherwise
Cost/Benefits		
PAYMENT	+	1 for response of 3,4,5, zero otherwise
ESTATE	+	1 for response of 3,4,5, zero otherwise
MANAGEMENT	-	1 for response of 3,4,5, zero otherwise
TIME	-	1 for response of 3,4,5, zero otherwise
CURRENT	+	1 for response of 3,4,5, zero otherwise
Contractual		
PERPET	-	1 for response of 3,4,5, zero otherwise
TRANSFER	-	1 for response of 3,4,5, zero otherwise
Environmental		
SPRAWL	+	1 for response of 3,4,5, zero otherwise
ENVT	+	1 for response of 3,4,5, zero otherwise
Socioeconomics		
ACRES1	+	Continuous variable for amount of acres owned by respondent in Alachua and/or Gilchrist County
EDUCATE	+	1 for college and above, zero otherwise
FFA	+	1 For FFA respondents, zero otherwise
AGE1	+	Continuous variable for age of respondent
GENDER	-+	1 male, 0 female

Analysis of Variance Among Alachua County, Gilchrist County, and FFA

The analysis of variance specification tests the equality of variances. The hypothesis for the study follows:

$$H_0: \mu_1 = \mu_2 = \mu_3 \quad (3)$$

H_a: At least one of the means differs from the rest

where μ_1 is the mean of Alachua County, μ_2 is the mean of Gilchrist County, and μ_3 is the mean of FFA members. The research hypothesis states that the means of group perceptions on CE agreements are different among Alachua County, Gilchrist County, and FFA members. The F statistic is found as follows:

⁴ Describe how variables were coded and why some are different. Refer to APPENDIX A for Landowner survey and example of responses.

$$\begin{aligned} MS_{\text{between}} &= SS_{\text{between}} / df_{\text{between}} & (4) \\ MS_{\text{within}} &= SS_{\text{within}} / df_{\text{within}} & (5) \\ df &= n - 1 & (6) \\ F &= MS_{\text{between}} / MS_{\text{within}} & (7) \end{aligned}$$

where SS_{between} is the sum of squares for each variable between the 3 groups and SS_{within} is the sum of squares within each variable (Ott and Longnecker 2001). MS is the mean squares found by dividing the sum of squares by the degrees of freedom (df). Degrees of freedom are found by subtracting the total responses collected from each group by 1 (6). The F statistic is found by dividing the mean squares between the groups by the mean squares within the groups (7). The significant test statistic used for degrees of freedom 3 and infinity is 2.47. If dividing the MS_{between} by the MS_{within} (7) brings an F statistic greater than 2.47, we will reject the null hypothesis and conclude that the means of the 3 groups are different.

Utilizing the LSD t test, we will determine which mean is different. By following these equations:

$$\begin{aligned} \mu_{\text{Group 1}} - \mu_{\text{Group 2}} && (8) \\ \mu_{\text{Group 1}} - \mu_{\text{Group 3}} && (9) \\ \mu_{\text{Group 2}} - \mu_{\text{Group 3}} && (10) \end{aligned}$$

it can be assessed whether the LSD t –stat obtained from subtracting one mean from each of the remaining means separately is significant. We will use a confidence level of 0.05. Fifteen variables were tested for analysis of variance among groups, Table 3.4.

Content Analysis

Content analysis is utilized for the comment section comments elicited from the respondents. Themes were identified from the content of the comments and classified into four categories. The survey collected ninety-one comments. Eleven responses were not applicable to the survey. Nine comments were from stakeholders involved with CEs.

The remaining comments were divided into the four categories, which ranged from positive feelings towards CEs along with negative feelings toward the method, negative feelings toward additional government intervention, and a need for more information.

Results and Discussion

Survey Descriptive Statistics

Descriptive statistics are found in Table 3.4. Alachua County residents had the most respondents with 245 while FFA attendees had 91 responses and Gilchrist County had 62 respondents. Twenty percent of the respondents have been previously queried about entering into an agreement and 6% have easements on their property. Average interest in obtaining more information on the CE was 2.11, or somewhat interested, while average interest in entering into a CE agreement was 57%. The payment incentive (PAYMENT), rural community stability (STAB), estate tax deductions to benefit heirs (HEIRS), curbing urban sprawl (SPRAWL), lowering estate taxes (ESTATE), lowering property taxes (PROPERTY) and keeping the land in its current use (CURRENT), were each shown to be positive influences on landowner interest in entering into a CE agreement. The management burden (MANAGEME), the monitoring of the CE (MONITOR), the time factor (TIME), legal fees (LEGAL), the ability to transfer the document to another agency (TRANSFER), and the perpetual nature of the deed (PERPET) were each found to be negative influences on landowner interest in entering into a CE agreement. Seventy-five of the respondents were male, 42% were ranchers and 25% worked with row crops. Most landowners, at 68%, considered themselves private nonindustrial. Average age was 62 years, average, income was 3.67, or between \$65,000 and \$85,000 per year.

Table 3.4 Descriptive Statistics for Landowner Survey¹

Variables	N	Min	Max	Mean	Std. Dev.
Alachua County	245				
Gilchrist County	62				
FFA Attendees	91				
FAMILIAR	393	0	4	2.27	1.07
ASKED	394	0	3	0.20	0.42
SOLD	393	0	2	0.06	0.26
INTEREST	382	0	3	2.11	0.81
PAYMENT	363	1	5	3.93	1.11
STAB	356	1	5	3.62	1.03
HEIRS	361	1	5	3.78	1.01
SPRAWL	358	1	5	3.59	1.12
ESTATE	360	1	5	3.72	1.02
ENVT	355	1	5	3.72	1.01
MANAGEME	352	1	5	2.57	0.96
MONITOR	356	1	5	2.60	0.96
TIME	358	1	5	2.69	0.91
LEGAL	354	1	5	2.34	1.02
PROPERTY	355	1	5	3.84	1.03
CURRENT	357	1	5	3.86	1.12
TRANSFER	351	1	5	2.72	1.42
PERPET	352	0	5	2.70	1.14
INT2	376	0	1	0.57	0.50
GENDER	374	0	1	0.75	0.43
2_AGE	371	28	93	61.24	12.73
5_ACRES	337	0	75000	569.79	4246.68
TIMBER	382	0	1	0.42	0.49
CROPS	382	0	1	0.25	0.43
RANCH	382	0	1	0.32	0.47
RECREAT	382	0	1	0.07	0.26
8_EDUCATION	383	0	5	4.16	0.77
9_INCOME	314	0	10	3.67	2.89
INDUST	365	0	7	0.02	0.37
SMBUS	365	0	1	0.17	0.38
PNI	365	0	1	0.68	0.47
NONPRO	364	0	1	0.04	0.19
ABSENT	365	0	1	0.05	0.22

¹ See Appendix A for survey details. Variables ranging from 1-4: 1-Very familiar, 2-Somewhat familiar, 3-Somewhat familiar, 4-Very Unfamiliar. Variables ranging 1-3: 1-Very interested, 2-Somewhat interested, 3-Not interested. Variables ranging 1-5: 1-Very negative influence, 2-Negative influence, 3-No influence, 4-Positive influence, 5-Very positive influence.

Table 3.5 Frequencies and Percentages of Response to Questions of Familiarity, Interest in Obtaining More Information, and Interest in Entering into a CE Agreement for the Three Surveyed Groups

	Familiarity				Interest in More Info			Interest in an Easement Agreement					
	1	2	3	4	1	2	3	1	2	3	4	5	
	n=240				n=239			n=234					
Alachua County	#	39	106	39	54	56	91	89	18	27	43	42	104
	%	16.3	44.2	16.3	23	23.4	38.1	37.2	8	11.5	18.4	18	44.4
n=62				n=59			n=57						
Gilchrist County	#	39	18	2	1	29	14	16	14	14	6	11	12
	%	63	29	3.2	1.6	49.2	24	27.1	25	25	11	19.3	21
n=91				n=84			n=85						
FFA	#	20	32	17	22	12	31	41	5	5	15	20	40
	%	22	35.2	19	24	14	37	49	6	6	17.6	24	47

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Table 3.6 Frequencies and Percentages of Response for CE Characteristics for the Three Surveyed Groups

	Payment			Perpetuity			Transferability			Environment			Property Taxes			
	-	0	+	-	0	+	-	0	+	-	0	+	-	0	+	
	n = 226			n=219			n=221			n=220			n=222			
Alachua County	#	25	49	152	113	41	65	91	82	47	24	65	131	24	47	151
	%	11	21.6	67	51.5	18.7	29.7	41.1	37.1	21.3	10.9	29.5	59.5	10.8	21.1	68
n=59				n=56			n=54			n=58			n=57			
Gilchrist County	#	0	3	56	28	5	33	17	19	18	0	12	46	0	11	46
	%	0	5.1	95	5	9	59	31	35.2	33.3	0	20.1	79.3	0	19.3	80.7
n=76				n=78			n=77			n=77			n=76			
FFA	#	6	19	53	38	19	19	29	36	12	3	2	46	5	21	50
	%	7.8	25	70	48.7	24.3	24.3	37.7	46.8	15.6	4	36.4	60	7	27.6	65.8

The frequencies and percentages of responses were divided into the three groups-Alachua County, Gilchrist County, and FFA respondents, to assess means separately, Tables 3.5 and 3.6. Table 3.5 illustrates the responses and percentages of respondents' familiarity with the CE, interest in obtaining more information regarding CE agreements, and interest in entering into a CE agreement. Alachua and Gilchrist Counties had the most frequent response in the 1 category, or very familiar. This may be due to the FFA members attending workshops and realizing that the easement concept is highly complicated, leaving this group recording a less familiar response. Interest in obtaining additional information on easement agreements was assessed. Alachua and Gilchrist Counties have more responses in the 1 category, or very interested in gaining more information on the CE. FFA members may have already gained additional information on this topic and may therefore record a low response in interest. Interest in entering into a CE agreement was also tested. Gilchrist County landowners have the highest interest in entering into easement agreements. FFA had the largest percentage of landowners in category 5, or not interested in entering into an easement agreement. This group may have attended the easement workshops and decided against the option.

