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Breaking Even? An Investigation into the Costs and Benefits of Syndicated Conservation Easements

Abstract

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LAKE FOREST COLLEGE

Senior Thesis

Breaking Even?

An Investigation into the Costs and Benefits of Syndicated Conservation Easements

by

Sandra R. Khouri

April 22, 2020

The report of the investigation undertaken as a
Senior Thesis, to carry two courses of credit in
the Department of Economics, Business, and Finance and
the Department of Philosophy

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Introduction

Project Description

Conservation Easements (CEs) are agreements between a landowner and a holder, where the landowner donates the property's development rights in order to protect ecological values of the property. Qualified CEs are eligible for an income tax deduction from the IRS, with this deduction equaling the opportunity cost of the development rights donated. However, these income tax deductions are vulnerable to abuse because they are rather generous. The goal of this project is to analyze a sample of CEs to evaluate how the benefits received compare to the value of the tax deductions given.

Specifically, there are concerns of abuse of syndicated CEs, or CEs that are donated by large limited liability companies. These CEs are believed to have the highest income tax deductions and they have been labeled as abusive tax shelters by the IRS. Society has a limited amount of resources and we do not want to incentivize behavior that underutilizes those resources for the benefit of a specific few. In this project, I apply a cost vs benefit analysis method to 61 syndicated CEs in order to determine if these CEs have a positive present value.

In addition to this analysis, I create a policy suggestion that is inspired by Thomas Hobbes' *Leviathan*. In the *Leviathan*, Hobbes describes society as an artificial person and uses an extended metaphor to analyze each aspect of a country as body parts. A natural person is instinctively able to compare costs to utility and I lay out a policy that recreates that natural process for an artificial entity. In addition to this policy, I also look at one of the key requirements of CEs, which is for them to be in perpetuity; or in other words for the restrictions placed on the property to have no end date. I use Adam Smith's *The*

Wealth of Nations as a foil for Hobbes to discuss the benefits and consequences of permanently fix a property's state into the future.

An Overview of Conservation Easements

CEs are a tool used to prevent development on specific sections of a property. Congress decides that society benefits from a property remaining as is, however, the market rewards development, so this program incentivizes landowners to preserve the property. Eligible CEs result in the property owner getting an income tax deduction equal to the appraised value of the property's development rights. This makes the property owner indifferent between developing the property to its full economic value and leaving the property as is.

CEs are an unusual form of conservation because the land is still privately owned and maintained. This results in an odd dynamic where the property is being protected from its owner. The property owner gives certain rights to the holder. The holder is commonly a land trust who visits the property annually to determine that the agreement has not been breached. If there is a breach in agreement, then the holder takes the property owner to court and attempts to enforce the agreement civilly.

A CE can protect different aspects of the property. The most common protections are scenic, ecological, and historic. For example, a restriction that prevents agriculture on land close to a body of water is ecological. A restriction that prevents cutting down trees is both ecological and scenic. And a restriction that prevents putting up a swing set is purely scenic.

Not every CE is eligible for an income tax deduction. Section 170(f)(3)(B)(iii) of the Internal Revenue Code specifically allows conservation easement contributions, or "a qualified conservation contribution" as they are called in the Code. Qualifies CEs must

satisfy at least one of the following conservation purposes: 1) preserving land for outdoor recreation or education for the general public; 2) protecting a relatively natural habitat of fish, wildlife, or plants, or a similar ecosystem; or 3) preserving open space for a significant public benefit, meaning the property provides scenic views or falls under a government conservation plan.

Options two and three are common justifications for CEs, as they do not require letting the general public onto private property like Option one does. Many CEs will be made for a combination of these two reasons. The strictest requirement for a CE to be eligible for an income tax deduction is that the CE must be written in perpetuity, meaning as long as the government is enforcing laws.

Syndicated CEs and Problems with Abuse

This project in particular will focus on syndicated CEs, or CEs donated by a large group of donors who split the income tax deduction amount their members. This decision was inspired by a number of factors, such as syndicated CEs explicitly being mentioned in the IRS “Dirty Dozen” and by the introduction of The Charitable Conservation Easement Program Integrity Act. Syndicated CEs ripe for abuse and important to study.

Adam Looney Paper

In “Charitable Contributions of Conservation Easements,” Adam Looney expresses concerns about abuses with both syndicated and non-syndicated CEs. Looney has the following worries: 1) donations are concentrated and transactions seem unrelated to benefits¹; 2) a small handful of organizations are responsible for a large majority of donations²; 3) most organizations that devise donations of easements do not report them

1 Looney, Charitable Contributions of Conservation Easements pg. 3

2 Looney, Charitable Contributions of Conservation Easements pg. 4

as gifts or revenues on their public tax returns³; and 4) donations of “partial interests” are difficult to administer⁴.

For his first concern, he claims that donations are mainly located in a few, expensive areas and income tax dollars awarded are unrelated to conservation benefits. he talks about how roughly 10 percent of the acreage under easement claims about 69 percent of all tax benefits², largely because the valuation of the easements (per transaction or on a per-acre basis) is unusually high. He believes that large real estate developments in high-cost areas tend to receive the largest amount of income tax deductions.

For his second concern, he points out “between 2010 and 2012, 25 organizations (of about 1,700 land trusts nationwide) received about half of all donations of easements, measured in dollar value².” He states that he has trust in some of the larger, transparent land trusts, however many of these 25 organizations have" few employees and scarce management or enforcement resources."

He goes on to express concern about the lack of transparency, saying that these organizations report the value of these donations at zero and if they did report the appraised value of the CE as a gift, several land trusts would "rank among the nation's 100 largest, non-hospital, non-university charitable organizations²."

Looney’s final concern is that CEs themselves are particularly prone to abuse because CEs are unusual because the donation of CE only transfers some rights and not all rights. Taxpayers and the IRS argue over the method on how to value the potential lost

3 Looney, Charitable Contributions of Conservation Easements pg. 5

4 Looney, Charitable Contributions of Conservation Easements pg. 6

on a property. This leads to an attempt at an estimation of value and "some donations of easements benefit[ing] donors more than they further conservation causes⁵."

Specifically, on syndicated CEs, Looney claims that syndications are being promoted as an easy way to profit. He analyzes two sets of promotional materials which advertise syndicated CEs. The first is targeted to "landowners, developers, accountants, attorneys, appraisers, land-use consultants, financial planners, and wildlife resource managers" with the purpose of turning the easement into a source of asset liquidation. The second document provides an example of the most commonly offered benefit for those who buy into this plan, a substantial return in the form of a deduction for further investments in other real estate. Investors are offered to buy one of 99 lots for just \$36,000 and are promised a return of \$158,000 in charitable deductions⁵. In total the 99 lots would result in \$15.6 million in tax deductions for only \$3.6 million worth of land.

In order to address some of these issues Looney offers multiple solutions such as a mandatory increase in reporting and the implementation of a stronger definition to "conservation value." To increase transparency, Looney wants land trusts to be required to report the monetary value of CEs to their public tax record. He also suggests increasing minimum standards for what constitutes a valid CE to increase public benefit.

These are fairly straightforward suggestions; however, others are more radical. He suggests requiring CEs to be preapproved by an outside board before any tax awards can be granted⁶. He also suggests implementing a new system where land trusts receive tax credits that they can award to land trusts. This would solve the issue of land trusts placing CEs on properties with low ecological value because land trusts would be responsible for budgeting their credits responsibly. And even if a CE is placed, Looney does not want

⁵ Looney, Charitable Contributions of Conservation Easements pg. 21

landowners to be awarded the full market value of their development rights. “Donors could receive credits of up to a maximum of 50 percent of the fair market value of the contributed easement and could use the credits to offset up to 100% of their income tax liability.”

Government Attention to Syndicated Conservation CEs

The IRS releases an annual list of tax scams for consumers to be wary of called the “Dirty Dozen.” For multiple years the IRS has warned consumers to be careful with abusive tax shelters, however, in 2019 the IRS added language in the abusive tax shelter section explicitly mentioning syndicated CEs as an example.

Abusive Tax Shelters: Abusive tax structures including trusts and syndicated conservation easements are sometimes used to avoid paying taxes. The IRS is committed to stopping complex tax avoidance schemes and the people who create and sell them. The vast majority of taxpayers pay their fair share, and everyone should be on the lookout for people peddling tax shelters that sound too good to be true. When in doubt, taxpayers should seek an independent opinion regarding complex products they are offered (IRS “Dirty Dozen” 2019)

Syndicated CEs are a recognized problem; however, it is a problem that the government is working to address. On March 29th, 2019 The Charitable Conservation Easement Program Integrity Act of 2019⁷ was introduced in The House of Representatives and then referred to the House’s Ways and Means Committee. This bill aims amend the IRS code to limit the amount of the income tax deduction to 2.5 times “the partner's adjusted basis in the partnership” for the first 3 taxable years after the individual joins the partnership.

Representative Mike Thompson of California introduced this bill for himself and for Representative Mike Kelley of Pennsylvania. This bill has bipartisan support as

⁶ This is already done in some states, however, Looney is suggesting implementing this nation wide.

⁷ U.S. Congress, House, Charitable Conservation Easement Program Integrity Act of 2019, HR1992, 116th Cong., 1st sess., introduced in House March 29, 2019

Thompson is a Democrat and Kelley is a Republican. 27 other representatives cosponsored this bill, with 22 being democrats and 5 being republicans. As of writing, the last representative to cosponsor did so on March 12th, 2020. However, this bill has been introduced in 2017⁸ and in 2018⁹ by these same two representatives with no success, so while an interesting solution, it is debatable that this will have any impact.

Solutions

This bill will help limit the damage done by syndicated CEs, however, it seems like an attempt to put a bandage on the problem rather than treat the underlying wound. Looney's suggestions have some flaws, however, he is thinking about this the right way. The current policy is not working and is ripe for abuse. However, I do not believe that abuse is the only problem we should be focusing on. We need a policy that results in society getting the benefits that it is paying for and that prevents us from overpaying for low value CEs.

The reason that I do not like Looney's suggestion of implementing a tax credit system for land trusts to budget CEs is because it will result in great properties not getting protected because of a budgeting constraint. He does not solve the underlying problems that make CEs a bad investment for society. An investment is bad for society when we overpay for the benefits we receive. In the case of CEs, it is particularly easy to make a bad investment because the value is difficult to conceptualize. The cost to society is determined by the market value of the property, which is easy to quantify, and the benefit is the ecological value, which is difficult to quantify. In order to ensure society is

8 U.S. Congress, House, Charitable Conservation Easement Program Integrity Act of 2017, HR4459, 115th Cong., 1st sess., introduced in House November 28, 2017

9 U.S. Congress. Senate. Charitable Conservation Easement Program Integrity Act of 2018. S. 2436. 115th Cong., 2d sess. Introduced in Senate February 15, 2018.

benefiting from the placement of a CE, we need a method to compare these differences in value to ensure a fair exchange.

Philosophy and Policy

The current policies around CEs ignore the weight of permanently fixing something into the future. CEs are written in perpetuity, meaning there is no undoing the transaction and almost no method for amending the restrictions. As a result, I aim to create a policy which proactively addresses the issues CEs face because there is no possible method for retroactively addressing them.

Hobbes¹⁰ is a fitting philosopher to use to analyze CEs because CEs attempt to prevent unwanted change the same way Hobbes' *Leviathan* uses the sovereign to fix the commonwealth into its current place. Hobbes would be sympathetic to CEs as a project and I believe using Hobbes to analyze CEs can teach us some lessons on how to improve the policy.

Summary of Hobbes

Artificial Personhood

Artificial personhood is the basis for all of Hobbes' project since he views the Leviathan, an artificial person, as the basis for fixing the future into a state of peace. In Chapter XVI, Hobbes distinguishes between a natural and an artificial person: "When they are considered as his owne, then is he called a Naturall Person: And when they are considered as representing the words and actions of an other, then is he a Feigned or Artificiall person¹¹." Artificial persons have the authority to act on behalf of those they represent, while a natural person simply represents himself. The Leviathan is an artificial person that represents members of the commonwealth, so it has the ability to act on society's behalf.

10 Hobbes would be most concerned with defining who the sovereign is and where their authority comes from rather than analyzing a specific part of the government's structure, however, my project focuses on using Hobbes as a practical application for solving the policy issues concerning CEs.

