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## **Paradigm Shifts in Land Preservation and Conservation: The Essential Modern Discourses**

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**Abstract:** Mechanisms for protecting land in the United States transitioned from fee-simple government purchase to non-profit management through private ownership and conservation easements. Instead of creating large national parks as untouchable museums of ecology, the modern land protection paradigm channels public funding, creative partnerships, and an emerging understanding of the working landscape and complex ecological processes. On a macro scale, the paradigm shift seems to be successful: funds are raised and more land is being protected. However, management decisions are being dictated by complex and often tenuous interdisciplinary relationships.

This paper examines the objectives and challenges faced by three integral players in the modern land protection paradigm: the academic, the executive director, and the land steward. Optimal land management is achieved through land stewards executing best management practices on protected land. These practices must be informed by research from the scientific community. And, executive directors must obtain funding for land protection and land management. Thus, successful stewardship of land depends on the collaboration of these disparate professions through education, participation on boards, open discourse, and a commitment to public outreach. Therefore, a variety of discourses in land protection must be in dialogue to appropriately safeguard land for people today and tomorrow.

**Keywords:** land preservation, sustainability, conservation

## Introduction

Many communities at regional and local levels are recognizing the importance of land preservation as perpetual protection of land. Individuals may search for a national park to visit, walk along local protected creeks, or drive by the newly erected sign on the edge of a farm that is now safeguarded from development. But is our current notion of land preservation correct? Literature documents efforts since the 1800s seeking protection and restoration of the landscape, but the current scope of land preservation is much broader. This history informs individuals working in diverse fields. However, today, we must consider the new challenges and face them proactively. By focusing on the individual discourses of those working in land preservation, we realize that their work is often contrary to their ultimate goal of permanent environmental health. Instead of protecting more land, developing new habitat, or aiding policy, these individuals are struggling with political whims, making the payroll, and spraying pesticides. There are several important practitioners that make up this interdisciplinary field, including academics, government officials, financiers, executive directors, educators, ecologists, and computer technicians. It is imperative they work in concert to achieve the collective goal of preserving land. By understanding a few of the perspectives and the work they do, we can begin to construct a more complete notion of what land preservation is to become.

This paper aims to elucidate the historical evolution of land preservation in the United States and explain three interdisciplinary discourses within land preservation in the twenty-first century. The historical and cross-disciplinary background of land preservation informs much of the work done in the field today. By examining these three distinct positions within the field — the academic, the executive director, and the land steward — and the divergence between historical theory and actual practice, we can debunk pre-conceived notions of land preservation. While other views of preservation require equal consideration, these three perspectives can begin the important discussion of land preservation as an evolving and possibly threatened design. A holistic understanding of the challenges faced by these professionals can inform future efforts to influence new policy, encourage philanthropy, and restore the degraded ecosystems necessary for successful land protection.

## Historical Protection of Land in the United States

Land Preservation in the United States has a historical basis from the 1800s<sup>1</sup>. While it divided into two separate segments, preservation and conservation, a national approach to protecting land was internationally apparent. Although these two terms have significant differences with respect to management practices, they achieve the same goal of perpetual protection, and are often used interchangeably. Initially, the government was solely responsible for preservation, but while they still hold an important role in managing all land, today the government and non-governmental organizations (NGOs) share the responsibility.

The distinctive American philosophy of preservation began with Henry David Thoreau's famous words from his essay *Walking*: "in Wildness is the preservation of the world" (Thoreau 1862). This statement captures the moment that America began to wonder about the state of our natural landscape and the rapid destruction of what was, until then, considered a never-ending and indestructible resource. Thoreau voiced the need for solitude and wildness, the uplifting spiritual qualities of nature, and the fundamental human connection to nature.

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<sup>1</sup> It could be argued that the first protected parcel of land was Boston Common on March 30, 1640 (Howe, 1910).

John Muir, founder of the Sierra Club, focused Thoreau's wilderness concept on the Sierra Nevada Mountains of California and, in doing so, he spoke for a movement that was to spread across the nation. In Muir's time, massive swaths of land were developed or relinquished to railroad companies. The exploitation of natural resources took precedence as dams were built for water supplies, electricity, and flood control. Minerals and trees were extracted with wanton disregard for environmental consequences. Speaking of the Sierras, Muir said, "Mountains holy as Sinai. No mountains I know of are so alluring. None so hospitable, kindly, tenderly inspiring. It seems strange that everybody does not come at their call. They are given, like the Gospel, without money and without price. 'Tis heaven alone that is given away" (Teale 2001). To Muir, the mountains were a religion, a sanctuary. Destroying this temple was tantamount to sacrilege. Muir's quest for preservation positioned him as the most outspoken proponent of the national park system, a movement born of his activism. The first national park, Yellowstone, established in 1872, was decreed as "a park or pleasuring-ground for the benefit and enjoyment of the people." It would be decades before the second and third parks—Sequoia and Yosemite<sup>2</sup>—were included in 1890 (US Department of Interior 1940).