Table 3.6 illustrates frequencies and percentages of the three groups opinions toward five CE characteristics. Many landowners were positively interested in the payment resulting from the CE agreement with Gilchrist County recording 95% interest. This may indicate that the majority of landowners are interested in this opportunity for supplemental income. Alachua County had the highest percentage of landowners against the idea of conserving their land into perpetuity whereas 60% of Gilchrist County

recorded interest. Gilchrist is illustrating a greater interest in preserving their farmland through this method.

The transferability variable had many respondents in each group reply negatively while the variable representing the ability CEs provide for landowners to protect the environment had more than the majority of the landowners in each group responding positively. An overwhelming majority of respondents from each group indicated the benefit of lowering property taxes through utilizing the CE. Indicating an interest in utilizing the CE for property taxes illustrates the rising property taxes due to urban sprawl and the need for farmers to lower this burden in order to protect their land.

Assessing Group Means

Model variables were evaluated to determine whether Alachua County, Gilchrist County, and FFA attendees demonstrated significantly different opinions regarding the CE. Many variables were found to differ among groups in mean perceptions of CE agreements. The analysis of variance results are found in Figures 3.2 and 3.3.

Familiarity, interest in obtaining more information about CEs, and interest in entering into a CE agreement, were found to differ among means; Gilchrist County was the differing group with the highest averages in all three variables, Figure 3.2. Whereas it seems as though FFA members should have more familiarity as they have attended information workshops, FFA members may be indicating a lack of familiarity in the depth of knowledge needed to understand the complexities of the CE. It makes sense that Gilchrist County may be more interested in obtaining more information on the CE agreement due to the fact that they may have less exposure to the concept. It is interesting to note that Gilchrist County also has higher interest in entering into an easement agreement. Conservation agencies may be interested in contacting this county

and other rural counties in Florida and the US to protect more farmland with CE agreements.

The characteristics for payment (PAYMENT), keeping the land in its current use (CURRENT), perpetuity (PERPET), and environmental services from the CE (ENVT) each varied among means with Gilchrist County containing the highest means for each variable. This indicates that Gilchrist County is more interested in the supplemental income, keeping their lands in farming forever, protecting their environment through this method, and protecting their lands forever. These issues are sensible as Gilchrist is the group with the lowest income and may have more interest in keeping their lands in farming to protect their livelihood, and protect it into perpetuity.

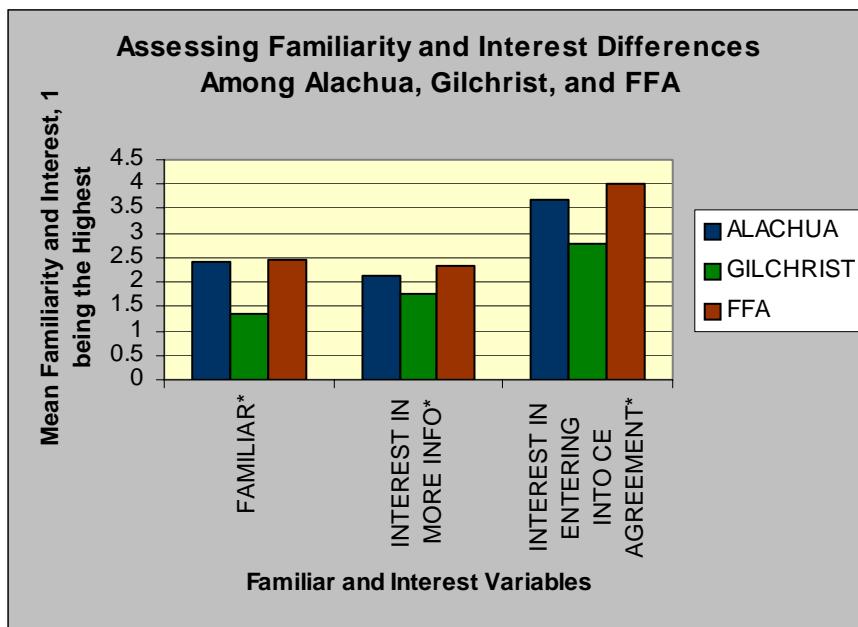


Figure 3.2 Assessing Familiarity, Interest in more information, and Interest in Entering into a CE Agreement Variables Among Alachua, Gilchrist, and FFA

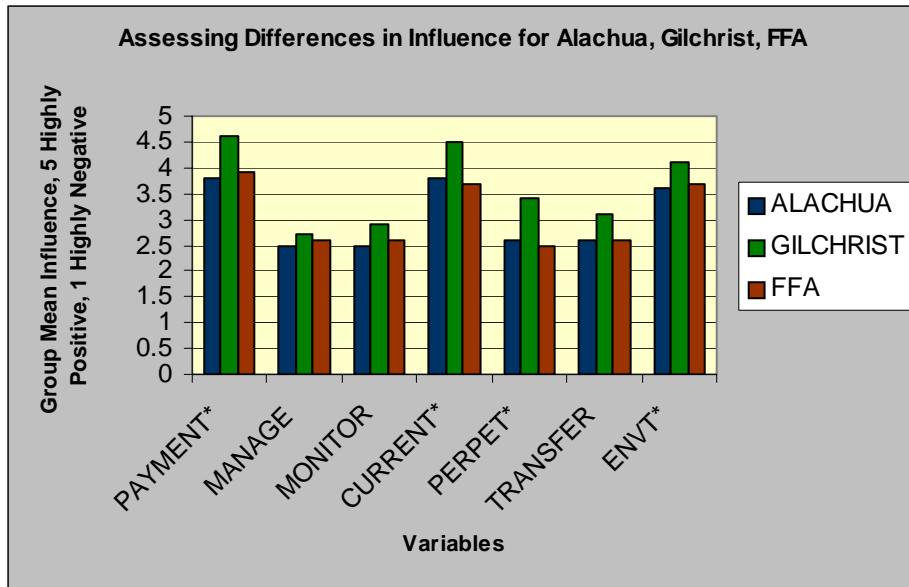


Figure 3.3 Assessing Differences in Influence from CE Variables on Alachua, Gilchrist, and FFA

Logit Regression Results

Results of the model explaining landowner interest in entering into a CE agreement are given in Table 3.7 and are analyzed in terms of overall significance of the model and the impact of each explanatory variable on landowner interest in entering into a CE agreement. The likelihood ratio test shows that the regression model is significant with Chi-Square statistics of 90.89. The result indicates that variables included in the model are significantly related to the dependent variable, landowner interest (INT2). The explanatory power of the model is given by the model goodness of fit statistics (R^2). Binary choice models upper bound R^2 is approximately 0.33 (D'Souza et al. 1993) so a value of 0.22 R^2 suggests the model has reasonable explanatory power. The results show that the model predictions are correct 87.2% of the time indicating that the explanatory variables allow us to specify the dependent variable with high degree of accuracy. Therefore results from this model can be considered reliable and utilized for considering CE policy modification.

In this model, many explanatory variables have the expected effect on landowner interest. While coefficients on PAYMENT, MANAGEME, CURRENT, PERPET, TRANSFER, EDUCATE are statistically significant at 5% confidence, variable AGE1 is significant at 10%. The variable (PAYMENT) shows a positive relationship to landowner interest. This suggests that landowners are interested in CEs due to the supplemental income they provide. This may be due to the additional income agricultural and rural communities may need. A study by Marshall et al. (2000) indicated that the initial interest in CEs was due to financial incentives. This also agrees with Feather and Barnard (2003) and Wright (1993) findings that a landowner would sell the development rights to a parcel if the payment exceeds the expected gains from development less the use of the parcel in its present state.

The variable (MANAGEME) shows a negative relationship with landowner interest. This suggests that respondents in rural communities are not interested in paying additional costs for the easement. Landowners are being asked to give up their development rights and this model indicates they do not want to give up additional income to manage the property according to government stipulations. This goes against Lynch and Nickerson (2001) who found that management costs for implementing possible soil conservation and water quality plans were not important, possibly due to the fact that farmers had already implemented these measures. BMPs from the respondents in this study may not be practicing Florida State BMPs which are currently optional and see management as a burden.