11 Hobbes Chapter XVI, Person Naturall, And Artificiall

Hobbes' Account of The Will

Both the natural and artificial person need a will in order to have the ability to act. In Chapter VI Hobbes gives his definition for what the will is. Hobbes describes the will as an end to Deliberation and he says that “Beasts that have Deliberation must necessarily also have Will.” He describes deliberation as a state of back and forth decision making over a choice where “sometimes we have an Appetite to it, sometimes an Aversion from it; sometimes Hope to be able to do it; sometimes Despaire, or Feare to attempt it¹².”

When making a choice people often go back and forth on what choice they are going to make; they get stuck on the pros and cons and get caught in a loop in this deliberation period. Hobbes defines the will as the cutoff to this deliberation period, or “in Deliberation, the last Appetite, or Aversion, immediately adhaering to the action, or to the omission thereof¹³.”

Say you were stuck on whether or not to accept a new job offer. When you are deliberating you will be examining the pros and cons: the pay at this job is higher than your current job, but you want to be loyal to the job you have had for so long, but this new opportunity affords you better benefits, but what about the opportunities you currently have, etc., etc., etc. The will is the cutoff point and the decision you end up making: the new job asks you to decide by a certain period and you turn it down. You ended your deliberation and you end on the last choice you were deliberating on, not taking the job.

This account of the will is important to Hobbes because the Sovereign is the Leviathan's will. Since the Leviathan is an artificial person, it cannot act without a brain

12 Hobbes Chapter VI, Pleasures Of Sense; Pleasures Of The Mind; Joy Paine Griefe

13 Hobbes Chapter VI, The Will

of sorts. The Sovereign fills that role and acts for the commonwealth. The Sovereign can react to change, make new decisions, and hedge our bets to stay out of the state of nature.

Fixing the Future into Place

Hobbes is someone who would be sympathetic to CEs because his entire goal in the Leviathan is to fix the future into a position that is better than the state of nature. He has seen what the state of nature is like and how people are when they are at war with one another; the Leviathan is his solution to escape that state and to keep the future fixed in a way where society continues to avoid returning to it.

As a contractarian, Hobbes uses contracts to fix the future. In Chapter XIV, Hobbes defines a contract as “the mutual transferring of Right¹⁴.” Contracts can address a current transaction or a future one, where one party fulfills their end of the bargain now and the other follows through on their end at a later date.

Contracts by their nature are artificial bonds where individuals promise to stick with the original agreement. In nature, people break promises. If I enter into a contract with someone else and they already fulfilled their end of the bargain, I am capable of walking away and breaking my promise. If I did that, I would be a fool to Hobbes because I would be putting the entire enterprise at risk for my own short-term benefit. If everyone starts to break their contracts, then all of society falls and we revisit the war of all against all.

Part I: CEs and the Future

The main focus on this project will be parts II and III on the valuation issues, however, Hobbes, would be more concerned with the perpetuity question over the valuation question. Hobbes’ goal is to fix the present state of peace into place for the future so that we do not return to the war of all against all. CEs serve as an example of

what the weaknesses of a permanent and inflexible restriction into the future can look like.

The valuation question is a straightforward application of Hobbes' logic and utilizes the strengths of his thinking to untie our hands around the current policy. Since this policy is artificial, the sovereign can change it whenever in order to ensure the desired outcome is achieved. However, the perpetuity question will limit our options for land use into the future, so whatever decision we make in the present has to be a bet we are confident on in every set of circumstances. That likely is an impossible task and we need to look for tools to adapt to changing conditions to increase our odds of success.

How CEs Fix the Future into Place

CEs are contracts where the IRS pays immediately in income tax deductions and the property owner pays over time by permanently losing the ability to develop the property. What is particularly interesting about CEs, is that it is not just the original property owner that has to fulfill this contract, but every property owner after them. They are written in perpetuity, meaning the restrictions have no end date. And the IRS only pays the first property owner. If one person places a CE on her property and she moves, she does not take the CE with her; the person who purchases the property after her purchases it without the development rights.

No property owner, not the original one nor any after her, can remove this contract. The only non-disputable way, under current law, is to remove a CE from a property is through eminent domain, a power granted to the US government by the 5th amendment to take private property and convert it for public use if just compensation is awarded to the private land owner.

Eminent domain can be used to remove CE development restrictions to develop a public benefit, for example a highway. But there is something odd about needing to use a constitutional power to create a public benefit by removing a CE, which is supposed to be placed for public benefit. Perhaps this can be attributed to what the government decides people need more at the time, scenic views and nature preservation or a highway. Or perhaps there is a disconnect between the original goal of the CE, to provide public benefit by protecting nature, and the perception of CEs, as a nuisance that leaves land inefficient.

Trading off Stability for Flexibility— The Problem with Perpetuity

Hobbes aims to fix the future into place using contracts since contracts offer the most stability. For that reason, he would like the perpetuity rule because perpetuity, by its definition, leaves the CE restrictions permanent and therefore stable. There is no flexibility to adapt if the current restrictions are inefficient to fulfill society's goals¹⁵. Hobbes may potentially view the eminent domain power as enough to prevent CEs from being too limiting, however, Hobbes is willing to overpay to avoid risking an unstable future. Adam Smith serves as a great foil to Hobbes in this aspect because Smith absolutely hates limiting the potential of resources and is willing to overpay to leave room for flexibility.

In Chapter II in Smith's *The Wealth of Nations*, Smith shows us what a potential future looks like if we implement a permanent solution with no room to adjust. After the fall of the Roman empire, the region was in chaos. People were living in poverty and

15 Currently the State Attorney General can grant a change to a CE's restrictions, but that is rare.

towns were deserted. In order to protect themselves, people started living together on large properties and very few leaders owned large collections of the region's property¹⁶.

This led to the laws of primogeniture, and entails. The law of primogeniture allows the property to only be inherited by the family's eldest son. Entails made it so the property could not be split up to anyone outside of the family. The combination of these two laws resulted in the property never being split up.

Both of these rules were made with the goal of keeping the property large and, therefore, safe. "The security of a landed estate, therefore, the protection which its owner could afford to those who dwelt on it, depended upon its greatness. To divide it was to ruin it, and to expose every part of it to be oppressed and swallowed up by the incursions of its neighbours. The law of primogeniture, therefore, came to take place¹⁶."

These rules were reasonable at the time of their creation because of the circumstances at the time, however, Smith warns that "Laws frequently continue in force long after the circumstances which first gave occasion to them, and which could alone render them reasonable, are no more¹⁶." At the time Smith is writing the *Wealth of Nations*, these massive properties are no longer reasonable, but rather a waste of valuable resources.

The law of primogeniture only allows the eldest son to inherit the property, so he is enriched while any siblings he has are left to beg. What is worse for Smith is the policy of entails, because that leaves the owner with a massive property that he cannot possibly utilize to its fullest economic potential. Rather than allow the landowner to benefit by selling the land to someone who can use it more efficiently, entails require that the land stay with its owner and sit unused.

¹⁶ Smith Chapter II, Of The Discouragement of Agriculture in The Ancient State of Europe, After The Fall

This problem arose because, as a solution for a current problem, restrictions were placed on these properties. “The possibility of their being divided again was as much as possible precluded for ever¹⁶”. Smith is concerned that placing a permanent solution on an asset, particularly on a piece of land, will lead to its underutilization for years to come.

Smith’s concerns are very possible for CEs. These restrictions make sense now, but we have no way of knowing if they will make sense forever. Hobbes’ Leviathan works as a system because it is not tied down with no way to adapt to a changing future; it is an artificial person who can use its will to make new decisions as conditions change. CEs as dead contracts cannot.

Hobbes would address these concerns through the sovereign; the sovereign can look at the facts of the situation and remove a set of permanent restrictions when necessary. Smith is more concerned with preventing inefficiencies than fixing the future into place and takes peace for granted. The market needs room to allocate resources efficiently and any permanent restrictions place administrative huddles in the way that do not need to be there. Smith is not as loyal to ensuring permanence the way Hobbes is, but rather he wants to prevent artificial rules from creating inefficiencies. Smith places his faith in an invisible hand while Hobbes stresses the necessity of a visible one.

The Relationship Between the Will and the Future

I believe that anything which hopes to fix the future into place needs to have a will of some kind. Though the future does not exist yet, it is more likely to change than it is to stay the same. If that were not the case, then Hobbes’ entire project would be unnecessary. Fixing the future into place is important because there are a number of potential futures that leave us worse off than the state we are in presently, however, Hobbes’ system has room to adapt to changing conditions.

Of The Roman Empire.

The leviathan has a will guiding what actions it takes, a natural person at its helm who can exercise discretion when conditions change. The leviathan is alive in a way that CEs are not. CEs are a dead contract with almost non-existent room for change. Both the leviathan and a CE are bets into the future; however, the leviathan is a much more reliable bet than a dead contract. If we were to place bets on if I were to win a game of football, I would be more willing to bet on myself if I had the ability to move my feet. If my shoes are glued to the floor, then eventually the opposing team will defeat me.

Though I have no policy solution for the issues concerning perpetuity, clearly CEs will get left behind if they have no room to adapt. Though we want stability we cannot glue something's condition into place and leave it defenseless. Of course, this still ignores that the initial decision as to who will be on the court is the most important. Once we have a player on the payroll, we have already paid to place them on the team. If they are not a strong contender and we never put them in the match, then we wasted resources recruiting them only to never utilize them. The questions around the future focus on what to do with resources once we have them, so we also need to decide what CEs we will and will not pay for.

Part II: CEs and The IRS as an Artificial Person

The analysis in this section looks for inspiration to improve the policy by considering the artificial personhood of the IRS. An artificial person is an entity with the ability to make decisions for natural persons, however, the artificial person will have a natural person at the helm making decisions. This is important because if the artificial person is going to be capable of making decisions for a natural person, it needs to have comparable tools to a natural person— if not superior ones. This section looks at what

tools a natural person uses when making decisions so we can artificially recreate these tools as policy in the next part.

The Goal of CEs

When fixing some condition into the future there has to be a purpose. With society as a whole that purpose is obvious for Hobbes; his goal is to fix society into place to avoid the war of all against all. For CEs, the goal can be different depending on who is asked. Obviously, the goal is to preserve something, but there is some debate as to what that something is. A few possibilities of what CEs aim to preserve include the ecological benefits of the land, the overall aesthetic of the land, or preserving some historic landmark; or, sometimes, a CE can simply aim to fix the condition of the land into place for the sake of the current owners.

For the sake of this discussion, I am going to assume that CEs are attempting to preserve the ecological benefits of the land since it makes discussing the policy more straightforward. However, it is important to note that whatever the goal of a CE is affects the policy around the CE system. If the goal is to preserve the aesthetic of the land, then changes can be made to the property, even if they are ecologically harmful, so long as the property retains its overall visual composition. If the goal is to preserve a historic landmark or building, then it is likely necessary to do some physical maintenance on the property in order to keep the property in the most pristine condition possible.

The most concerning one of these goals is if the goal is to fix the condition of the land into place for the sake of the current owners and allow for no changes to prove this point. Sacrifices must be made in order to allow for this goal to be fulfilled. Particularly, if the property can be used for something of a higher value than its preserved state allows

for this goal would close off that possibility. The one thing that is certain about the future is that the state of things will change, so this bet is a particularly dangerous one. It does not allow for any adaptation in policy to increase society's odds of getting a better payoff from this property.

As I said earlier, I will make all policy suggestions based on the assumption that the goal of CEs is to preserve ecological benefits. My policy suggestions will fall short if that is not the goal that the US federal government chooses. It may be necessary for there to be different kinds of CEs with different policies surrounding them. My policy suggestions will only work if a property's value can be quantified in some way. However, it is difficult to quantify the benefit of scenic views, historic landmarks, or the protection of endangered species. This is all important to keep in mind as it creates a limited set of circumstances where my policy suggestions will be effective.

Implementing a Will in the Conservation Easement Approval Process

Currently, this process works as if the IRS is signing a blank check to property owners if its guidelines have been followed. Land trusts find properties and make sure that these properties follow the IRS' guidelines, then the IRS goes through the courts retroactively if there is some issue concerning fraud. Congress passed legislation allowing for CEs and they insisted on perpetuity and a variety of these other key aspects. The IRS then developed their guidelines and practices based off of Congress' legislation.