National and state parks, wilderness areas, and their managing organizations epitomize the early preservation movement. These places serve as national museums that attempt to keep the land as close as possible to the state that existed prior to North America's colonization (Tilden 1976). In other words, rather than actively conserving timber, water, and coal, national parks conserve mountains, lakes, canyons, wildlife, and trees.

However, permanent protection can still have economic value. Resources such as trees, minerals, water, and grasslands represent revenue. Conservation allows for a regional plan to create a sustained flow of resources from a mountain, river, or valley in perpetuity. And with the creation of thirteen new forest reserves in 1897, the U.S. Forest Service was born. A new era characterized by conservation began with the publishing of *Use of the National Forest Preserves* in 1905. This book opened the forest reserves — including the timber, water, pasture, mineral, and other resources — to everyone, under reasonable conditions. The purpose of the reserves was to conserve perpetual supplies of timber and prevent destruction of the forests alongside streams. The beneficiaries of these commons were the people, not the government. The idea was forward thinking ensuring resources for the future. Maintaining this perpetual supply would ensure national prosperity and safety indefinitely (Pinchot 1947).

It was not until the 1960s that conservation had its first major paradigm shift within the national forests. With the introduction of the Multiple Use Sustained Yield (MUSY) Act of 1960, the United States Congress mandated that the national forests be administered for a range of uses including outdoor recreation, range, timber, watershed, wildlife, and fishing (Public Law 86-517). MUSY marked the beginning of functional plans for each resource, experimentation with zoning of land uses, and the requirement that rangers create district use management plans (Wilkinson 1987). The multiple-use model — which to some degree has been subsequently adopted by non-profit organizations — ensures that houses cannot be built, that renewable natural resources are harvested or used in a sustainable way, and that recreation and wildlife remain primary considerations for the land in question. Forest plans operating under this model ensure that the timberlands are not ravaged by clear-cuts and high-grading. Local communities are considered so they can prosper with secure local timber supplies for their mills. In addition, associated businesses, which complement the timber industry, can also remain sustainable. In

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<sup>2</sup> While not the first national park, portions of the Yosemite Valley were protected and endowed to the State of California by President Lincoln and Congress with the signing of the Yosemite Grant Act on June 30, 1864 (U.S.C., 1864).

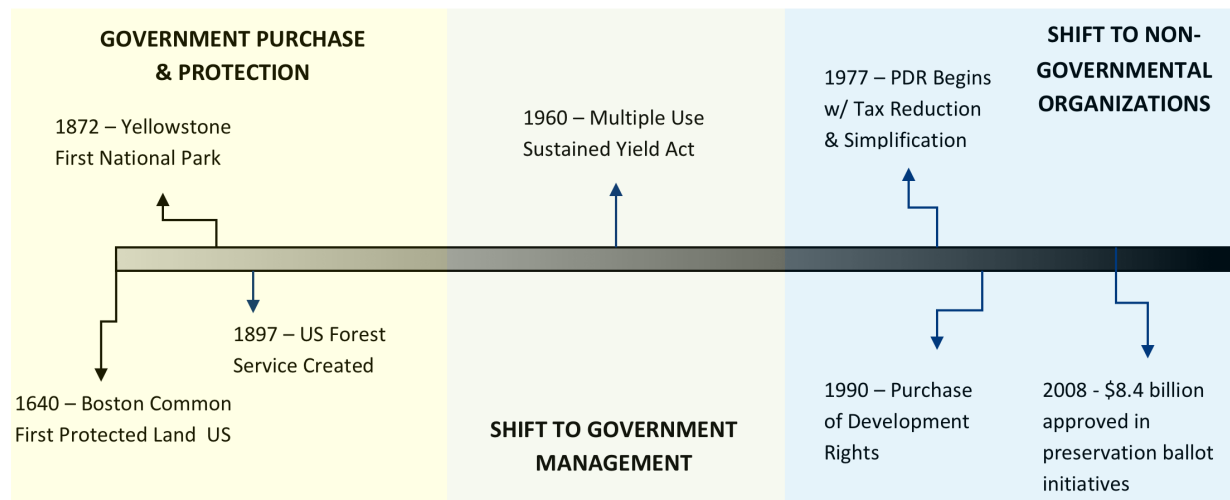
short, economic prosperity is secured as harvests continue, taxes accrue on the land parcels, and populations are drawn to the region for recreational opportunities (Moscovici 2014).