The variable (CURRENT) has a positive relationship with landowner interest. When sprawl extends to rural communities, property value increases. This causes taxes

to increase creating a large burden for landowners. Many are forced to sell their farmland, giving up their livelihoods. CEs create a method to lower property values, and therefore taxes, allowing landowners to keep land in its current use. Landowners are indicating this a positive function of CEs. This result is similar to Marshall et al. (2000), which found that after completing the CE process, landowners considered entering into CE agreements for land tenure purposes rather than financial reasons.

The contractual variable perpetuity (PERPET) has a positive relationship with landowner interest. This suggests that landowners are interested in CEs due to the ability to protect their land forever. Due to lower employment opportunities in rural areas, landowners rely on their land for income stability. Landowners are more likely to protect their land and their families into the future.

The second contractual variable (TRANSFER) has a negative relationship with interest. This suggests that landowners are not keen to the idea of allowing another agency to hold a deed to their land. Policymakers may want to consider making transferability optional for landowners when requested.

The variable (AGE1) has a negative relationship with landowner interest. This suggests that landowners are less likely to be interested in entering into a CE agreement. Younger adults tend to take more risks and adopt newer technologies. Furthermore, older landowners may not have the means to take the risk of a new conservation method.

Education has a positive relationship with landowner interest. Educated people with more knowledge of current agricultural issues and opportunities may be more likely to be interested in the easement method of conservation.

The variables FFA, ESTATE, SPRAWL, ENVE, TIME, GENDER, ACRES1, and INCOME are not statistically significant. The negative coefficient of FFA suggests that FFA CE workshop attendees have attended workshops and have decided against CEs or need more information. The negative coefficient of ESTATE suggests that landowners more interested in lowering estate taxes are less interested in entering into CE agreements. This may not be an option they are interested in considering to help lower their estate taxes. The positive coefficient on SPRAWL suggests that those landowners interested in curbing urban sprawl are more likely to be interested in the CE. The negative coefficient on ENVT indicates that those landowners with interest in CEs due to preserving the environment are less likely to be interested in the CE. These landowners may be more interested in other means of preservation such as full fee purchases or zoning laws. The positive coefficient of TIME suggests those with a positive influence from the time needed to learn about and negotiate CEs are more interested in conserving the CE. Although this result seems somewhat counter intuitive, the logic for this observation may be due to the willingness of landowners interested in utilizing the CE as a means to conserve their lands to take the time to learn about the topic and negotiate proper prices. The positive coefficient on GENDER demonstrates that male respondents are more interested in the CE. The positive influence on ACRES1 indicates that landowners with a larger land base are more interested in the CE. The positive coefficient on income indicates that landowners with a greater income are more interested in utilizing the CE. Whereas this went against *a priori* expectation, income may be related to education and those landowners with more education, therefore generating larger incomes, may be more aware and comfortable entering into a CE agreement.

The marginal effects are presented in Table 3.7. The marginal effects column shows the probability of being interested in a CE in response to a unit change in the mean value of an explanatory variable. For example, a respondent whose age increases one year will be 0.4% less likely to be interested in a CE. Similarly, the payment variable has a marginal effect of 0.554 indicating that respondents with positive influence from the payment incentive will be 55.4% more likely to be interested in a CE agreement.

Table 3.7 Regression Results for Logit Model Describing Landowner Interest

Variable	Coefficient	Std. Error	Marginal Effects
PAYMENT	**2.86	1.15	0.55
FFA	-0.18	0.32	-0.04
MANAGEME	**-0.86	0.32	-0.20
ESTATE	-0.11	1.19	0.03
SPRAWL	0.61	0.56	0.15
ENVT	-0.31	0.96	-0.07
CURRENT	**1.32	0.66	0.32
PERPETUITY	**1.23	0.30	0.29
TRANSFER	**-0.63	0.32	-0.15
TIME	0.36	0.33	0.09
GENDER	0.42	0.34	0.10
AGE	*-0.20	0.01	-0.004
ACRES	0.11	0.00	0.00
EDUCATE	**0.90	0.40	0.22
INCOME	0.31	0.06	0.01
Chi-Squared	90.89		
McFaddenR ²	0.22		
LR Test	-165.53		
# Predicted Correct	87.20		

**p<0.05, *p<0.1

Comment Section Results

Comments from an open-ended question were examined using content analysis to identify themes in responses to the statement, “Please write any questions or comments about the idea of CEs in the space below or on the back if more space is needed.”

Ninety-one comments were collected and separated into 9 categories ranging from those

comments not applicable to the survey to those comments against additional government intervention. For our analysis, four issues arose as themes identified from the survey and helpful for CE policy, shown in Table 3.8. These included positive feelings towards CE's, negative comments towards CE's, negative comments towards additional government intervention that is associated with CE, and a theme of a need for information. Comments are found in (APPENDIX H). The categories are described in the following sections.

Table 3.8 Comment Categories Generated Through Content Analysis

<u>Content Analysis Categories</u>
Positive Comments Towards Conservation Easements
Negative Comments Towards CE's
Negative Feelings Towards Government Intervention
Need for More Information

Positive Comments Towards Conservation Easements

Seventeen percent of comments were those of positive feelings toward utilizing the CE for private land conservation. Comments included, "Saving open space is important to the future," "I would like to do this to increase my income," and, "Too much of rural land has been lost already to development. What is left should be saved." Many comments supported the CE, identified the need to save land, and recognized the need to keep land free from development. Agencies should target these types of landowners as well as utilize information from this theme to advertise in brochures and mailings.

Negative Comments Towards CE's

Positive comments were matched with a negative theme against the CE. 34.6% of the responses were negative towards CE's, and included aspects such as being against the idea of perpetuity, the belief that incentives should be increased, tax stipulations, and simply being against the CE as a method of land conservation. Comments included, "I

don't like it at all!!!," "It needs a buyback feature after 25-40 years," "The price of a CE would need to be substantial to justify the loss of development rights," and, " I will agree to a CE if taxes are reduced and I can build one house (only) supplied with utilities to run a pump (well) and lighting. NO NO NO urban sprawl." This theme had a great number of negative comments as well as comments on the prevailing issue of perpetuity, which should be addressed. Education programs may need to include reasons for perpetuity, along with additional tax information.

Negative Feelings Towards Government Intervention

A third prevailing theme identified through the content analysis was the issue of negative feelings towards government intervention. 12.6% of the comments were separated into this category and included, "No government in my business," and, "I do not intend for any entity to have control over any property that I or any of my family own!" Some comments included curse words ensuring the seriousness of the feelings. Education programs may need to include sections on the extent of government intervention in monitoring as well as indicating that the easement need only entail monitoring once per year and agreeing not to develop.

Need for More Information

The last theme included that of a need for more information on the issue of CE's. Twelve point six percent of the comments were geared in this direction. The comments ranged from information needed on the subjects of the effects of the easements on future loans, statistics for individual properties, what entities manage CE's, as well as general information. Comments included, "Where would I get more information?" and "Need more information!" FFA may identify the need for more workshops working with

government, private agencies, tax specialists, and lawyers to garner up information for the landowners.

These identified themes may be useful to interested buyers to understand landowner perception and the needs of the seller.

Summary and Conclusions

Understanding landowner perception is critical to utilize the CE as a conservation strategy. This study reveals that landowner interest in the CE is driven by many factors. The results show that socioeconomic factors influence CE interest. Specifically, education increases interest in the CE agreement while the transferability of the deed decreases interest. Critical drivers are the cost/benefits of CEs. The payment incentive and the ability the CE allows for keeping land in its current use each increase interest in the CE. The management cost decreases interest in a CE. The environmental variables were not significant in influencing landowner interest. Therefore policy aimed at attracting landowners to the CE method of land conservation should recognize the significant cost/benefits factors and decrease the management cost to landowners or hold back a portion of payment funding in order for the resource managers to manage the land themselves. Resource managers may also consider dismissing the transferability clause in easements where landowners are against the idea.

When comparing the three groups in this study, significantly more interested in the CE was the more rural, lower income group. This indicates that rural communities may embrace the stability, conservation, and income brought from the CE. Rural areas may be the section to target for the CE along with the wildland-urban interface for sprawl issues in Florida and the US. The comment section indicates support for CEs. However, negative feelings are also indicated as well as negative feelings towards government input

on private property rights. Also, a need for more information is indicated, which may bring the capacity for more landowners to enter into CE agreements and defray the negative attitudes towards the idea.

Land conservation methods abound, however monetary funds are limited. In order to effectively utilize the cost efficient method of the CE, landowner perception is necessary to elicit candidates and include strategic land parcels. The results suggest that policymakers must consider the cost/benefits significantly influencing landowners. Also, resource managers may target rural communities to help in their support as well as preserving natural resources and a wildland-urban interface buffer. Also, more information is needed, both for aiding in the capacity to sell CEs and to quell the negative feelings against government intervention. There is a demand for CEs from the landowner side as well as the natural resource conservation aspect. With this information, more CEs can be utilized in the future. In the next chapter I will assess the prices paid for CEs in Florida to provide information for landowners and the preservation arena.

CHAPTER 4

ASSESSING PRICES OF CONSERVATION EASEMENTS IN FLORIDA: A HEDONIC ANALYSIS.