What I am proposing is that the congress gives the IRS the ability to reject CEs that cause society to overpay for the ecological value of that property, even if the CE is otherwise valid under the IRS' guidelines. Congress can pass new legislation to give the

IRS the ability to reject CEs when the income tax deduction exceeds the benefits of preserving the property, even if those CEs are valid according to the current guidelines.

To put this more simply, when you are shopping at a store it is very unlikely that you will deal with issues concerning fraud. For example, typically every item for sale comes from legitimate sources and has no legal issues whatsoever. Even then, as a consumer you still need to look at the prices of what you intend to buy. If a box of cookies is \$20, it is perfectly reasonable for a consumer to not buy them because they view that as a higher price than the item is worth. A rational consumer will compare the value to what they are receiving to the price that is being charged and decide accordingly.

Currently, the IRS is buying the development rights of properties by offering income tax breaks. This means that the IRS is reducing the government's cash flow by accepting these CEs and they are allowing for the possibility of overpayment by not comparing the value of the CEs to the price. And, more importantly, they are not overpaying on their behalf alone but rather on behalf of the American people.

Now, most consumers run the numbers internally. We have some intrinsic sense of what value \$20 has to us and what value we get out of eating cookies. However, as an artificial entity, the IRS does not have the capability to run these numbers subconsciously. So, it is necessary for us to create a model which can copy a person's ability to intrinsically run these calculations.

Cost vs Benefit: The Difference Between Market Value vs Ecological Value in CEs

When a consumer wants to buy a good, they measure the value they get from the good against the price. Economists call the value from the good utiles, which serves as a measure of the utility the consumer gets from the good. So, if a consumer was deciding

between buying two goods (goods A and B), the result of their decision-making process will look like this:

$$\frac{\Delta u_a}{P_a} > \frac{\Delta u_b}{P_b}$$

The ratio of the benefit of buying the next unit of good A over the price is greater than the same ratio for good B. Assuming this consumer is rational, meaning that they aim to maximize their own utility, the consumer will buy good A rather than good B. Going back to the cookie analogy, an economics professor teaching an introductory course would assign some arbitrary units to the value the consumer got from cookie A and cookie B to prove this point. Cookie A costs \$2 and provides 30 utilities; cookie B costs \$6 and provides 60 utilities; 15 is greater than 10, therefore the consumer will buy cookie A.

The goal of this project is to outline a way the IRS can turn this concept into a policy that can be applied to future CEs. The first problem that needs to be overcome is that the numbers in the previous example were, as mentioned before, arbitrary. A real person is able to run this calculation internally based on their preferences. The IRS is not a real person, but an artificial entity. In order to recreate a natural process inside of an artificial entity, we need to establish some values that are not arbitrary.

To base a policy around this calculation we need to answer two questions: first, what can we consider as a maximization of the IRS's "utility" in a CE transaction; and second, what is the cost? The cost is the easier of the two to questions to answer, it is simply the value of the income tax deduction. This is not necessarily a dollar amount paid, but a reduction in cash flows and an opportunity cost of what could have been done with those tax dollars.

The first question is a little misleading, as this policy does not consider the IRS' utility, but rather society's utility as interpreted by the IRS. The purpose of the government accepting any kind of donation is to benefit society as a whole. A definition for society's utility would have to come in the form of guidance from Congress. However, we know that society's utility would be based off of the ecological values that are protected by the easement.

Part III: Policy Suggestions

How Hobbes Inspires Policy

To summarize Hobbes, there is an artificial person who makes decisions for a natural person using its will. This artificial person is the government who we give the authority to dictate society's rules so that we can avoid conflict. The government's will is the sovereign. In the United States it is not perfectly clear exactly who the sovereign is since our government's power is divided. There are artificial entities with the ability to make decisions on how other artificial entities act. In the case of CEs, what the IRS has the authority to do as an artificial person is dictated by Congress.

When analyzing problems in policy, sometimes we cling to how things currently function. We forget that policy is artificial, and it can be radically changed at any time by the sovereign. We also forget that artificial decision making is possible because artificial entities have the authority to decide for natural persons, so a natural person's decision-making process serves as great inspiration for what our policy should look like. As an advisor to the sovereign, I can offer more efficient policy options based on a natural person's decision-making processes.

In the next few pages, I will offer up two policy options with the goal of only giving tax deductions to CEs that pay for themselves. One policy is theoretically optimal, but costly to implement and the other cheaper to implement, but not 100% successful. Both stem from a cost analysis method for determining if these CEs break-even.

A Policy which can Account for The Cost vs Benefit of CEs

I propose that the IRS should require a CE to break even before property owners are given an income tax deduction, even if that CE is otherwise valid. This would reduce complaints of the CE system being abused for its tax benefits.

In order to determine if a CE breaks even, the IRS would need a standardized model to compare these two notions of value. This project estimates a dollar amount for each of these values by using different documents associated with the CE and then creates a ratio of the societal benefits over the cost to society. This ratio offers a simple way of seeing if the CE pays for itself in its lifetime, or if it “breaks even.”

$\frac{\text{Ecological Value}}{\text{Lost Income Tax Dollars}} \geq 1$	The CE’s benefits are greater than or equal to its costs	CE “breaks even”
$\frac{\text{Ecological Value}}{\text{Lost Income Tax Dollars}} < 1$	The CE’s benefits are less than its costs	CE does not “break even”

Only giving an income tax break to CEs that at least break even would solve the issue with syndicated CEs in particular, since the worst abuses of CEs are often syndications. The difficulty here is quantifying those ecological benefits. Currently, all we have to analyze the ecological benefits of CEs are qualitative descriptions of property. We need a quantitative estimate on the value of some of the ecological values of these properties in order to make a fair policy. This will be further explained in the methodology section.

Costs of The Break-Even Policy

Implementing Break-Even Policy is the most effective solution for overpaying for CEs. It prevents overly generous income tax deductions being awarded for CEs placed on properties without the ecological values to warrant it. However, this policy does require an extensive amount of labor to implement. First, there would need to be an updated study on the monetary value of these ecological benefits. Then, every property would need to be surveyed in order to determine the amount and types of ecological value. This work would need to be done for all potential CEs, including for the properties which the IRS may eventually deny an income tax deduction for.

Now, one way to mitigate some of the overhead costs is to place the surveying on the shoulders of those applying for the income tax deduction. After all, these individuals are already responsible for paying for the appraiser. However, this will decrease demand for the program. Anyone wishing to donate the development rights of their property would have to put in a higher fixed cost than previously with a lower expected value. The IRS can consider returning these fixed costs for CEs they approve of in the form of additional income tax deduction. This potentially would result in the IRS overpaying for some CEs; however, this may reduce the loss in demand for the program.

Another solution would be for the IRS to still offer an income tax deduction to the CEs with a negative present value, however, they would only offer a maximum income tax deduction of the value of ecological benefits. The hope here is that, while property owners could theoretically get a higher payoff from development, they may not be willing to put in the effort to develop the property and may settle for a lower immediate payoff. However, if this is the strategy that the IRS would want to use, then we have to

ask why we would continue to consider the appraisal at all. This may also decrease demand for the program in more expensive locations.

While the costs of gathering the ecological data can be moved to another source, there are potential costs associated with this policy suggestion that make it almost impossible. While the break-even rule is theoretically straightforward, gathering the data to implement it will never be. This will lead to a lawsuit almost every time a CE is deemed ineligible for an income tax deduction. Though the break-even policy would offer the optimal results, the costs are unrealistically high. The rule is too flexible and offers the potential for litigation.

Policy “Shortcuts”

Ultimately the break-even policy is too expensive to implement, so we can look to the data for shortcut policies. Congress can mandate that the IRS runs this cost benefit analysis once every decade to identify major trends around the CEs that at least break-even. The overall policy around CEs can stay the same, with the only difference being common features in the CEs with a positive present value become mandatory.

The goal with these policy shortcuts is to utilize the cost analysis method without introducing its costs on a larger scale. Although these shortcut policies will not guarantee that every individual CE will break-even, they increase society’s return on investment in CEs on a macro-level.

The Data Set and The Methodology

Methodology

The Trust for Public Land Report

In order to determine if a CE breaks even, I need the loss of income tax dollars and a practical estimation of the ecological values protected by the CE. I will elaborate more on the income tax dollars further in the “CE Appraisal Values” section, however, there is existing literature with methods for valuing ecological features of land.

Economist Jessica Sargent-Michaud¹⁷ worked with The Trust for Public Land to estimate the value of conserved land in Colorado, with the goal of determining how many dollars in ecological value did the state of Colorado get per lost income tax dollar. She used a valuation of per acre values of forest, agricultural area, wetlands, and bodies of water to estimate how much the state of Colorado was benefiting from preserving CEs.

She does this by pulling data from previous studies which value ecological features by acre and calculating the value that the state receives. Sargent-Michaud uses numbers provided by The Nature Conservancy, who estimated the amount of protected land present and separated them into specific ecosystem types. After comparing the value generated per year by the conservation of the property and the lost tax dollars given to ‘purchase’ the conservation, Sargent-Michaud came to the conclusion that the Conservation Easement program, in Colorado, has had a return of 6:1 for every 2008 USD invested.

¹⁷ Jessica Sargent-Michaud, A Return on Investment: The Economic Value of Colorado’s Conservation Easements

However, when looking closely at the specifics, a few issues arise. They got the value of each acre of environment from several different sources, most published multiple years apart and upwards of 8 years previous this study. During this time the value of these ecosystems could have changed drastically resulting in an inaccurate estimation of return to investment. Another issue is that the CE program is a federally run program, so looking at CEs on the state level underestimates the cost paid to obtain the CE. For example, it is possible for a CE to be present in Colorado, but for the person donating the CE to claim benefits in another state. Colorado does benefit from the CE and does not have to award any state level incentives to obtain it.

Sargent-Michaud also does not include any information on the upkeep costs of this program. The labor and infrastructure needed, although most likely dwarfed by the value of the easements, should not be excluded from the cost of the program. With that being said this is a great introductory study on conservation easements that offers a specific value for return on investment and gives a good estimate for how profitable this program is on a national level.

Sargent-Michaud's project focused on if CEs break even on the state level, meaning did the state of Colorado award less income tax breaks than it received in value of preserved land. Her method for determining a monetary estimate of ecological values is valuable for this project, however, her goal is slightly different than mine. Unlike Sargent-Michaud, I have access to individual appraisal values and individual descriptions of CEs.

This paper will focus on the individual costs and payoffs of CEs. The costs in this case being the loss of federal income tax dollars and not state benefits, such as in the case

of Sargent-Michaud's paper. CEs are a federally run program and as such they either need to be looked at from the macro-level or on an individual level. If you look at the cost and benefits for CEs on a state level, you risk drastically underestimating the costs of the CE because you ignore where most of the payment comes from.

Unlike Sargent-Michaud, I have the ability to compare the costs and benefits of CE's on an individual level because I have appraisal values for each of the CEs in my sample. However, her method has a tremendous amount of value as it allows me to estimate the ecological values per year by using her method. I hope to improve on estimating the cost of CEs to determine if the United States as a whole benefits and not any one specific state.

The Variables

In order to determine the ecological value of the property, I needed to determine the makeup of the property. The following factors were all considered: the size of forest on the property, the type of forest on the property, the size of wetland on the property, the size of a body of water on the property, and the size of any agricultural area on the property. Using the numbers from Sargent-Michaud's paper¹⁸, I then estimated the value of the property in perpetuity and compared that to the amount of income tax dollars lost.

The Documents Analyzed

This dataset was created from 61 syndicated CEs that we randomly selected from The Atlantic Coast Conservancy. In order to get these variables, I analyzed the CE's Borderline Documentation Report (BDR), its appraisal, and its final CE contract. Significantly, this dataset contains appraisal information. While the CEs themselves are a

¹⁸ Sargent-Michaud's numbers are in the appendix, recalculated in 2020 USD.

matter of public record, research has been stalled in this area because there has been a lack of financial information to analyze. Each of these three documents gave specific information about each CE, which will be laid out in summary statistics tables as they are discussed.

Borderline Documentation Report and Conservation Values

Every CE in this dataset has a BDR which outlines the ecological values at the point that the property falls under CE protection. The BDR is where all of the conservation benefits are listed, as a sort of one stop shop for reasons the CE is a valid easement. It serves as a centralized location to get basic information about each CE.

Outlined in the BDR, among other characteristics of the property, are the following: its size; location; ecological values; historic significance; any presence of threatened/endangered species on the property; and whether it follows a state conservation plan. The BDR only has qualitative descriptions of these features, in the methodology section I will elaborate on how I estimated a numeric valuation.

The Restrictions of the CE

Outlined in both the BDR and the CE's contract are restrictions placed on the property; agricultural areas; resource protection areas; homesites; and other acceptable development areas. The contract also states any rights that the property owner retains, such as the ability to maintain the property or put up a footpath.

Commonly, carbon credits and alternative energy are discussed in the CE's contract. Concerning carbon credits, the typically CEs states that "Grantor shall retain all rights, benefits, privileges and credits related to carbon sequestration in the above ground carbon sequestration" and the CE requires that any carbon sequestration occurs in the

agricultural area. Carbon Sequestration is the name for the effect of plants and other wildlife to take carbon dioxide out of the air and incorporate it back into the soil. A study done on the forests of Sweden showed that carbon sequestration corresponded to 0.5% of the regions GDP and was 40% of the value of the forest as a whole.

Concerning alternative energy, the CE typically states that alternative energy sources can be placed on the property's agricultural area with prior written notice. The power generated is expected to be primarily used for the property.

The CE's contract mainly offers details on the restrictions offered in the property, so this document did not offer many variables to the project. However, carbon credits and alternative energy indicate other ecological values that the CE can generate.

CE Appraisal Values

Finally, there is the appraisal which states the CE's previous best use before restrictions, its before value, after value, and the value of any enhancement. The value of the property before the CE is placed is called the before value and it is based off of the property's previous best use. What an appraiser would have to show is that a property can realistically be developed in a certain way to increase its value and that increase in value would be the value of the development rights. Then there is the after value, which is the value of the property without those development rights.

The value of the CE is the before value minus the after value, also subtracting any enhancement value the property has. The enhancement value is the value gained by any contiguous properties that are owned by the owner of the property or the owner's family. When a CE is placed, surrounding properties benefit. As a result, any enhancement lessens the value of the CE as a donation.

Here is an example of what an appraisal would look like, with fake numbers in order to protect the confidentiality of any individual CE’s appraisal. The before value less the after value is the value of the CE. Subtract any additional enhancement that would be received from a family member owning a property adjacent to the CE, and that is the amount of income that can be deducted.

Figure 1 Example of Language Used in an Appraisal

Estimated Value of the Market Value of the Non-Cash Charitable Contribution	
Estimated Value “Before” Conservation Easement	\$1,000,000
Estimated Value “After” Conservation Easement	(\$100,000)
Estimated Value Non-Cash Charitable Contribution Before Enhancement	\$900,000
Less Estimated Value of Market Enhancement	(\$50,000)
Estimated Market Value of Non-Cash Charitable Contribution	\$850,000

Different Types of Property Restrictions from the CE

When preserving a property there need to be different types of restrictions based on the different features and uses on the property. CEs address this by creating different areas with different restrictions. For this specific sample of CEs there are 4 main types of areas: resource protection areas, agricultural areas, acceptable development areas, and open areas.

Each area has specific restrictions that vary by property, but generally the areas which offer the most protection are resource protection areas and open areas. Resource

protection areas typically protect some ecological feature of the land, such as a body of water, a wetland, a forest, or a specific minable resource. Open areas are typically defined last, as they comprise of the remainder of the property after all the other area types are defined. Open areas give limited development rights to the property owner, with examples including carbon sequestration, the ability to remove dead tree limbs, the ability to construct fences, and the ability to maintain a foot path.

Acceptable development areas and agricultural areas allow for the property owner to change or remove certain ecological features. The agricultural area allows for forest management, pesticides, livestock, and farming operations. In this dataset, examples of agricultural use vary from a pecan orchard to sod farming. An important note is that agricultural areas allow for property owners to remove natural features from the property such as forests, so agricultural areas offer limited ecological protections.

In the acceptable development areas property owners are allowed to develop the property, with common examples including roads, homesites, and powerlines. These areas allow people to still live on the property, however, they offer almost no ecological protection. The property owner retains the right to “create, maintain, improve, repair, remove, enlarge, or replace¹⁹” the structures allowed in these areas. This may sound generous, but permission needs to be granted for construction and maintenance in every situation, so these rights are limited by the land trust.

Estimation of Areas

The restriction area types on a CE are significant because those areas determine if any ecological features are being protected. The BDR describes what conservation values

¹⁹ Text taken from a specific CE in this sample. Often the language used when writing a CE is repeated in multiple CEs.

are present on the property, however, there are limited quantitative data as to how much of the property that feature takes up. What the BDR does have are maps showing the location of each type of area on the property.

For example, a BDR may list that a property has hardwood forests but will not provide the number of acres that this forest covers. Taking the maps in the BDR, I overlaid a grid pattern over each of these maps and used that to estimate the percentage of the property taken up by each ecological feature. I then took this percentage, multiplied it by the size of the property in acres, and that resulted in an estimation of the ecological features the property contained, in acres.

Assumptions

In calculating the ecological value of the property there were some assumptions that needed to be made with the data to ensure only the ecological values in protected areas are counted. If the property owner has the right to modify or remove an element from the property, then that element was not counted as if it has been conserved. Likewise, if a pre-existing property restriction was expanded, then only the annexed area of the restriction was counted and not the original restriction.

Forests

The most impactful assumption made is that the value of forests was only considered if the forest was located in an area that specifically prohibited the removal of trees. The goal of this project is to measure the value of the protected ecological features, so I must only consider the restrictions placed on the property in my calculations. Though a forest or other valuable ecological feature may be present on the property at the time the CE was placed, if that feature is placed in an agricultural area or in an acceptable

development area, then it is not protected. Because of this, there is a distinction in my calculations between what features are present at the inception of the CE and what features are actually protected.

Though 57 CEs claimed to have forests on the property, only 33 placed those forests under a resource protection area or under an open area. The other 24 CEs placed agricultural areas over the forests. Since the agricultural area is not protecting those forests, that land is valued as farmland and a fixed value in my calculations. Similarly, I place no value on acceptable development areas because they provide no conservation value, regardless of what features may be present at the time the CE is placed.

Rivers and Riparian Buffers

The second assumption I have made is on how to count rivers and riparian buffers. Many of the CEs placed on properties with rivers expanded upon preexisting riparian buffer protection requirements. Concerning the states in this data sample, Georgia requires a 25 ft buffer from the center of the river toward each bank; Alabama, Florida, and Tennessee require a 35 ft buffer; and West Virginia requires a 50 ft buffer²⁰. Since these requirements would have existed regardless of if a CE was placed on the property, only the previously unprotected areas around the river were counted when valuing the ecological conservation values.

Conservation Values with No Clear Monetary Valuation

Additionally, when determining the ecological value there were a number of factors ignored when making these estimations. These were simply characteristics to

²⁰ State requirements were mentioned in the BDR of each CE, so these numbers come from The Atlantic Coast Conservancy.

which I could not assign a dollar amount²¹. Location, the presence of threatened or endangered species, the presence of historically significant landmarks, songbird migration routes, and scenic views were all ignored; however, these are all things that BDRs tout as conservation values. Table 1 shows how many CEs claimed to conserve a threatened or endangered species, a historically significant landmark, a mineable mineral²², and if the CE falls on a songbird migratory route.

Type of Value Claimed	Number of CEs
Threatened Species	5
Federally Endangered Species	1
Historic Value	4
Mineable Minerals	13
Songbird Migratory Route	23

Table *Conservation Values with No Clear Monetary Valuation* shows the number of CEs with conservation values which are difficult to assign a monetary value.

Ponds and Littoral Buffers

Similar to the assumption made concerning rivers, ponds also have some preexisting protections separate from the CE. However, because ponds are an uneven shape, I counted the whole pond when calculating the conserved ecological values. This affects 23 of the properties in this sample and is something that can be considered an overestimation of conservation values.

For 21 of the 23 properties with a pond, the simplification method used above resulted in an average maximum possible price overestimation of 3.83%, with 2 of the CEs being outliers having a 16.20% and 19.91% maximum possible price overestimation. This means that on average, the maximum overestimation of the CE's conservation value

21 This is not a unique problem to this project, as some things that provide great ecological value are not included in the IRS criteria; for example, there is not anything explicit that gives benefits for CEs that protect drinking water. CEs that protect drinking water have to justify themselves through 1 of the other IRS criteria, such as providing scenic views or following a preexisting conservation plan.

22 The presence of a mineable resource is difficult to value because its value does not come from its presence on the property but from preventing the negative externalities associated with extracting it.

was 3.83%, or the maximum value that the pond contributed to the CE's conservation value.

Overlap

Another problem that occurred is the presence of overlap between bodies of water and wetlands on the property. This affected 31 of the properties in the sample and on those properties, the overlap was counted and then divided evenly between the features in question.

Income Tax Deduction

The final assumption I made was to standardize the loss in cash flow to the US Government. When calculating the maximum loss in tax dollars, I assumed a tax deduction value of 25%; meaning, the entirety of the appraisal value was deducted from income taxed, but only 25% would have been paid as tax dollars. Each dollar amount in this project was calculated in 2020 dollars. I am also ignoring the possibility of there being additional benefits coming from any state program.

Additionally, I assumed that all of the possible deductible value was claimed in the first year. This assumption is reasonable because every CE in this sample is a syndication, so there are multiple individuals who can claim the income tax deduction in the first year. This assumption lets me ignore the difference in value of the tax deduction in future years.

Example of the Break-Even Analysis

So far, the methodology has only been discussed in abstract terms, so it is necessary to give an example to clarify what this project aims to achieve.

Here is an example of this method on one imaginary property with made up appraisal numbers. The appraised value of the CE is the amount that can be deducted from tax income; however, it is not the amount of tax dollars lost. The reduction of the cash flow of income tax dollars is the amount deducted from income multiplied by the tax bracket that the taxpayer falls into. If we assume a CE value of \$850,000.00 then the loss of income tax dollars would be 25% of that, or \$212,500.00.

For the ecological values, let us assume the property in this example is 100 acres and the property has the following features: 50 acres of mixed forest, 30 acres of farmland, 15 acres of wetland, 4 acres of flowing water, and a 1-acre homesite. The homesite is in an acceptable development area and thus has no conservation value. The 30 acres of farmland is in an agricultural area and thus only has conservation value as farmland regardless of what features are on that part of the property. Agricultural area is valued at \$340.01 per acre, so the total value is \$10,200.30.

For the sake of this example, all of the other ecological features mentioned are in a resource protection area. The 50 acres of mixed forest are valued at \$1,057.24 each, or \$52,862.00 total; and the 15 acres of wetland are valued at \$941.94 each, or \$14,129.10. These values are simple to calculate; however, the value of the flowing water requires an extra step.

Let us assume that this property is in Georgia, where there is already a required minimum riparian buffer of 25 ft from either side of the center of the river. We will also assume that this CE, like the majority in the sample, increased the riparian buffer to 100 ft from the center of the river. This means that only $\frac{3}{4}$ of the protection offered to the

river are new protections and that ¼ of the protection is not a part of the CE’s value. So, calculating the area of river newly protected by the CE looks like this:

$\frac{200 \text{ ft} - 50 \text{ ft}}{200 \text{ ft}} * 5 \text{ acres} = 3.75 \text{ acres}$
--

The 3.75 acres of the new riparian buffer is valued at \$320.79 acres each, for a total of \$1202.96. We can total all of the ecological value that the property contains for a total present value of \$78,394.36 per year, as shown in Table 2. And finally, we can then take that per year value and divide it by the real interest rate, 3%, to get the property’s perpetuity value, or \$2,613,145.33.

Table 2 Sample Property Break-Even Calculations	
Feature of Property	Value Per Year
50 acres of Mixed Forest	\$ 52,862.00
30 acres of Farmland	\$ 10,200.30
15 acres of Wetland	\$ 14,129.10
5 acres of Flowing Water	\$ 1,202.96
1 acre Homesite	\$ 0.00
Total	\$ 78,394.36

Now that we have the income tax dollars lost and the perpetuity value of the property, the final step is to compare if the investment made on the CE broke even. The per acre ecological value is \$26,131.45 and the per acre loss in income tax dollars is \$2,125.00. It is obvious that this CE does pay for itself. Mathematically, \$1.00 of lost income tax dollars buys \$12.30 of protected ecological value.