Introduction

Recently, there is a growing preference for market-based land conservation approaches such as conservation easements (CE) and paying for public goods (Anderson and Alavalapati 2000). This creates a demand for information, from both sellers and buyers, on how land attributes, deed restrictions, and parcel quantity measures influence the price of CE agreements. This chapter attempts to provide such information by estimating the value of various land attributes and CE deed restrictions on the price of CEs in Florida. We estimate a hedonic price function to achieve this task. This approach has been used to estimate the implicit value of land attributes important for farming, environmental amenities, aesthetics, and recreation (Larkin et al. 2005).

This chapter attempts to value environment amenities of farmland, lease conditions, and parcel measurements in Florida. The open space and other environmental amenities associated with urban fringe agricultural lands, however, are unpriced public or collective goods (Beasley et al. 1986). If hedonic analyses can reveal the implicit prices of specific land attributes and their relative values, results could provide a credible alternative to traditional CE land valuation methods used to obtain an estimate of a parcel's development rights. Furthermore, implicit prices of land attributes specific to the land parcel may be obtained, as opposed to the value inferred from other incomparable CE land parcels (Larkin et al. 2005). In addition, information on the marginal contribution of

attributes to the easement value could yield valuable insights to maximize the preservation of the wildland urban interface buffer, conserving additional land in an efficient method. Also, finding that certain natural attributes, such as wetlands and upland forests, garner higher prices for CEs may influence landowners to put more land in timber or place a higher value on wetlands. Lastly, public entities as well as landowners could use this information in their CE decision-making.

The following section describes the CE hedonic price model specification as utilized in this project. The third section describes the methods and type of data. The empirical results and discussion follow. A brief summary and conclusions are provided in the final section.

Hedonic price specification

According to Plantinga and Miller (2001), CE values are determined two ways: (1) by computing the present value of the future development rents minus the agriculture rents or (2) by estimating the value of the CE from observed agricultural prices and rents. To forgo the right to future development, a landowner must be compensated for the difference between a parcel's maximum value and its value in the undeveloped agricultural use.

In order to determine the value of the undeveloped agricultural use in Florida, a hedonic analysis is conducted to determine the nonmarket values of various characteristics that define a CE agreement. The hedonic pricing method is used to estimate economic values for nonmarket goods that directly affect market prices. The basic principle of the method is the price of a marketed good as determined by its characteristics or the services it provides. We can value the individual characteristics of a

good by looking at how the price paid changes when the characteristics change (Rosen 1974).

Following Shrestha and Alavalapati (2004) in a hunting hedonic analysis model, the relationship between prices and environmental quality or quantity attributes of a good may be specified as follows,

$$P(Z) = P(z_1, \dots, z_n) \quad (1)$$

where $P(Z)$ is the implicit value for attribute z_i ($i=1, \dots, n$) and z_i can be a spatial, managerial, and/or natural attribute of CE lands. The resulting marginal implicit value can be determined as

$$P_i = \delta P(Z) / \delta z_i \quad (2)$$

When supply and demand functions are assumed to be price independent and weakly separable in z_i , quantity and/or quality attributes can be entered as exogenous variables (Rosen 1974). This would allow us to estimate the demand model using the hedonic price function specified in equation (1).

A basic CE hedonic price model can be specified as a function of CE parcel quantity measures (Q_i), natural land attributes (Z_i), and deed restrictions (R_i),

$$P = \sum \alpha_i Q_i + \sum \beta_i Z_i + \sum \gamma_i R_i + \varepsilon \quad (3)$$

where α_i , β_i , and γ_i are slope parameters to be estimated and ε is an error term assumed to be independent and normally distributed.

Lovell and Lynch (2003) found that closeness to the city, prime soil, and development pressure fetched higher easement prices. Distance to city proxies the development pressure on the land and farmers demand higher compensation when development pressure is greater (Lovell and Lynch 2003). Osgood and Sengupta (2003)

found that in valuing ranchettes in Arizona, environmental amenity measures were significantly correlated with higher ranchette prices. In general, past research indicates agricultural land values are a function of both agricultural and amenity variables (Bastian et al. 2002).

In a hunting lease hedonic model, those lands with larger parcel sizes received lower lease prices (Shrestha and Alavalapati 2002). Plantinga and Miller (2001) found that counties with higher agricultural rents have higher land values, and that higher rates of population change raise land values by increasing development rents. A wetlands hedonic analysis found that riverine wetlands and forested wetlands resulted in a significant decrease in rural land values (Reynolds and Regalado 2002). In the same study, scrub shrub wetlands increased agricultural land values. Following these studies we expect that forests and giving up restrictions will be associated with higher CE prices in Florida, however wetlands of all types aggregated are hypothesized to have a negative correlation with CEs. We also hypothesize that large acreages and greater distance to urban areas will be associated with lower CE prices.

Data

In order to estimate the hedonic pricing equation, data were collected from the Florida Water Management Districts (WMDs) as well as the Florida Geographical Data Library. Thus, these CE agreements pertain to deed restrictions purchased by the state of Florida for the benefit of the public. The variables utilized in this analysis are defined in Table 4.1. The WMDs provided the CE sales prices (PPERACRE), and corresponding acreages (TOTACRES) from 1996 to 2003. This dataset shows that \$242 million in 1996 prices has been paid for 337,779 acres of land on 51 easements. Currently, Florida has entered into 90 CE agreements. The Suwannee River WMD owns 24, the Southwest

WMD and St. John's River WMD each own 17, the Northwest Florida WMD owns 12, and the Florida Department of Environmental Protection (DEP) owns 6. The Tall Timbers Research Station and The Nature Conservancy hold 12 and 2 donated easements, respectively. Easements not included in our data are those from donations, those that do not have GIS data, and those that could not be matched with prices due to absent GIS data. Sale prices were adjusted for inflation to 1996 using the U.S. Department of Labor's Consumer Price Index. The largest amount spent on an easement was \$33.5 million for 12,800 acres; the lowest amount was \$35,000 for 167 acres. On a per acre basis, the data on the 51 CEs in this model shows that Florida has spent \$1,306. Average acreage per parcel was 6,623.

The location of each sale was determined using the data library. This GIS source provided coverage of 51 CE parcels with polygons representing all of the land uses in Florida. The location of each CE was determined by linking the parcel names from the sale data to the parcel name on the GIS data set. Parcel distance to the nearest urban center with a population of at least 100,000 (DISTCITY) was determined. The average distance to the nearest urban center was 28.9 miles, however, the distances ranged from 3.7 miles to 66.0 miles.

Land use elements listed in the GIS data library include roads, residences, upland forests, wetland forests, agriculture acreage, herbaceous acreage, and wetlands. The AG variable includes pasture and row crops. The upland forests variable (UP) includes natural forested areas as well as plantations. The wetlands variable (WETLAND) identifies natural forested wetlands, wetland areas without forests, and rivers and streams. These land use variables are measured in percentage terms, such that they sum to one for

each parcel. Upland forests were found to have the greatest mean coverage with 44%. Wetlands consisting of wetland forests, wetlands without trees, rivers, and streams averaged 34% coverage. Agriculture had an average percent cover of 15%. Descriptive statistics for all variables are shown in Table 4.2.

Water management districts provided information on the CE deed restrictions that were included in each agreement such as those relinquishing the right to log in wetlands (TIMBER), the ability to subdivide (DWELL), and the ability to prohibit private hunting (RESHUNT). The water management districts also provided information pertaining to whether the land was subject to best management practice regulations (BMP), whether silviculture could be practiced (SILV), and whether public access would be permitted (PUBACC). Hypotheses regarding the expected effect of each of these variables on CE transactions prices are also contained in Table 4.1. The explanatory variables describing a CE agreement are described in detail in the following paragraph.

Hypotheses of Explanatory Variables

Total Acres

This variable described the parcel size of the CEs and was a continuous variable. Easement price is assumed to decline with size (Lynch and Lovell 2002). It is hypothesized that larger parcels will garner a bulk rate, therefore, the total acres variable will reduce CE price.

Year

The parcel prices for CEs have been adjusted for inflation to 1996 prices, however, it is thought that payment prices have increased due to the rise in urban sprawl and the critical need for land conservation. It is thought that year will have a positive effect on CE prices.

Distance to city of 100,000 or more

DISTCITY is a continuous variable that utilizes GIS data to measure CE parcel distance to the nearest city with 100,000 or more residents. Lynch and Lovell (2002) found that the closer the parcel is to the city, the higher the easement value. Since CEs help contain urban sprawl inherent to large cities, it is expected that the price of easements closest to cities will be higher. It is hypothesized that CE price will decline as distance from the city increases.

Percent of Land in Upland Forests

Upland forests include hardwood conifer, cypress/pine/cabbage palm, oak/pine/hickory, pines, pine flatwoods, cypress, temperate hardwoods, pine plantations, and forest regeneration. These are environmental amenities sought by organizations to preserve lands through the CE. Sengupta et al. (2002) found that the presence of such environmental amenities brought increased ranchette prices. Thus, it is hypothesized that the upland forest variable will increase CE prices.