$\frac{\$26,131.45}{\$2,125.00} = 12.30$	The CE’s benefits are greater than its costs	CE “breaks even”
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This property is a great investment for society and we want to increase the amount approved of CEs like this one, so we get a better overall break-even rate. We would need to repeat this process for other CEs and see what features the CEs with a positive present value share. For example, say we repeated this process on 50 other CEs and, typically,

the CEs that at least broke-even had more preserved forest than the CEs that did not break-even; then, we may consider implementing a policy that requires a certain percentage of the property to be preserved forest. The value of this project is in proposing this model and I am running the model in this paper to show what the potential results can be.

Results

Now that we have walked through the method, the variables collected, the assumptions made, and a tangible example we can move on to analyzing the results on the 61 CEs in this sample.

Summary Statistics

State and Year

State	Number of CEs	Different Counties with CE	Number of CEs that Support a State Plan
Georgia	41	28	41
Alabama	10	7	9
Florida	6	2	6
Tennessee	3	4	3
West Virginia	1	1	1
Total	61	42*	60

Table *Locations of CEs* by State shows the locations of CEs by state, how many different counties per state, and the number of CEs per state that support a state plan. There are 3 CEs that are located simultaneously in 2 counties, one CE in Tennessee and two in Georgia.

Year	Total Number of CEs
2010	2
2011	4
2012	7
2013	14
2014	8
2015	7
2016	17
2017	1
Total	61

Table *CEs by Year* shows the different years the CEs were from, with the majority of CEs from the sample being from 2013 and 2016.

To give some context, the CEs in this sample are located in five states, as shown in Table 3, and were finalized in 2010 – 2017, as shown in Table 4. They also are not concentrated in any specific part of the state; to use Georgia as an example, its 41 CEs are spread out across 28 different counties. Also, all of Georgia’s CEs support a state conservation plan.

Whether or not a CE follows preexisting government conservation plans is an important factor in determining the societal value of that CE. In order for a CE to be eligible for an income tax deduction the IRS requires that the property have some kind of scenic view or that the CE aligns with a “clearly defined federal, state, or local

governmental conservation policy.” The majority of these CEs support a state conservation plan, with the most common being Georgia’s Comprehensive Wildlife Strategy, with all 41 CEs in Georgia supporting it.

Georgia’s Comprehensive Wildlife Strategy says its goal is “to conserve Georgia’s animals, plants, and natural habitats” and that it aims to achieve that partially through public agencies and private conservation organizations²³. Specifically, the plan includes a goal of increasing funds available to CEs as one of its highest priority conservation actions²⁴.

According to the plan, CEs are protecting more land than state owned land. Between the 2005 and the 2015 versions of the Georgia Comprehensive Wildlife Strategy, Georgia had acquired “more than 105,000 acres of high-priority lands for wildlife conservation and public recreation” with “conservation partners and easements protect[ing] another 290,000-plus acres²³,”

CEs play a key role in achieving Georgia’s conservation goals. A particular example of the state contributions of CEs are the caves of Southwest Georgia. The caves in the Pelham Escarpment area of Southwest Georgia provide habitat for rare species such as “the southeastern bat, Georgia blind salamander, and Dougherty Plain cave

23 Georgia Department of Natural Resources, pg. x

24 Georgia Department of Natural Resources, pg. 224

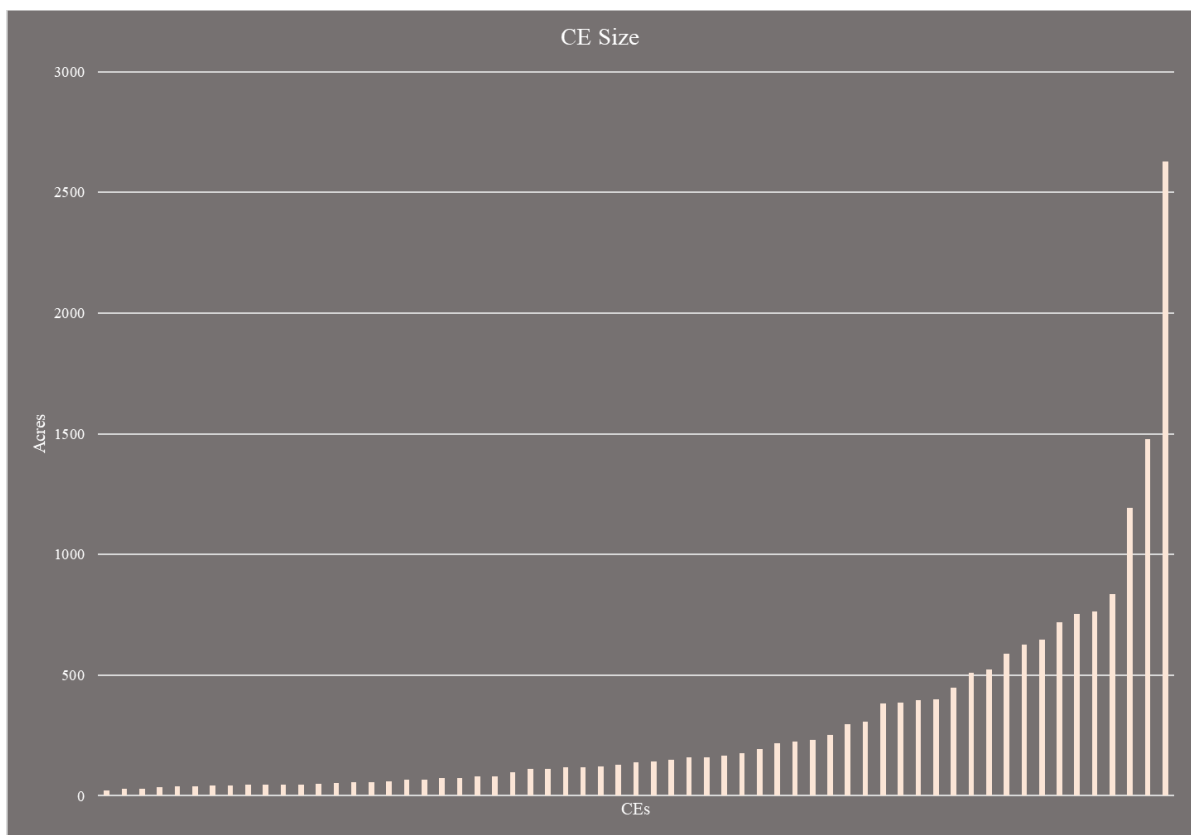
crayfish²⁵.” CEs were protecting these caves while no caves from this region were under the protection of state-owned land.

CE Size

Table 5 CE Sizes		Table 6 CE Size Statistics	
Size Range (acres)	Number of CEs	Mean	296.23 acres
0-100	24	Median	138.23 acres
101-200	14	Minimum	21.89 acres
201-400	10	Maximum	2629.70 acres
401-600	4	σ	424.28 acres
601-800	5		
801+	4		
Total	61		

Table *CE Sizes* sorts the CEs by property size, in acres. Table *CE Size Statistics* gives the mean, median, minimum, and maximum CE size in the sample. Graph *CE Sizes* is a visual representation of the individual data points analyzed in these two tables.

Figure 2 CE Size Graph



This Graph shows the size of all the properties in this sample, sorted from smallest to largest. The average property size is 296.23 acres.

25 Georgia Department of Natural Resources, pg. 129

In this sample, the average size of a property is 296.23 acres with a standard deviation of 424.28 acres, as shown in Table 6. The smallest property in the sample is 21.89 acres and the largest is 2629.70 acres. 39.34% of the sample is under 100 acres, 22.95% of the sample is between 101-200 acres, and 37.70% of the sample is above 201 acres.

Scenic Views

Table 7 Scenic Views	
Type of View Claimed	Number of CEs
Any Type of Scenic View	34
Highway	15
Local Street	21
River	7
City	3
None	27
Total	61

Table *Scenic Views* shows the total scenic views claimed on the Baseline Documentation Report of a CE. 34 CEs claimed any type of scenic view, however, there are 12 CEs which claim more than 1 type of scenic view. This results in the highway, local street, river, and city scenic views not totaling the 34 CEs which claimed scenic views but totaling 12 more than that number (46).

The IRS guidelines also consider if a CE has scenic views that are available to the public. Over half of the CEs in this sample claimed some kind of scenic view on the property and 12 of the properties claimed multiple scenic views. The BDR lists the type of scenic views; the specific street is listed, if there are scenic views from a navigable river on the property, or, more generally, if a city can enjoy the property.

Table 8 shows the scenic views claimed, sorted by linear distance claimed. For the properties which included a linear distance of the scenic views claimed, there was an average of almost 6,000 ft for every scenic view to a highway claimed, almost 4,700 ft for scenic views to a river, and just over 4,000 ft claimed for every local street.

Scenic views are listed explicitly as a conservation purpose that legitimizes a CE to the IRS, however, there is no minimum standard for what constitutes a legitimate

scenic view. Most CEs in this sample gave a linear distance, however, 3 scenic views were claimed with no mention of length. And while it is logical for a single property to offer scenic views to a highway, local street, or a navigable waterway I am not convinced that a single property can offer scenic views to an entire city. Of the 3 CEs in this sample that claimed city scenic views, 2 gave linear distances but 1 claimed scenic views to a city with absolutely no justification.

In order for scenic views to be conserved by tax dollars, there needs to be some standard as to what is being protected. Unfortunately, I was unable to find any persuasive literature valuing scenic views, so the method used in this project will not help. However, other standards are possible to implement, and income tax deductions should not be awarded without a metric to determine the benefit of the scenic views claimed.

Table 8 Scenic Views by Distance				
Distance	Highway	Local Street	River	City
Under 1,000 ft	0	0	1	0
1,000 ft to 2,500 ft	4	10	1	1
2,501 ft to 5,000 ft	2	7	3	1
5,001 ft to 7,500 ft	4	2	1	0
7,501 ft to 10,000 ft	1	1	0	0
10,000 ft +	3	2	1	0
Linear distance not given	1	1	0	1
Mean	5975.43 ft	4072.12 ft	4699.51 ft	2347.50 ft
Total	15	23*	7	3

Table *Scenic Views by Distance* sorts the number of scenic views by linear distance. 2 CEs claim 2 separate local street scenic views, so totals on this chart will not match up to the *previous Scenic Views Table*.

Forests and Water

The BDR lists the type of forest and bodies of water on the property when stating the conservation benefits. Many properties with bodies of water have a mixture of water types and only 3 properties in this sample lack bodies of water.

The majority of CEs with a body of water increase protections of riparian or littoral buffers around them. Riparian buffers protect the stretches of land around a flowing body of water and littoral buffers protect the land around a still body of water.

These buffers are important because they prevent farms and livestock from damaging rivers. These buffers not only protect the current property's quality of water, but other water sources that this river may flow to.

Table 9 Forest Type	
Forest Category	Number of CEs
Oak-Hickory-Pine	31
Planted Pine/Planted Loblolly Pine	14
Hardwood Forest	6
Mixed Mesophytic Forest	5
Swamp/Wetland Forest	4
Coastal Forest (Maritime)	3
Planted Pecan Grove	1
Total Forests Claimed	64*
No Forest Claimed	4

Table *Forest Type* shows the type of forests contained on the property. 5 of the CEs are identified as having more than one type of forest. As a result, the total forest types claimed do not equal the number of CEs (n=61).

Table 10 Water Ecological Values	
Still Water	
Still Water Type	Number of CEs
Ponds and Lakes	20
Wetlands	21
Flowing Water	
Flowing Water Type	Number of CEs
Stream	13
River	12
Creek	37
No Water	3

Table *Water Ecological Values* shows the types of still and flowing water claimed on the property. Many CEs have more than one type of water on the property, so the total water values claimed will not equal the total number of CEs in this sample (n=61).

As for the forests, 57 of the properties in this sample have some kind of forest and 5 claim more than one type of forest. Mixed oak-hickory-pine forest were the most common forest type claimed. Other common forest types in the sample include pine forests, wetland forests, and hardwood forests. Less common types include maritime

forests and mixed mesophytic forests. Maritime Forests²⁶ are coastal estuaries that grow along coastal barrier islands. The US National Ocean Service describes estuaries²⁷ as bodies of water usually found where rivers meet the sea and as some of the most productive ecosystems in the world. A mixed mesophytic forest, as defined by the World Wildlife Fund, is a critically endangered habitat in the southern half of North America²⁸. They are the remainder of the ancient mesic forests. Over 95% of this habitat has been lost over the last 200 years.