Right to Log in Wetlands

Logging in wetlands is one of the primary goals that public and private agencies want to cease. Some agencies give an incentive for ceasing logging in wetlands through the CE and pay the landowner for the timber that is not harvested. Since landowners who choose not to log receive timber payments and abandon logging, this variable is thought to increase CE prices.

Silviculture

CE deeds may allow landowners to continue logging timber. This feature may be harmful to wildlife and natural resources, even though CE deeds require best

management practices (BMP). It was hypothesized that giving up the right to practice silviculture would garner higher CE prices.

Right to Subdivide

CE deeds may allow landowners to subdivide the land parcel once or more to allow children and heirs to build homes. Subdivision may harm resources. It was hypothesized that giving up the right to subdivide would garner larger CE prices.

Right to Reserve Public and Private Hunting

CE deeds may allow landowners to lease the land for hunting. This may harm wildlife and natural resources. It was hypothesized that relinquishing the right to subdivide would garner higher CE prices.

Percent of Land Cover in Wetlands

The wetland variable includes rivers and waterways, wetland mixed forests, shrub swamp, wet flatwoods, bottomland hardwood swamp, hydric hammock, freshwater marsh, and wet prairie. As stated above, a wetlands hedonic analysis found that riverine wetlands and forested wetlands decreased rural land values (Reynolds and Regalado 2002). Even though the conservation agencies have wetland preservation goals, it was hypothesized that CE prices would be decreased by wetlands.

The model used to estimate the effect of CE variables on CE prices in the hedonic analysis is:

$$\text{PPERAC} = \beta_0 \text{TOTACRES} + \beta_1 \text{YR} + \beta_2 \text{DISTCITY} + \beta_3 \text{UP} + \beta_4 \text{TIMBER} + \beta_5 \text{SILV} + \beta_6 \text{DWELL} + \beta_7 \text{RESHUNT} + \beta_8 \text{WETLAND} + \epsilon \quad (4)$$

where PPERAC is the dependent variable, CE price per acre, and β 's are the coefficients on each explanatory variable. The error term is ϵ .

Table 4.1. Variable Definitions and Hypothesis

Variable	Ho	Definition
Dependent:		
PPERAC		Total price paid for CE indexed to 1996 prices
Explanatory:		
TOTACRES	-	Parcel size under conservation easement acres
YR	+	Dummy variable: 1 if years 2001-2003, 0 if years 1996-2000
DISTCITY	-	Distance from nearest city with 100,000 population (miles)
UP	+	Percent acreage in upland forest
TIMBER	+	Dummy variable: 1 if relinquished wetland logging rights, 0 if not
SILV	-	Dummy variable: 1 if allow silviculture practice, 0 if not
DWELL	+	Dummy variable: 1 if relinquished subdivision, 0 if not
RESHUNT	+	Dummy variable: 1 if relinquished right to hunt, 0 if not
WETLAND	-	Percent acreage in wetlands or rivers/streams

Estimation, Empirical Results, and Discussion

The implicit price for each attribute was estimated with 51 observations utilizing Limdep N-Logit version 3.0 (1998) using the variables defined and described in Table 4.1. Several diagnostics were performed to improve the accuracy of estimates. Tests for multicollinearity using a bivariate matrix were conducted. No significant correlation was found, therefore each variable was included in the model. The model was corrected for heteroscedasticity manually by programming Limdep to correct for the problem automatically. Box-Cox transformations are commonly used approach to determine the correct specification of a hedonic pricing model (Osgood 2003, Bastian et al. 2002, Larkin et al. 2005, Lynch and Nickerson 2001). Such an approach frequently supports the use of logarithmic transformations, however, this approach was not adopted for this paper since several of the explanatory variables are binary (Bastian et al. 2002). Thus, a simple linear specification was estimated.

The regression descriptive statistics are found in Table 4.2 and results are presented in Table 4.3. Two variables are statistically significant at the 5% confidence level,

including distance to nearest urban center (DISTCITY) and giving up the right to log in wetlands (TIMBER); two variables are significant at the 10% confidence level, share of land in upland forests (UP), and giving up the right to subdivide (DWELL). The R² for the model is 0.315.

Each hypothesized sign met a priori expectation. Distance to nearest city (DISTCITY) was predicted to bring the value of CE down and upland forests (UP), relinquishing the right to log in wetlands (TIMBER), and relinquishing the right to subdivide (DWELL) each met a priori expectations of raising the value of the CE. Distance to the nearest city variable (DISTCITY) with a population of 100,000 or more was shown to decrease CE prices. Increasing the distance of the CE one mile decreased the CE price by \$52, measured on a per acre basis. This is similar to the findings of Lovell and Lynch (2003) who found that closeness to the city fetched higher easement prices.

The variable indicating the percentage of land in upland forests (UP), which consists of pine, cedar and other tree plantations, is shown to raise the CE price. In particular, for each 1% increase in lands comprised of upland forests, CE prices increased \$38 per acre above the price of agriculture. This follows Osgood and Sengupta (2003) who found that environmental amenities were significant in valuing ranchette prices in Arizona. Upland forests may be positive for CE prices as they are of economic value to landowners and may be appraised with value as well as being positive for conservation of rural lands in the wildland-urban interface. However, the upland forest valuation is probably due to the rate at which that land in upland forest can be converted to development. Whereas the current method of upland forest valuation may be economic

only, this amenity is shown here to be valued, and could be included in the valuation process in the future.

In this model, two deed restrictions were found to be significant. The first involved giving up the right to log in wetland areas (TIMBER). Giving up this right brought \$2,158 more per acre. This may be due to the monetary compensation given for the value of the wetland timber given to those CE parcels purchased by Suwannee River WMD. The second involved giving up the right to subdivide (DWELL). This restriction brought \$2,011 more per acre. This may be due to the value placed on intact ecosystems. When families keep their right to subdivide, their heirs may build additional houses on the land. This may fragment the ecosystem and incentive is given for those who relinquish this right. However, resource managers and appraisers may be valuing this a different way. If landowners give up the right, resource managers currently only agree to pay the appraised price, not a higher price. If the landowner does not give up the restriction, the resource manager may not be in the position to buy the CE since it may not meet the objectives for the easement. Direct monetary incentives could be created in the future for giving up these restrictions and including them in the valuation process.

Table 4.2. Hedonic Specification Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
YR	0.00	1.00	0.31	0.47
PPERACRE	\$188.12	12051.90	1306.16	2313.89
DISTCITY	3.68miles	65.99	28.91	16.14
TOTACRES	38.56acres	41525.00	6623.12	9933.77
UP	0.00%	99.99	43.85	32.52
WETLAND	0.00%	96.52	33.96	24.60
TIMBER	0.00	1.00	0.76	0.43
DWELL	0.00	1.00	0.31	0.47
RESHUNT	0.00	1.00	0.78	0.42
SILV	0.00	1.00	0.86	0.35

Table 4.3. Hedonic Regression Results for CE Agreements in Florida¹

Variable	Coefficient	Standard Error	t-ratio
Constant	1032.71	1600.03	0.645
TOTACRES	-0.01	0.023	-0.5
YR	364.49	621.12	0.59
DISTCITY	-43.02**	19.4	-2.22
UP	19.6*	10.84	1.81
WETLAND	-7.55	9.31	-0.81
TIMBER	1950.48**	874.64	2.23
DWELL	1976.76*	990.26	1.97
RESHUNT	-64.97	565.16	-0.12
SILV	-1374.1	1367.59	-1.01
N	51		
Prob. Value	0.056		

Conclusions

Using data from state-sponsored purchases of CE agreements, a hedonic model was estimated to determine the implicit values of CE attributes in Florida. Data on the CE value are provided to help guide policy decisions and selection criteria. Results show that one natural attribute, upland forests, has a positive impact on CE prices. Two deed restrictions, giving up the right to subdivide as well as giving up the right to log in

¹ **Denotes significance at the 95% confidence level. *Denotes significance at the 90% confidence level.

wetlands, had positive impacts on CE prices. One parcel measurement characteristic, distance to nearest city with population of 100,000 or more had larger distances bringing a negative impact to the CE price. Wetlands are found to be valued negatively.

Information was found on the effects of variables describing CE agreements. Whereas appraisals are based directly on the development value of agricultural parcels, there is evidence that conservation organizations are providing incentives for those lands with forests, those that give up subdividing on the land, and those that give up logging in wetlands. There is also evidence organizations are paying higher prices for lands closer in proximity to urban centers, those that protect the wildland-urban interface. Conservation organizations may be recognizing the need to protect land in these areas at risk for urban conversion. This may also reflect higher land values closer to urban area amenities, indicating that if money is to be saved, agencies could target lands further from the interface.

With these stated preferences, restrictions, natural attributes, and location are significant when estimating the cost to preserve CE lands. This information could serve as a basis for valuing certain attributes, lease conditions, and parcel measures. Also, landowners can utilize the information. They may realize the value of these attributes on their land and be aware that they will receive incentives for these natural attributes and for allowing more restrictions in the deed agreement. This could possibly place more land in upland forests and/or create a longer rotation age of timber due to the CE amenity. Also, a value for wetlands may be initiated by incentives from agencies. If agencies are interested in landowners preserving their wetlands, a value must be placed on them. Until there is a stated incentive for asking landowners to protect their wetlands, much less

a penalization as illustrated in this study, wetlands will continue to be lost. Valuing these incentives can only help rural community stability as well as environmental stability.