Of the 61 CEs in this sample, 64 forests are claimed. However, as mentioned in the assumptions section, just because a forest is claimed does not mean that the CE necessarily prohibits removal of trees. If the forest is in an agricultural area or in an acceptable development area, then the trees can be removed. Ecological features of the property are protected if they fall into a specific resource protection area or in the property's open area. However, 24 properties have forests which land in an agricultural area, meaning the forests can be removed for agricultural purposes.

The IRS does allow for CEs to protect farmland if it “yields a significant public benefit,” meaning that the farmland provides some kind of scenic view or that it falls inline with some local or federal conservation plan. The Georgia Comprehensive Wildlife Strategy does mention helping farmers; however, it mentions wanting to provide more technical assistance so that farmers so not damage rivers²⁹. and can restore woodlands³⁰.

While farmland is important, it is obvious that conserving farmland is not the highest priority of CEs in the state of Georgia, but rather the state aims to prevent farmers from harming the valuable ecological features of their property. I am suggesting that a

26 US National Ocean Service, What is a maritime forest?

27 US National Ocean Service, What is an estuary?

28 Loucks et al., n.d, Appalachian Mixed Mesophytic Forests

forest cannot be claimed unless the CE removes agricultural rights from a majority of the forest. And water values should also have a minimum buffer increase to be eligible to be claimed as an ecological value.

Homesites

Table 11 CEs with Homesites	
Homesites #	Number of CEs
0 Homesites	25 CEs
Existing Only	4
New Only	14
1 Homesite	18 CEs
Existing Only	0
Mixed	3
New Only	18
2 Homesites	11 CEs
Existing Only	0
Mixed	3
New Only	18
3 Homesites	5 CEs
Existing Only	0
Mixed	1
New Only	4
4+ Homesites	2 CEs
Existing Only	0
Mixed	1
New Only	1
Total	61 CEs

Table *CEs with Homesites* sorts the number of CEs by the number of homesites on each of the properties. Underneath each homesite, the CEs are sorted by if all the homesites were existing, all were new, or if there was a mix of existing and new homesites.

Unlike forests, bodies of water, and scenic views, homesites are not a conservation value. However, it is important to have a homesite on the property in order to ensure that future property owners will want to buy this parcel of land. The typical homesite in this sample is limited to 1 acre with the largest homesite in this sample taking up 5 acres, though this was an exception and not the norm. That particular property is almost 140 acres, so 3.62% of the property is dedicated to this homesite.

29 Georgia Department of Natural Resources, pg. 93
 30 Georgia Department of Natural Resources, pg. 71

40.98% of CEs allow for no new homesites and had no homesites to start with. CEs usually allow repair or replacement of existing homes and agricultural buildings. 9 CEs in this sample have at least 1 existing building on the property. Alternatively, CEs sometimes allow the “carving out” of new home sites. 42 of the CEs in this sample allow for at least 1 new homesite.

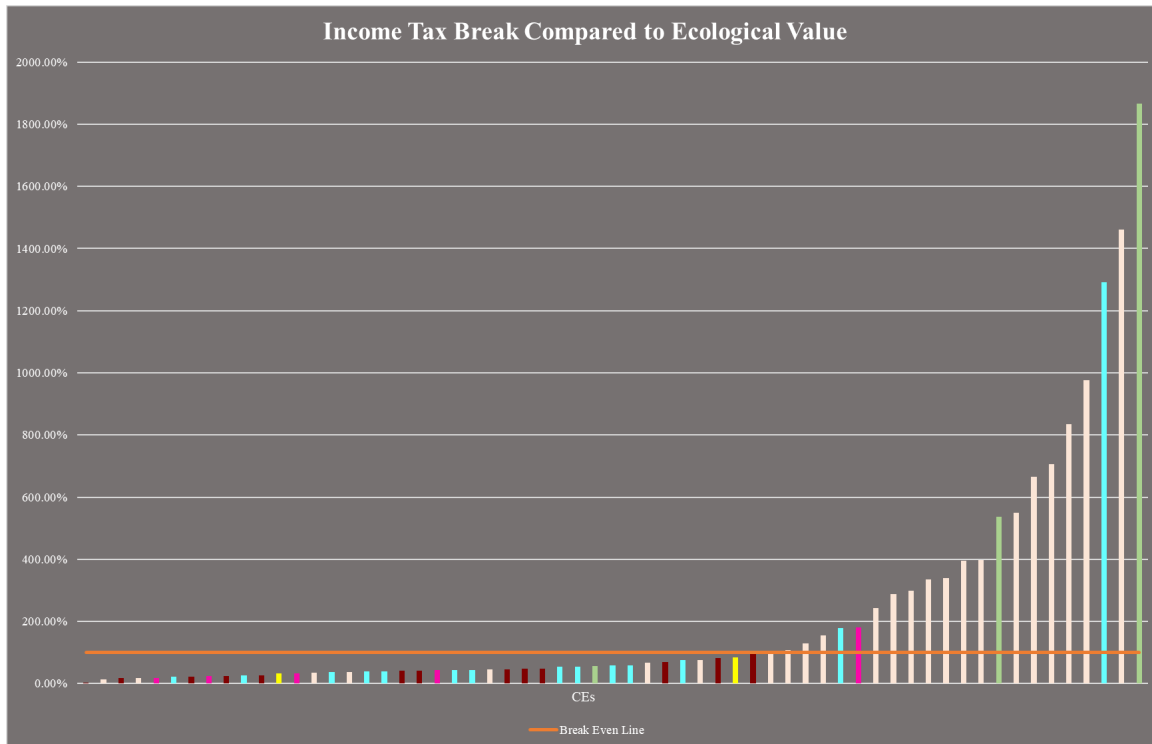
Homesites are always in acceptable development area, meaning that property owners retain the right to “create, maintain, improve, repair, remove, enlarge, or replace” the homesites within the borders of the acceptable development area, however, prior written notice is required. If a reserved homesite is being built, the specific location will be determined 60 days before construction and the location can only be in a few specific locations on the property. For most of the sample, the homesite can be built in agricultural area, but not in any resource protection areas.

70.49% of the sample only allows for 0-1 homesites, but there are some outliers. The most extreme outlier in this sample allows for the construction of 7 new homesites on a property with no preexisting buildings; this particular property is almost 450 acres and the homesites are allowed a maximum total of 6.5 acres, so this is a total of about 1.50% of the property being dedicated to these homesites.

Larger CEs have more room to allow for homeowners to construct large homes without compromising overall conservation efforts. A homesite that takes up 1 acre in a forest seems less harmful than turning that forest into agricultural area and giving the property owner the ability to cut that forest down. Though homesites are a typical focus in the conversation around CEs this particular sample does not point to any outrageous abuses concerning homesites.

CEs that Break Even

Figure 3 CEs that Break Even



Graph *Income Tax Break Compared to Ecological Value* shows the size of all of the properties in the sample, sorted from smallest to largest. The average size of a property in this sample is 291.35 acres.

Now that we have finished viewing the summary statistics, we can now look at whether or not the CEs break even, or in other words if they have a positive present value. Figure 2 shows the CEs that broke even and shows their previous best use.

Of the 61 CEs in the sample, 36.07% of the CEs at least break even, while 63.93% do not. These 22 CEs shared key characteristics with one another, such as the amount of income tax dollars awarded per acre, the property size, the inclusion of a homesite, and the previous best use of the property.

Aspects this Method Does Not Consider and Potential Errors

Though the method used itself has very few issues, the estimated size of the ecological features was calculated by hand using a grid system, so some error can be

expected. Table 12 shows the change in the number of CEs with a positive present value if the ecological benefits were inaccurately estimated. Since the appraisal value is known, the estimated value of the ecological benefits is the only potential source of error in this calculation.

Some concerns over these estimations are that sources are used that are from as early as 1997. Though these numbers have been updated for inflation, it is likely that the values themselves have changed since the study originally occurred. If a policy like this were to be implemented, these numbers would need to be updated. The error estimation table shows how different numbers would affect the outcome of this project.

Additionally, as mentioned in the “Assumptions” section, there are many variables that I would have considered if I could place an estimation of monetary value onto them. There are social considerations that have a subjective value, such as historic landmarks, and then there are other ecological benefits that I could not put a value on, such as cave systems and the presence of threatened species.

A source of value that I do not consider are scenic views, which 34 of the CEs claim as a benefit. Scenic views are a positive externality of the CE. They are also difficult to privatize because they are non-expendable and, almost, non-excludable. It is not profitable to leave a property green and undeveloped but putting up a parking garage is. Though I would argue that scenic views are not the most valuable aspects of these CEs and we should not overpay for them, they do have a value that I am not considering. Scenic views are exactly the kind of thing that a government program should attempt to protect and if there were a way to value them, I would consider them in my calculations.

In addition to not considering positive externalities of the CE, I do not consider the prevention of negative externalities. By preventing development, pollution is

prevented. This becomes the opposite of the tragedy of the commons, where the benefit from preventing the overutilization of a shared resource is impossible to calculate. This potentially explains why no property that listed mining as its previous best use broke even.

It is likely that these aspects resulted in an underestimation of the ecological values mentioned. Table 12 shows what the difference would be if the ecological values are underestimated by 25%, 50%, or 100%.

Table 12 Error Estimations <i>Symmetry Test</i>		
Error Level	CEs with a Positive Present Value	CEs with a Negative Present Value
At current estimation	22	39
If Ecological Values were overestimated by 25%	19	42
If Ecological Values were overestimated by 50%	16	45
If Ecological Values were underestimated by 25%	25	36
If Ecological Values were underestimated by 50%	29	32
If Ecological Values were underestimated by 100%	34	27

Table *Error Estimations* shows the how many CEs would have broken even if the conservation values were overestimated by 25% or 50% as well as if they were underestimated by 25%, by 50%, or by 100%.

Cost and Benefits

Table 13 Average Cost and Benefits Per Acre		
	Average Income Tax Dollars Awarded Per Acre	Average Ecological Value in Dollars Per Acre
Whole Sample	\$ 36,682.00	\$ 18,928.71
Standard Deviation	\$ 35,432.82	\$ 9,602.03
CEs with a Positive Present Value	\$ 5,377.83	\$ 16,353.78
Standard Deviation	\$ 4,786.18	\$ 6,490.07
Only CEs with a Negative Present Value	\$ 54,340.77	\$ 20,381.24
Standard Deviation	\$ 32,898.42	\$ 10,784.06

Table *Average Cost and Benefits Per Acre* shows the average amount of income tax dollars per acre and the average ecological value in dollars per acre. Both calculations are in 2020 dollars.

One shortcut policy to consider is placing a maximum income tax deduction per acre. The CEs with a positive present value awarded less income tax dollars per acre than the sample. Table 13 shows the average income tax dollars awarded per acre and the

sample average is \$36,682.00 per acre. When sorting the sample by the CE's present value, the difference is staggering with the positive CEs awarding almost 7 times less tax dollars per acre than the sample average and more than 10 times less than the negative CEs.

What is even more interesting is the average ecological value per acre. The whole sample has an average ecological value of \$18,928.71 per acre, but the positive CEs actually have a lower ecological value per acre of \$16,353.78. The negative CEs have a higher average than the sample, with \$20,381.24 per acre. For the whole sample, on average, \$1 in lost income tax gets \$0.52 of ecological value per acre. For the positive CEs, \$1 in lost income tax gets \$3.04 in ecological value. And for the negative CEs, \$1 in lost income tax gets \$0.38 in ecological value. This means that the return on investment is over 8 times greater for positive CEs than negative. Looking at these averages together suggests that the CEs that break-even do so not because they are placed on properties with a higher ecological value, but instead because they are cheaper to acquire than other CEs.