Whereas current CE prices are being valued simply on the value of development rights, future appraisals may include natural amenities as well as restriction incentives. The continuation of conservation land purchases and similar programs around the U.S and county level and by land trust agencies highlights the need for such information, which could be used in cost transfer analyses (Larkin et al. 2005). Such information could reduce administration costs for counties that have recently established tax or bond-funded land conservation programs (Larkin et al. 2005). The information can also reduce negotiation time periods by allowing landowners to have more perfect knowledge on prices possible for their lands. Also, these results can be used in future models with measures of amenity benefits to determine the optimal number of acres and the most cost-effective locations for which to target conservation areas (Lynch and Lovell 2002).

Caveats exist in this model. The explanatory power of the model was relatively low, however, this study provides a CE framework for Florida. A larger data set with additional variables like agriculture rents and prime soils may bring a more accurate estimate of public land value.

Further research may include gathering additional data points for CE in Florida as well as data points in the South and the nation. Gathering this data along with adding further variables may garner a more explanatory model as well as more significant illustrative variables. Also, more information on landowner perception may allow administrators to pursue more CEs, and ultimately expand buffer lands in the wildland-urban interface. Florida officials may also want to research the effects and possibility of

incorporating the point system utilized by Maryland preservation programs to efficiently and equally value CE parcels in the future. These programs assign a distinctively unique price for each natural attribute, location, and deed restriction. This aids the landowner in knowing what price to seek as well as aiding the administration to be efficient in targeting and valuing lands. Research and efficiency will lead to larger areas of conservation and less loss of urban space and natural resources in the wildland-urban interface.

CHAPTER 5

SUMMARY AND POLICY IMPLICATIONS

Florida has unique urban sprawl issues with an estimated nine hundred people born or immigrating to the state each day. With significant farmland loss in the state, sustaining rural lands is a growing ambition. With rising awareness that these areas protect vital ecosystem functions, these lands are needed to protect a buffer between the wildland-urban interface. With conservation agencies leaning more on the CE as a method of preserving WUI areas, this project aims to add to the literature on this method in order to provide information to policy makers, public and private conservation organizations, and private landowners.

First, landowner perception was analyzed. The results indicate an interest in more CE information as well as interest in entering into CE agreements. The results illustrate significant differences in Alachua County, Gilchrist County, and Florida Forestry Association (FFA) opinion. Landowners in Gilchrist County were found to be more familiar with CE agreements, more interested in additional information on the topic, and more interested in entering into CE agreements. Gilchrist County is also significantly more interested in the payment from a CE agreement, preserving their land into perpetuity, keeping their land in its current use, and utilizing the CE to preserve the environment. Rural lands may be prime areas to target for both willing landowners and the chances to conserve natural resources while strengthening rural communities.

A logit regression analysis was also performed to determine the effects of variables on landowner interest in entering into a CE agreement. The results show that

cost/benefits issues are central to landowner interest in entering into CE agreements.

Policymakers must keep in mind the cost/benefits issues of landowners when considering owner friendly CE policy. Considering these issues may accommodate more landowners, and in turn place more land in preservation by this method. Respondent comments highlighted the need for more information on easements and a need to address the negative attitude towards additional government intervention. Addressing the need for information and the concerns with government encroaching on landowner rights may help lower a barrier to CE land conservation.

The hedonic analysis indicates that upland forests, as well as giving up the rights to log in wetlands and subdivide, garner higher easement prices. Also, those lands near urban centers are acquiring higher easement prices. Also significant to note is the negative value placed on wetlands. Whereas CE parcels in Florida are valued by their development rights only, future valuation of natural amenities can be appraised. In this way, landowners on private lands will have an incentive to value natural amenities. At this point, with no reward for actually valuing the upland forests, and being penalized for having wetlands on the property, there is no incentive for proper land stewardship. Whereas current appraisal methods value development rights only, the information in the study can be utilized as a basis for this new valuation and can also help landowners to be more equipped to bargain during future negotiation processes.

Landowner perception and market development of the CE is imperative for continuing with and increasing the use of CEs as a means to conserve agricultural lands in Florida. With funding being a limiting factor, acquiring landowner perception information as well as pricing information may help reduce negotiation time and help to

efficiently value and target potential lands for CEs. It is hoped that landowners may take notice of the monetary incentives of putting more land in upland forest cover as well as giving up subdividing and logging in wetlands. This is one way that the wildland-urban interface lands and natural resources may be slowly preserved as well as restored.

Further CE research is needed to prioritize and target prime lands for CE preservation in Florida as well as to determine the cost to preserve these lands. Also, additional parcels may be added to the hedonic study throughout Florida and the south to develop and increase understanding of CE pricing. More understanding of the CE will provide more information for the decision making process in the future.

APPENDIX A

CE LANDOWNER SURVEY

Section 1: Conservation Easements

1. Before reading this questionnaire, how familiar were you with the term "conservation easement"? (Please check one)

- Very familiar
 Somewhat familiar
 Somewhat unfamiliar
 Very unfamiliar

2. Have you ever been asked to consider selling a conservation easement on land you own?

- Yes No

3. Have you ever sold a conservation easement on any part of land you own in Florida?

- Yes No

Now we will ask you to read the text below then answer the questions that follow.

A **conservation easement** (CE), is a voluntary legal agreement wherein a landowner agrees not to build houses, apartments, shopping malls, etc. (i.e., not to develop the land in a specific way) over a specified period of time in exchange for a payment and/or tax benefits. Like conservation land purchase programs, CEs preserve environmental quality and control urban sprawl. However, CEs are preferred over land purchases by conservation agencies since they cost less (since only the rights and not the land are being purchased) and lands do not need to be managed by the agency.

CES are ideal for landowners that want to keep land in its current use (e.g., farming, ranching, recreation, forestry). This is because they do not want to develop their land anyway, and are getting paid. On the other hand, CES are not appropriate for landowners that desire flexibility in terms of future use of their land. This is because CES restrict land use (particularly for potentially high-valued development) and require periodic monitoring for compliance (i.e., land remains undeveloped).

The characteristics of CE agreements include:

- In Florida, CE agreements in perpetuity meaning they last forever. That is, they are not short-term arrangements and cannot be discontinued. Once a CE agreement is established, the information is included on the deed and the land can never be developed.
- CE agreements lower estate and property taxes.
- CE agreements are transferable assets so they can be transferred. For example, if you sell a CE to the State of Florida, the state has the option to transfer ownership to another organization (e.g., The Florida Land Trust). The owner of the CE has the right and responsibility to ensure that you do not violate the terms of your agreement.
- CE prices typically range from 25% to 75% of the current land value.

4. Having gone through the information provided in the box above, how interested are you in learning more about Conservation Easements?

- Very Interested
 Somewhat Interested
 Not Interested

5. We would like to know how each of the following factors influence your decision as to whether or not you would enter into a CE agreement. Please read and circle one number for each of the following questions.

	Very Negative Influence	Negative Influence	No Influence	Positive Influence	Very Positive Influence
a. A payment received for selling a CE.	1	2	(3)	4	5
b. Rural community stability associated with CEs.	1	(2)	3	4	5
c. Estate tax deductions associated with CEs.	1	2	(3)	4	5
d. Urban sprawl prevention associated with CEs.	1	(2)	3	4	5
e. Estate tax deductions for heirs.	1	2	(3)	4	5
f. Environmental services (air & water quality and biodiversity) associated with CEs.	1	2	(3)	4	5
g. Additional management costs associated with CE.	1	(2)	3	4	5
h. Provision for owner of CE (agency CE was sold to) to visit your land periodically for monitoring purposes.	(1)	2	3	4	5
i. Extra time commitment associated with learning about, negotiating, and finalizing CE agreement.	(1)	2	3	4	5
j. Legal fees associated with CE agreement.	(1)	2	(X)	4	5
k. Property tax deduction associated with CEs.	1	2	(3)	4	5
l. Ability to keep the land in its current use.	1	2	(3)	4	5
m. Perpetual (forever) nature of conservation easements.	(1)	2	(3)	4	5
n. Provision for one land trust to transfer its CE agreement to another land trust.	(1)	2	3	4	5

6. If you had the opportunity, how interested would you be in entering into a conservation easement agreement on parcels of your land (Please check one box)?

- Very Highly Interested Somewhat Interested
 Highly Interested Not Interested
 Moderately Interested

Section 2: Participant Information

We would like to ask a few questions about you and your background. This information will be used for statistical analysis only, in combination with all respondents, and all information will remain strictly confidential.

1. Are you (circle one): Male or Female

2. In what year were you born: 1949
3. How long have you lived in Florida? 30 Years
4. In which county do you live (Please Write)? Alachua
5. How many total acres do you own in Alachua and/or Gilchrist Counties combined?