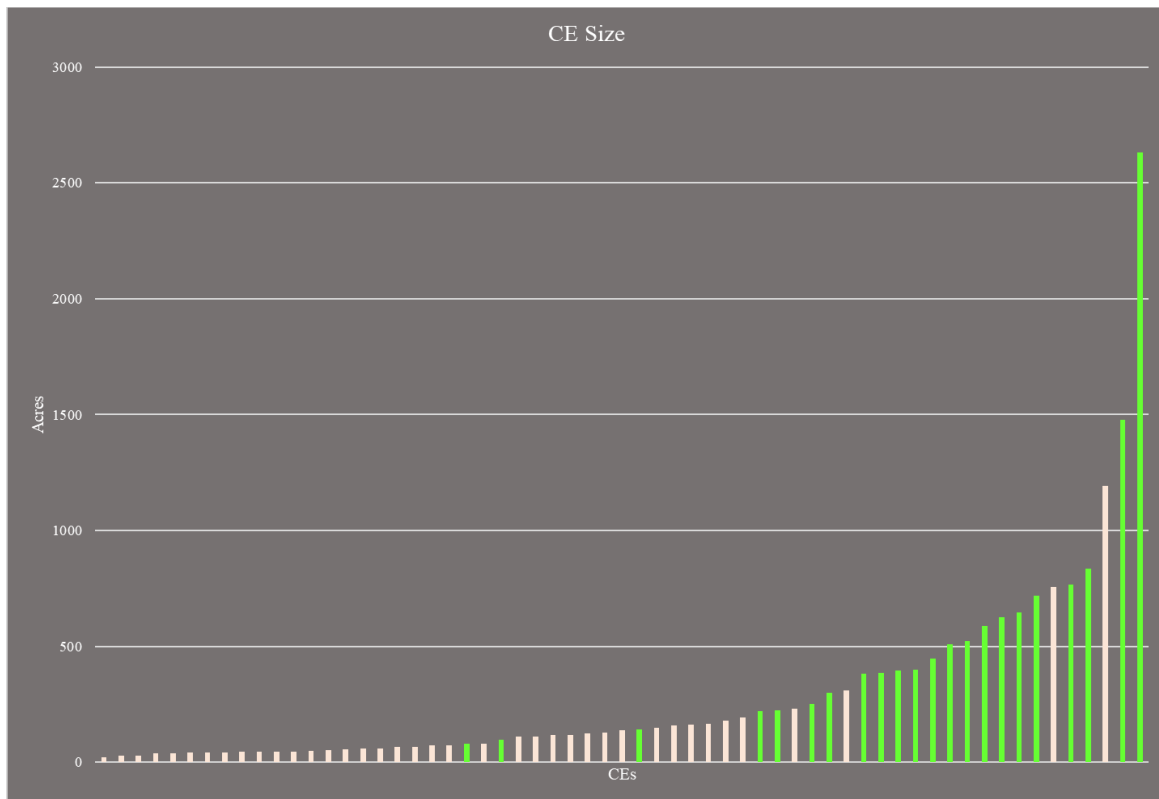
19 CEs fall under \$10,000 in lost income tax per acre and all of those 19 CEs have a positive present value. If those 19 were the only CEs approved, then every \$1 of lost income tax dollars would result in \$4.27 of ecological value per acre. If that limit were increased to \$15,000, that amount would go down to \$3.06 in ecological value per acre for every \$1 in lost income tax dollars. Most of the CEs in the sample with a positive present value fall under \$13,000 in lost income tax dollars per acre.

If a shortcut policy were to be implemented concerning lost income tax dollars per acre, then location needs to be considered. The donated development rights will have

a different value depending on where the property is located. In this sample a cap of \$10,000 in lost income tax per acre makes sense, however, it would likely not make sense for every CE across the nation. Perhaps this cap can be calculated based on the average property value in different locations. That way, demand for the program will not be too high in areas with low property values and non-existent in areas with high property values.

CE Size

Figure 4 The Sizes of CEs that at Least Broke Even Graph



Graph *CE Size* shows the individual size of the properties in acres. The smallest property is 21.89 acres and the largest is 2629.70 acres. The green lines are the 22 CEs which broke even. The smallest CE that broke even was 79.55 acres and the average size of the CEs that broke even were 574.21 acres.

Another shortcut policy consideration is whether or not a minimum size requirement should be implemented for the properties the CEs are placed on. The CEs which broke even tend to be larger than the other CEs. Table 14 shows the difference in means of the sizes of the properties with CEs that broke even and the properties which

did not break even. On average, the CEs that broke even were placed on larger properties, which suggests larger parcels of land benefit from increased returns to scale to the land's ecological values.

For the whole sample, the average size of the property a CE was placed on is 291.35 acres. The mean for only the CEs that broke even is almost twice that of the whole sample and the mean for only the CEs that did not break even is almost half of that of the sample.

Of the 22 properties over 200 acres, 18 of the CEs placed on those properties have a positive present value and 4 do not. If a policy was implemented that required a CE to be placed on a property 200 acres or over, then \$1 of lost income tax dollars would result in \$1.85 in ecological value. Overall, we would gain value regardless of the 4 CEs in the sample that did not break even.

Table 14 CE Size Statistics Part II			
	Whole Sample	CEs with a Positive Present Value	CEs with a Negative Present Value
Mean	296.23 acres	574.21 acres	139.42 acres
Median	138.23 acres	433.10 acres	65.17 acres
Minimum	21.89 acres	79.55 acres	21.89 acres
Maximum	2629.70 acres	2629.10 acres	1194.00 acres
Standard Deviation	424.28 acres	553.09 acres	212.62 acres
Total	61 properties	22 properties	39 properties

Table *CE Size Statistics Expanded* compares the mean, median, minimum, and maximum between the sizes of the properties with CEs with a positive present value and the CEs with a negative present value.

The effectiveness of a CE's conservation efforts is impacted by the property's size. This suggests that favor should be given to larger properties and there should be a minimum size requirement in order for CEs to be eligible for an income tax deduction. If a minimum size requirement were added, however, the IRS would automatically reject some CEs that would have been good deals. One solution to this could be to add an

application process for exceptions to be considered. These could be property owners who hire their own surveyors to prove that their CE would break even. We may also consider exceptions where the property is small but is contiguous to a national park or other public land. These properties may not break even themselves and may not have the minimum size requirement, however, they would enhance the value of other protected properties by increasing those efforts.

Homesites

Setting a maximum per acre tax award and setting a minimum property size are clear improvements over the current problem. My next suggestion is not as black and white; however, it is a worthy topic of conversation. I believe there should be a requirement to place a homesite on a CE. CEs with homesites broke even more often than CEs that did not allow for homesites. Looking at Table 15, only 20% of the CEs with no homesites broken even while 47.22% of the CEs with at least 1 homesite broke even.

Table 15 CEs with Homesites <i>Part II</i>	
Homesites #	Number of CEs
0 Homesites	25 CEs
CEs with a Positive Present Value	5
CEs with a Negative Present Value	20
1 Homesite	18 CEs
CEs with a Positive Present Value	9
CEs with a Negative Present Value	9
2 Homesites	11 CEs
CEs with a Positive Present Value	3
CEs with a Negative Present Value	8
3 Homesites	5 CEs
CEs with a Positive Present Value	3
CEs with a Negative Present Value	2
4+ Homesites	2 CEs
CEs with a Positive Present Value	2
CEs with a Negative Present Value	0
Total	61 CEs

Table *CEs with Homesites Part II* sorts the number of CEs by the number of homesites on each of the properties. Underneath each homesite, the CEs are sorted by the number of CEs that broke even.

Obviously having a homesite on the property is not an ecological value. However, homesites allow for the property to still be lived on and thus to still have someone to take care of the property. These restrictions are placed in perpetuity and not placing a homesite on the property at the inception of the CE prevents that property from ever being inhabitable. It is important to be skeptical when placing homesite in order to ensure that the CE just creating luxury mansions, however, we need to be sure to not over correct and place no homesites on a property.

Previous Best Use

Finally, previous best use also trended between the CEs with a positive present value. I am not prepared to make a shortcut policy suggestion because there are additional unknown variables, however, these trends should be considered further. It is unclear what is the relationship between previous best use and the value of the CE as an investment. This is abundantly clear in the case of mining properties.

Table 16 Source of Appraisal Best Use		
Use	Number of CEs	CEs with a Positive Present Value
Residential	23	16
Mixed Use	14	3
Mining	13	0
Commercial	5	1
Agriculture	3	2
Other	2	0
Total	61	22

Table *Source of Appraisal Best Use* sorts the sample by what the appraisal claimed was the best use of the property, meaning the use that would maximize the value of the developmental rights. Mixed Use means that the Appraisal based its calculations off of a mix of both residential and commercial use.

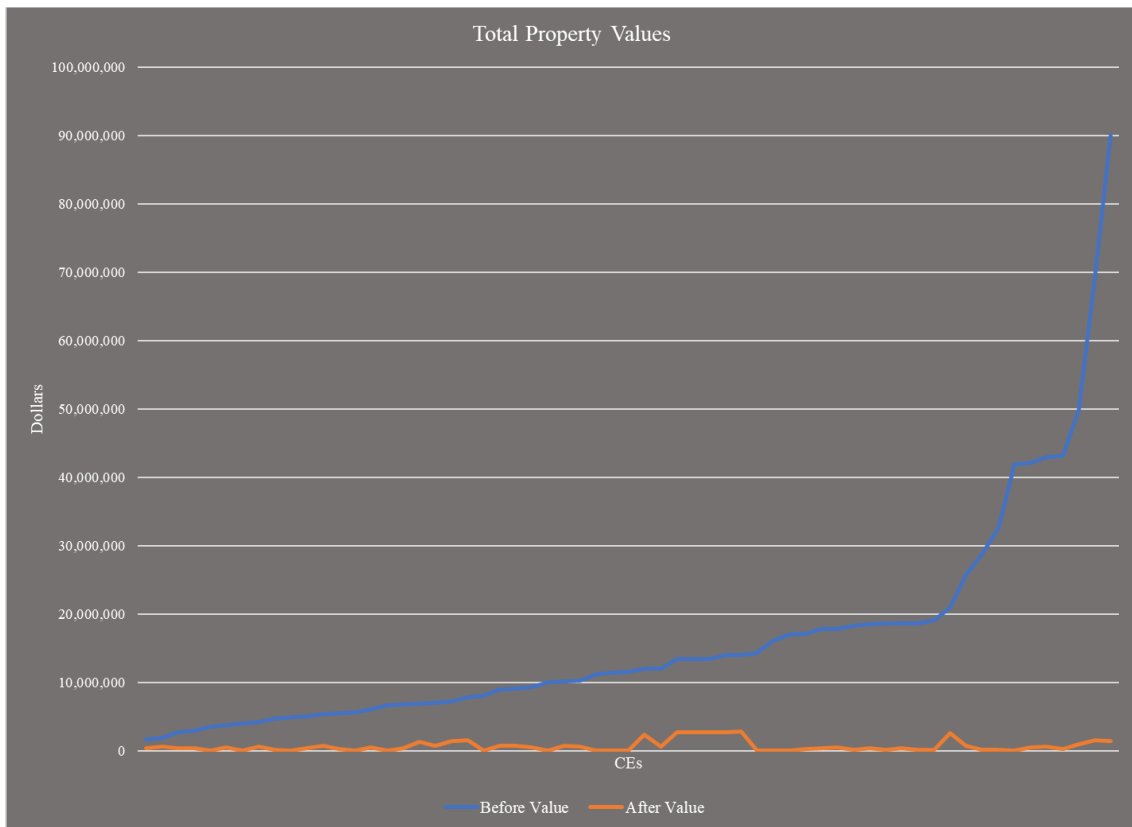
Table 16 shows that there were no CEs that broke even on property which listed mining as its previous best use. Perhaps this just means that society needs to overpay if we want to prevent the harms from mining. Or, another possibility, is that I have no method of valuing the prevention of the negative externalities associating with mining.

Additionally, I have no way to value the ecological benefits of cave systems and as a result my calculations may have a bias against the ecological values of those properties.

Also, the most common previous best property uses for the CEs with a positive present value was residential development. This could mean that residential properties are simply more common and less expensive to obtain. Or it could also mean that the ecological benefits on residential properties are more straightforward to calculate. Because there are many remaining questions concerning the relationship between previous best use and the CE's present value, more research needs to be done before specific policies can be suggested for addressing these trends.

Before vs After Property Values

Figure 5 Before vs After Value of the Property Graph



Graph *Total Property Values* shows the appraised before and after values, sorted by ascending before value. The difference between the before and after value is the appraised value of the CE.