Total Acres 223

6. How long have you (or your organization) owned land?

- Less than 1 year 11 through 25 years
 1 through 5 years 26 through 50 years
 6 through 10 years Over 50 years

7. What is the dominant land use of your land? (Please check only one box.)

- Timber Recreation
 Agricultural Crops Other
 Ranching Dairy

8. Please circle the number corresponding to your highest level of education:

1 Elementary School	2 Middle School	3 High School	4 College or Technical School	5 Graduate or Professional School
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9. Please indicate the range of your total 2003 gross (Pre-tax) income? (Please check a box.)

- Less than \$15,000 \$45,001 to \$55,000 \$75,001 to \$85,000
 \$15,000 to \$25,000 55,001 to \$65,000 \$85,001 to \$95,000
 \$25,001 to \$35,000 \$65,001 to \$75,000 More than \$95,000
 \$35,001 to \$45,000

10. How would you describe the land ownership of your organization? (Please check a box.)

- Industry Non Profit
 Small Business (LLC) Absentee
 Private Non-industrial Other _____

Thank you for your help with this study! Please write any questions or comments about the idea of Conservation Easements and/or the process of Conservation Easements in the space below or on the back if more space is needed.

Comments:

Please place this survey in the enclosed postage paid envelope. 
 Thank you!

APPENDIX B PRE-SURVEY POSTCARD

January 13, 2003

Last week a questionnaire seeking your opinions about conservation easements was mailed to you. Your name was drawn randomly from a property appraisal list.

If you have already completed and returned the questionnaire to us, please accept our sincere thanks. If not, please do so today. We are especially grateful for your help because it is only by asking people like you to share your input that we can modify conservation easement policy to help landowners in the future.

If you did not receive a questionnaire, or if it was misplaced, please call us at 1-352-846-0902 or email us at tmashour@ufl.edu, janaki@ufl.edu and we will get another one in the mail to you today.

Terri Mashour, Graduate Student
School of Forest Resources and Conservation
University of Florida
Gainesville, FL 32601

APPENDIX C
COVERLETTER FOR INITIAL MAILING



School of Forest Resources and Conservation 118 Newins-Ziegler Hall
PO Box 110410
Gainesville, FL 32611-0410
www.ssrc.ufl.edu

January 26, 2004

Dear Florida Landowner:

I am writing to ask for your help in a research study that we are conducting at the University of Florida. We have selected a few landowners, randomly, to find out their perceptions and attitudes towards conservation easements. You are one of them and ***your response is very important.***

Your responses are confidential to the extent provided by law. When you return your completed questionnaire, your name will be deleted from the mailing list and never connected to your answers in any way. When completed, please return your questionnaire in the enclosed postage paid envelope. There is no compensation for this survey. This survey should take about 15 minutes and is voluntary. You do not have to answer any question you do not wish to answer. You are free to withdraw your consent and to discontinue participation at any time without consequence. There are no anticipated risks associated with this study. For some reason, if you prefer not to respond, please let us know by returning the blank questionnaire in the enclosed stamped envelope.

We hope that the results of this study would provide valuable information for state and local governments and help them address landowners' concerns related to conservation easements. If you have any questions or comments about this study, we would be happy to talk with you. Our number is 1-352-846-0899, or you can write us at the address on the letterhead, or you can email us at janaki@ufl.edu or tmashour@ufl.edu. Questions or concerns about the research participants' rights can be directed to the UFIRB office, Box 112250, University of Florida, Gainesville, FL, 32611-2250.

Thank you very much for helping with this important study.

Sincerely,

Janaki Alavalapati

Equal Opportunity/Affirmative Action Institution

Associate Professor
University of Florida

P.S. Thank you again for taking 15 minutes to fill out this conservation easement survey! Even if you have not yet heard of conservation easements it will help us find out how to improve policy to make landowners more aware and understanding of the possible benefits available for Florida land and rural areas in the near future.

APPENDIX D POST SURVEY POSTCARD

March 4, 2004

Dear Landowner:

Last week a questionnaire study seeking your opinions about conservation easements was mailed to you. Your name was drawn randomly from a property appraisal list.

If you have already completed and returned the questionnaire to us, please accept our sincere thanks. If not, please do so today. We are especially grateful for your help because it is only by asking people like you to share your input that we can understand conservation easements and rural land conservation.

If you did not receive a questionnaire, or if it was misplaced, please call us at 1-352-846-0902 or email us at tmashour@ufl.edu, janaki@ufl.edu and we will get another one in the mail to you today.

Janaki R. R. Alavalapati, Associate Professor
School of Forest Resources and Conservation
University of Florida
PO Box 110410
Gainesville, FL 32611-0410

APPENDIX E
COVERLETTER FOR SECOND MAILING

**UNIVERSITY OF
FLORIDA**

I F A S

School of Forest Resources and Conservation 118 Newins-Ziegler Hall
PO Box 110410
Gainesville, FL 32611-0410
www.ssrc.ufl.edu

March 24, 2004

Dear Landowner:

About 4 weeks ago I sent a questionnaire to you that asked about your opinions of conservation easements. To the best of our knowledge, it's not yet been returned.

The comments of people who have already responded include positive, negative and neutral opinions of conservation easements. It is only by hearing from nearly everyone in the sample that we can be sure that the results are truly representative. Therefore, I request you to complete the enclosed survey and return it to me as soon as possible.

Your responses are confidential to the extent provided by law. When you return your completed questionnaire, your name will be deleted from the mailing list and never connected to your answers in any way. When completed, please return your questionnaire in the enclosed postage paid envelope. There is no compensation for this survey. This survey should take about 15 minutes and is voluntary. You do not have to answer any question you do not wish to answer. You are free to withdraw your consent and to discontinue participation at any time without consequence. There are no anticipated risks associated with this study. For some reason, if you prefer not to respond, please let us know by returning the blank questionnaire in the enclosed stamped envelope.

We hope that you will fill out and return the questionnaire soon, but if for any reason you prefer not to answer it, please let us know by returning a note or blank questionnaire in the enclosed envelope. If you have any questions or comments about this study, we would be happy to talk with you. Our number is 1-352-846-0902, or you can write us at the address on the letterhead, or you can email us at janaki@ufl.edu or tmashour@ufl.edu.

Thank you very much for helping with this important study.

Sincerely,

Janaki Alavalapati
Associate Professor
University of Florida

P.S. Thank you again for taking 15 minutes to fill out this conservation easement survey! Even if you have not yet heard of conservation easements or are not eligible, it will help us find out how to change policy to make you more aware and help you obtain the benefits available for your land in the near future.

APPENDIX F OPENENDED QUESTION COMMENTS

General Comments

My residence is on this land.

I had approached an agency in Gainesville last year offering my land, but was turned down. I am currently going thru re-zoning of my land for a subdivision for economic reasons!

Land is being sold

This land is leased to hunters, not for sale.

Currently we have our land for sale--so my answers are affected by this transaction in the making.

This land has been in family for about 90 years. Hope it stays that way for next 90.

It is excellent for large landowners-N/A for a unit my size.

My farm has a conservation easement on it. It was there when I bought the land.

Too many private questions.

I sold my land in Columbia county 4/11/04

I prefer not to answer questions about unfamiliar topics.

I own 1/4 interest in land, my sister owns 1/4, my mother owns 1/2.

Response may be somewhat confusing because I inherited 1/2 interest on a CE. I would hope to see the results of this survey.

For Plumb Creek, not individual.

I am a county forester for the FL DOF. I own no property.

Against Conservation Easements

I will agree to a CE if taxes are reduced and I can build one house (only) supplied with utilities to run pump (well) and lighting. NO NO NO urban sprawl.

First page "CE prices range from 25%-75% of the current land value." It is my opinion that CE prices should be 100% of the current land value. When you cannot build on a large tract of land, the value drops. Julie Ravenport, a Florida Farm Credit appraiser, said at an Alachua County Commission meeting, that a conservation easement has no loan value.

Against Conservation Easements: Against Government

The placement of land in CE's takes land out of tax rolls thus increasing taxes on other taxpayers. Each landowner is a steward of his property. This is a gross infringement on owner rights. Too much qov. or quasi qov. control of property. This smells of socialistic tendencies!

No Government in my business

I do not intend for any entity to have control of any property that I own! Or any of my family own.

Taxpayers pay for CE's, their management and resulting increase in government. We don't need more government. This area is going to be all residential. Private individuals generally are smart enough to create desirable easements without interference from politicians or others.

The concept involves too much bureaucracy. Availability of funding for concept is uncertain.

Do not think government should get involved in controlling a person's hard earned land. This is supposed to be America, home of the free.

The state and county have not f clue as to what they are doing. No one seems to know what he or she is doing. Total confusion. Typical government clusterf.

Government (local, state and federal) own enough land for their needs now and in the foreseeable future. I see this as another way that government is taking away rights of its citizens. People should think very seriously before entering into this agreement. This is not a novel concept of the government to take away rights by paying for them with tax dollars, just an unusual up front approach.

There should be no tax on homes or land after they are paid for. Too many people and organizations already have too much say over how a private landowner manages the property he paid for, pays taxes on, and owns.

I would not be interested in selling any to the state. Within the last 5 years I sold about 36 acres to them-rock gottom prices they paid and it took forever to get the deal finished.

I would never be interested in giving any government organization that much control over my property!

Not interested in anyone controlling my use of my land!