Because of the trends among the CEs that broke even, I wanted to test if the CEs that broke even happened to have a lower opportunity cost than the CEs that did not break even. This is significant because it would mean that the CEs that broke even mainly broke even because their development rights were worth less. We already know the CEs that broke even had a lower income tax dollar award per acre on average, however, we do not know where that lower award came from. One possibility is that this came from the appraisal and the difference in before and after values.

The opportunity cost is determined by comparing the before and after value on the appraisal. Figure 4 shows the before value and the after value, with the difference between the two lines being the value of the CE as a donation or, in other words, the opportunity cost of the lost development rights of the property. In this case, the opportunity cost is the price to society because the opportunity cost is what the IRS bases its income tax deduction on.

In addition to determining the whole sample's opportunity cost, because no mining properties broke even, I was interested in any difference between the value lost on properties who claimed mining as their previous best use and non-mining properties. And since residential properties made up the largest percentage of the CEs that broke even, I was also interested in difference in value lost on residential and non-residential properties.

In Table 17, I show the sample average as well as the differences in averages between the aforementioned groups. The first analysis is the minimum, maximum, and mean of the whole sample. Then there are 3 tests which sort the sample into the properties with CEs that broke even and those with CEs that did not, mining and non-mining properties, and then residential vs nonresidential properties.

In this sample the properties lost 92.68% of their value on average once the CE was placed. For only the properties with CEs that broke even, the mean is smaller than the mean of the whole sample, but only by about 2 percentage points. There is no notable difference between the percentage of value lost from placing the CE on these properties.

Table 17 Property Value Lost due to CE	
Entire Sample (n=61)	
Minimum	67.00% of Value Lost
Maximum	99.84% of Value Lost
Mean	92.68% of Value Lost
Standard Deviation	8.00 percentage points
Positive Present Value (n=22)	
Minimum	67.00% of Value Lost
Maximum	99.58% of Value Lost
Mean	90.23% of Value Lost
Standard Deviation	7.54 percentage points
Negative Present Value (n=39)	
Minimum	80.00% of Value Lost
Maximum	99.84% of Value Lost
Mean	94.06% of Value Lost
Standard Deviation	8.01 percentage points
Mining Properties Only (n=13)	
Minimum	97.02% of Value Lost
Maximum	99.43% of Value Lost
Mean	98.54% of Value Lost
Standard Deviation	0.72 percentage points
Non-Mining Properties (n=48)	
Minimum	67.00% of Value Lost
Maximum	99.84% of Value Lost
Mean	92.95% of Value Lost
Standard Deviation	8.26 percentage points
Residential Properties Only (n=23)	
Minimum	67.00% of Value Lost
Maximum	99.68% of Value Lost
Mean	92.77% of Value Lost
Standard Deviation	7.98 percentage points
Non-Residential Properties (n=38)	
Minimum	80.00% of Value Lost
Maximum	99.84% of Value Lost
Mean	92.63% of Value Lost
Standard Deviation	8.12 percentage points

Table Property Value Lost due to CE shows the percent of property value lost when the development rights were lost on the property.

Similarly, mining properties had an average that was 6 percentage points lower than the average for non-mining properties. I initially hypostasized that the properties that listed their previous best use as mining were bringing up the average value lost because I believed the opportunity cost of having minable minerals on the property exceeded the opportunity cost of other previous best uses, however, this does not appear to be the case. There is no significant difference found between the percentage of property value lost on mining vs non-mining properties.

As for residential vs nonresidential properties, their means are almost identical. Since there are no differences in any of the means in these 3 tests, the CEs that broke even did not do so because of a decreased opportunity cost of the property. Rather, the development rights lost on the property are comparable, but the before value is significantly smaller for properties with CEs that broke even.

Table 18 Average Appraised Before Value per Acre		
	Mean Before Value per Acre	Standard Deviation
Whole Sample	\$ 157,720.10	\$ 150,100.62
Only CEs with a Positive Present Value	\$ 22,920.56	\$ 19,205.92
Only CEs with a Negative Present Value	\$ 233,760.87	\$ 137,534.66

Table *Average Appraised Before* shows the average appraised before value per acre and the standard deviation for the whole sample, only the CEs with a positive present value, and only the CEs with a negative present value. All calculations are in 2020 dollars.

Table 18 shows that the sample average before value is \$157,720.10 per acre. For the CEs that broke even, that average is around \$130,000 smaller per acre at \$22,920.56 per acre. The CEs that did not break even were placed on properties with an average before value of \$233,760.87 per acre, with is around \$75,000 higher than the sample average. An independent samples t-test for the shows that the p-value is less than 0.0001, meaning there is a 0.01% chance that the difference in the averages between the two categories of CEs is due to chance.

As mentioned before in Table 18, both the properties with positive and negative CEs lost an about equal amount of value when the CE was placed. However, the properties at least broke even started at a lower before value than the CEs that did not. One of the potential reasons for this could be because the properties with a more expensive before value are better suited for development and have less ecological values overall. If a property is a vast empty space with no trees, wetland, or body of water then there are less construction costs associated with development. However, land with a high conservation value may be more difficult to clear out for construction. Another reason may be the geographical location of the property. If a property is located in a city, for example, the benefit to development would likely be higher than development in a suburb. On top of that, it is not exactly easy to find lush forests in between the skyscrapers in Chicago. However, if this is the reason that some of these CEs are not breaking even, then we should consider if it is worth overpaying to preserve ecological properties in an area where there is likely a shortage.

Further research should go into the relationship between the appraisal's before value and location of the property. Because of the size of this sample, I could not run this analysis without risking identifying confidential information for individual CEs. It is likely that the properties with a higher before value fell into a specific region with higher property costs and less valuable ecological features. I cannot make a shortcut policy suggestion based on before value because there are too many unknown variables.

Conclusion

When CEs function the way they are meant to, they serve as powerful tools for ecological conservation. However, because the corresponding income tax deductions are so generous, bad actors are attracted and they misuse society's resources. Looking at a sample of 61 randomly selected syndicated CEs from the Atlantic Coast Conservatory, 22 of these CEs have a positive present value while 39 do not. On average, \$1 of lost income tax dollars gets \$0.52 of ecological value per acre. The CEs that broke even tended to award less income tax dollars per acre, to be larger than the CEs that did not, they had at least 1 homesite, their most common previous best use is residential development, and they have a lower before value than the CEs that did not break even.

From a policy perspective, Congress should require the IRS runs an analysis on approved CEs for trends every decade to update the tax code. The trends in this dataset suggests that the tax code should be amended to require a minimum property size and a maximum award of tax dollars per acre. These policy shortcuts are based off of common features in CEs with a positive present value and would increase the likelihood of a CE at least breaking even.

The goal of offering a tax incentive for CEs is to incentivize these ecological protections, however, now the tax incentive has become the main focus of the conversation. The conversation around CEs should refocus on the ecological features we want to protect and on methods that can be used to place a monetary value on them.

Appendix

Numbers Used from Exhibit 2 of Jessica Sargent-Michaud's report with The Trust for Public Land				
Ecosystem Types	Ecosystem Services	Value per acre (\$2008)	Value per acre (\$2020)	Source
Emergent Herbaceous Wetland	Flood control, water supply; fish and wildlife habitat; recreation; aesthetics	\$784	\$941.94	Roberts & Leitch, 1997
Woody Wetland	Flood control, water supply; fish and wildlife habitat; recreation; aesthetics	\$784	\$941.94	Roberts & Leitch, 1997
Deciduous Forest	Grazing; carbon sequestration; habitat provision	\$879	\$1,056.08	Ingraham & Foster, 2008
Evergreen Forest	Grazing; carbon sequestration; habitat provision	\$879	\$1,056.08	Ingraham & Foster, 2008
Mixed Forest	Grazing; carbon sequestration; habitat provision	\$880	\$1,057.29	Ingraham & Foster, 2008
Open Water	Fresh water regulation and supply; habitat provision	\$267	\$320.79	Ingraham & Foster, 2008
Agriculture	Aesthetics; crop production; grazing	\$283	\$340.01	Rosenberger & Walsh, 1997
Altered or Disturbed	None	N/A	N/A	
Oil/Mine/Quarry	None	N/A	N/A	

An Example of The Grid Method Used to Estimate the Areas on the 61 Properties

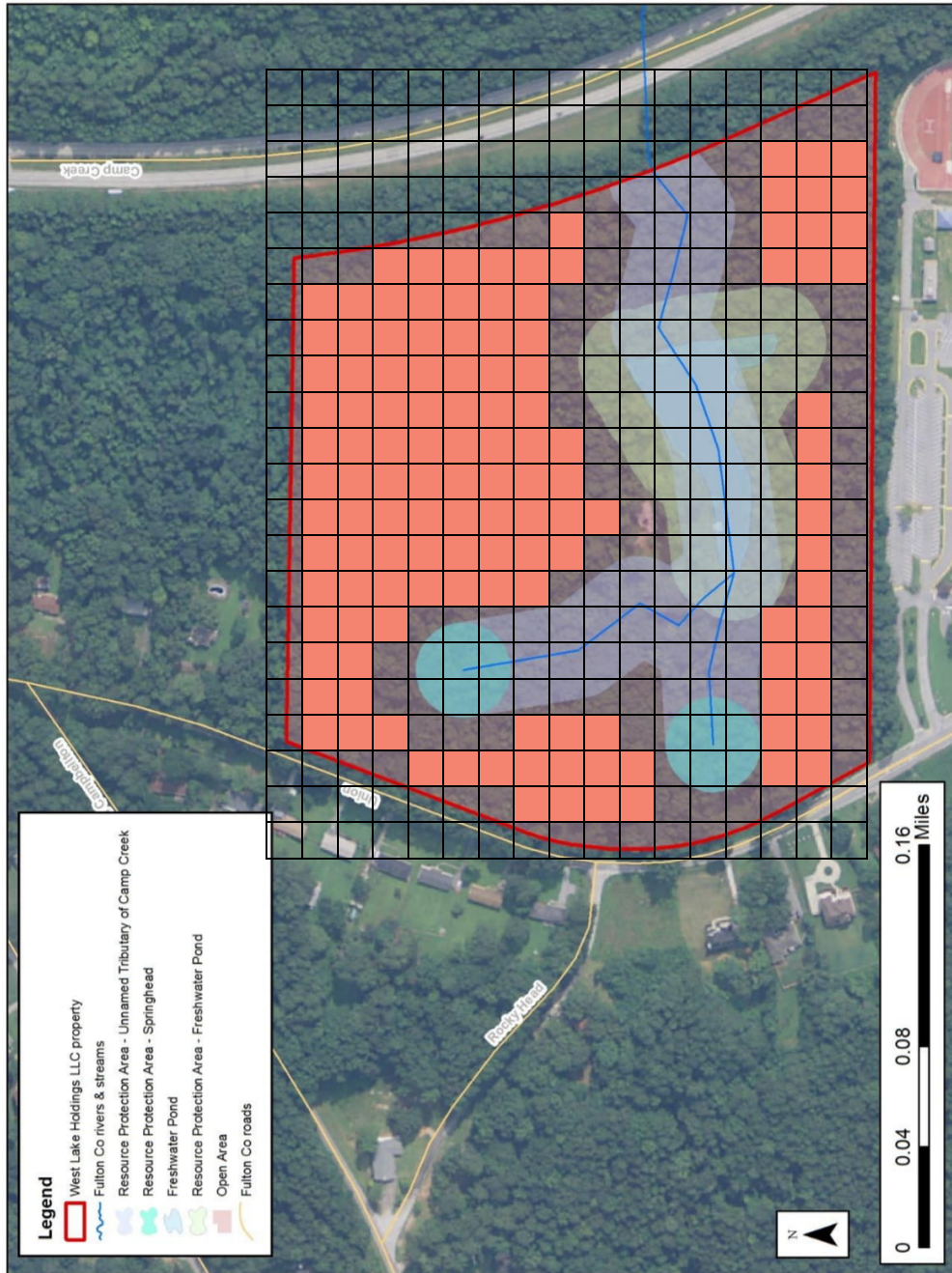


Figure 21. Conservation easement map depicting spatial location of the Open Area (in coral) (1:3,000 scale).

Total: 283
 Open Area: 190
 Pond and Buffer (overlap): 29.5
 River and Buffer (overlap): 52.5
 Springhead: 11

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