This is an environmental consultant that has used easements for clients.

I am involved with conservation easements as a lender, not as a landowner. In Levy County only a select few (Georgia Pacific, Man, Meeks and Drummond) have been able to sell a CE on their land. The lands were not suitable for development because most were wither wetlands or prone to annual flooding. The public's money was transferred into private hands in an amount exceeding the total market value of the lands and multiple times the present market value of the development rights. Conservation easements are all about transferring wealth. Please investigate the above named transactions and see what you think.

I don't like it at all!!!

I will never agree to a conservation easement because of the efforts of Alachua County to restrict and diminish my rights of ownership to use all my land for agricultural purposes. Alachua County Environmental Protection practices selective enforcement in my opinion and in my opinion does not recognize the reasonable use of property and the ability to protect water and to reduce natural water runoff. Property taxes have to continue to be paid even though there is no income and no use of the property. No property is valued at \$0/acre.

We considered a conservation easement at one time, but were told that we would have to fence the cattle away from their watering areas. There were other restrictions that would have made cattle ranching very difficult. Therefore it was not feasible for us to pursue a C.E.

Someone who obviously thinks that CEs are a good idea prepared this questionnaire, and the questions slant toward perceived benefits, not negative implications, such as private property rights, highest and best use, taking RE? (Land?) of the tax roles, etc.

Most land that CE's are purchased on can't be developed so leave them on the rolls.

Its way past time this kind of effort can reveal its best use. I am not interested in having any kind of restrictions on my land.

The price of a CE would need to be very substantial to justify the loss of development rights.

The state seems unwilling or unable to pay enough for conservation easements.

Not interested, thank you.

Although I don't anticipate doing it, I don't want to lose the ability to subdivide a portion of my land, if need be.

Against Conservation Easements: Against Perpetual Nature

Since a CE is permanent, there's no point in an answer to number 5 since I've willed the property to someone who will probably just sell it.

The CE agreement should only be effective for as long as I own property. If I choose to sell, the CE agreement should be null and void upon my request at sale. If during my ownership, I decide to rezone, I should have the right to do with property, as I so desire, within environmental and legal laws. A CE may be voluntary as an owner's right to say yay or nay, but this is the country commission's secondary plan, since they were shut down a year ago with their larger "taking" of private rural properties from owners.

From Attached Letter: We have been approached about conservation easements, but have thus far rejected any attempts to place a conservation easement on the property. While conservation easements certainly work for many people, they do not work for everyone. We have long advocated less than perpetual conservation easements, but there are currently no programs that provide adequate compensation for such arrangements. Will give more information on legal fees incurred by landowners.

Length of commitment versus expense of purchase versus restricted forever use do not weigh out in favor of doing. No benefit of value to me to restrict the use of land forever without sizeable return on investment. This program does not meet that requirement when I can leave in trust and designate it's future for good of wildlife on nature without loss of control.

From reading the included material describing the program the thing that is least appealing is the lack of a plan for 10-20-30 years instead of the only option of the easement being forever. I hope our property continues to be a working farm forever, but sometimes circumstances dictate other actions. My name is Jerry Waters and my number is 352-475-3338. Please contact me if you have any questions.

I would be glad to sell a conservation easement for 30 years or so, but not forever!

CE can be for less than perpetuity and can allow or disallow almost anything. Look at some of the central FL CE with the water management district allowing homes and future

permitting for future houses. Urban sprawl will just jump over CE areas and attract development in some cases due to the desire to have a CE for a neighbor.

Forever is too long-50 or 100 years would be much more acceptable.

A time-limited conservation easement would be much more likely to appeal to me.

CE's should be looked at for possible renegotiation at 25 or 50 years.

I don't think perpetual (CE) is good for our country. I would like to see 30,40,50 years CE. What's good today may not be in 40 or 50 years. Thank you.

Forever is a long time.

It needs a buyback feature after 25-40 years.

I would be interested in short term some day, but I bought the land as an investment and I believe a CE would definitely hurt my resale value yet I believe that it is a good idea.

I am definitely not for anything that is forever. Things change.

For Conservation Easements

Too much rural land has been lost already to development. What is left should be saved. I would really be interested if the value of land is based on the current market value, not what's on the tax rolls. P.S. Kay Richardson would like to receive a survey-PO Box 42, Evinston, FL 32633

Have placed a CE on this property with ACT without compensation-donation.

Saving open space is important to the future.

Idea is great. Would have to know much more about the actual numbers for my property before agreeing to a CE.

I am 63 years old and neither of my children is interested in farming. So I don't see an advantage to myself in locking into such an agreement at this time of my life. The principle is good, but doesn't suit me.

I would like to do this to increase my income. Gave her address.

My land trust is currently negotiating a CE in Alachua County.

Conservation easements should be allowed on specific parts of a property as corridors, while still allowing development on the rest of the property. This might encourage

people who cannot afford not to develop or sell their property to still provide green space and wildlife corridors.

Inquired about CE to private and public, neither showed interest due to no imminent development. Thought CE's in the area would help preserve the rural area around the park.

This is an excellent program for landowners as well as taxpayers. (Government spending.)

Not sure these responses will be of use. Value property is for second home and family enjoyment. Too small, but somewhat environmentally sensitive. Should I own a larger acreage, remote, with environmental sensitivity, I would be interested in a CE.

My family may be interested in CE on environmentally sensitive land.

Our corporation (Usher Land and Timber, Inc.) owns one 61 ac. Tract in Gilchrist County. The Usher family had its related entities own several thousand acres in Levy, Dixie, and Gilchrist Counties. We have negotiated a conservation easement on a 2000 ac tract in Levy and plan to close later in 2004. My responses to your questions come with that background information. If you have any questions you can reach me at (352) 493-4221.

CE is an important vehicle for keeping land free from development. Process is complicated and expensive unless some of the burden is lifted by local governmental or private interest paying for some of the up front cost. I am the managing partner of a family partnership-my response is based on my personal experience and does not reflect the collective view of the partners.

I am not interested, but have no objection to CE agreement.

My apology for the oversight. Thank you for this positive influence.

There are additional management costs, but these are defrayed if you were paid enough to maintain them. This person was instigator of St. John's Land Trust, which is now North Florida Land Trust.

I am a real estate appraiser and frequently appraise land for conservation easement purposes for the state and private users.

I am actually an environmental consultant and often prepare CE's for permitting purposes as well as sales to the state. I think they are a great idea and will work for some people.

Need More Information

How does this effect 501.C3 holdings?

I would have to learn more about CE and its mechanism to understand what I would be up against. I could not fill #5 because I could not evaluate the impact.

Is payment each year or one time? Is payment on the 1000 acres or just a strip of land? Is value of land best use or agricultural?

In theory I have positive feelings about conservation easements. In actual practice, they are very restrictive. No one can foresee future events that may necessitate selling the land for development for economic reasons-my husband (Robert J. Barry to whom this questionnaire was addressed) is now deceased and neither of our children are in agriculture. I plan to continue leasing the land for cattle ranching and some agriculture during my lifetime. Upon my death, realistically, my 2 daughters will probably sell it.

Would like to know more about conservation easements.

Where would I get more info?

Please send me any other information that you have available that I might better understand who would best be benefited from this conservation easement.

There is no reference that these easements would or would not devalue land for future loans.

I had a hard time finding information on the Internet. What government agencies manage CE's? etc.

I would like to find out more about CE's as I would like to buy some property next to mine that has never been cleared (Pine and palmettos).

Need Information! 352-485-1180

Objectives of property must first be divided. A CE could help meet 2 objectives: (1) means of revenue on portion of property not suitable for intensive forestry or ag purposes (2) prevent heirs from utilizing or disposing of property in a way in which you do not approve. The negative side is that you may decide to do something in years to come that would conflict with the CE, or the property value could increase dramatically, but the price received for the CE would have remained the same.

I have been to a forestry-sponsored seminar on this subject. My perception is that a conservation easement's value is roughly 1/2 of the fair market value of the land. In my particular situation, I cannot (growing even plantation timber) make a fair market return on the remaining 1/2 value I would retain. Only when the landowner can make a fair market value return on the interest retained does it ever make economic sense. I believe that the conservation easement concept has substantial value if open to markets. Public

funds cannot make the conservation easement concept a success based on tax deductions and the marketing of environmental values.

The verdict is still out concerning the property tax deductions associated with CE's. The effect is tied to market value and what diminishment (if any) placing a C.E. on land would have.

So as to make proper use of the foregoing information, please note that I do not own land typically sought for conservation. Also, I would be interested (as would others) in knowing the results and conclusions of your survey. As such, I would respectfully suggest that future correspondence provide info as to whether the results will be published or otherwise available. Good Luck.

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BIOGRAPHICAL SKETCH

Terri Marie Mashour was born and raised in Jacksonville, FL, USA. Growing up with many generations of relatives with green thumbs instilled an awareness and appreciation for the importance of plant life and an interest in conservation. Upon graduation from the College of Charleston in 2002 with a B.S. degree in biology, she interned at the Southern Research Station, Center for Forested Wetlands Research in Charleston, SC. She joined the University of Florida in 2003 and hopes to continue studying forest economics to help in the field of conservation.