The ideas behind MUSY challenges historical preservation (i.e., leaving land untouched) as a solution to sustainability. For local economies and citizens, there are economic drawbacks to preservation without adaptation for change. People are concerned about the loss of tax revenue for the local communities. Although parks are physically located in municipalities, the federal and state governments own national and state parks, respectively. These lands are often exempt from local property taxes, but the costs for public services — police and fire protection, waste disposal, water supply, and road construction — are funded by the local citizens. People living near parks also fall prey to a vicious cycle: they work in seasonal, underpaying tourism jobs and are frequently affected by inflated retail costs, increased real estate costs, and higher property taxes. In a sense, local residents become second-class citizens, at an economic disadvantage compared to a less variable, more consistent natural resource base (Vail 2004).

The problems associated with climate change are already affecting the National Parks and the wildlife residing in them. The main issue is that in theory the parks are historically preserved. Aside from budgetary constraints, working within the confines of the Endangered Species Act, environmental laws of the 1960s and 1970s, and the 1998 National Parks Omnibus Management Act can be difficult as anthropogenic impacts on climate change were not considered during the writing of the laws (Gross 2008). These issues are still being conceptualized, which quickens the paradigm shift towards multiple use of the land under a public/private partnership. Even though the goal of perpetual protection persists, MUSY helped develop an evolution or paradigm shift of how and why we protect land. Although the federal government is still responsible for managing all it has protected until today, land trusts and non-profit organizations are now and will continue to be significant actors in land preservation and conservation moving forward. Their actions can be more flexible with respect to climate change and wildlife management on these properties.

## **Land Protection Today – Paradigm Shifts**

There has been a significant paradigm shift in land protection, which is considerably more complex than in the late 1800s and early 1900s. While the government holds and manages a great deal of land for all citizens of the future, there are currently specialized techniques to identify, market, finance, and write conservation easements (Diehl 1988). In addition to historical fee-simple purchases, the purchase of development rights (PDR), also known as conservation easements, has become a major tool for protecting land, while using limited funds. Today, parcels are protected for a variety of reasons, including historic viewsheds, agricultural land, recreational corridors, waterfronts, islands and other natural areas, habitat, and other working landscapes like forestry, ranching, and mining (Gustanski and Squires 2000). Funding, implementation, and continued monitoring come from a variety of levels and the roots of protection are no longer only governmental (federal, state, and local) but also non-governmental (Daniels and Bowers 1997). It is a new era of safeguarding land for the future. It is characterized by an epoch of cooperation and swift decision-making, in which multi-disciplinary actors are taking the field into a new directio

**Figure 1: Major Historical Events and Paradigm Shifts in Land Protection**

Within this paradigm shift there are specific changes. One of these is the consideration of economic impact. For instance, the greenbelt in Boulder, Colorado, increased aggregate property values by \$5.4 million more than if there was no greenbelt (Correll et al. 1978). Preserving land, rather than developing it, significantly reduces public services and infrastructure costs. Keeping the land as open space results in net positive tax revenue for communities (Crompton 2007) because people are willing to pay more to be near open spaces (Geoghegan, 2002) and because these lands often produce goods and services with economic returns to the land owners and the region (Fausold and Lilieholm 1996). Furthermore, permanent protection is three times more valuable than open space that could be developed in the future (Irwin 2002). Protected lands also generate revenues in hopes of achieving local sustainability.

While local money is being generated, land is becoming more expensive. As a result, trends in conservation shifted away from fee-simple land purchases. Buying a property fully is a valuable tool, but it is a limited strategy. There are many drawbacks to outright acquisition. The first and most obvious is the sheer cost. Realistically, it is not possible to afford all the land that should be conserved, and there continues to be a scarcity of funds for conservation. Second, acquisition frequently results in a mismatch of priorities between buyers and sellers, and encourages a retroactive planning approach. Third, the fee-simple process obscures the link between public and private goals. Tax breaks, incentives, and the multiple ownerships and management techniques in preserved parcels create a mix of public and private actors with blurred lines. Finally, purchasing does not guarantee control. Property claims are only as good as the general community's recognition of the legitimacy of that claim, especially if the parcel is large and rarely visited (Fairfax et al. 2005).

The first private, tax-exempt regional land trust was created in Boston, the Trustees of Public Reservation, in 1891 (Levitt 2007). But, the paradigm shift toward the purchase of conservation easements, or PDR, started in 1977 with the passage of the Tax Reduction and Simplification Act. Requirements for contributions of real property interests demand the provision of a public benefit or furthering government conservation policy. This tax write-off was the beginning of open space or natural habitat easements (Lafond 2011) and accelerated around 1990. Under this model, only one right in the "bundle of rights" that a landholder owns is sold or donated.

Other rights aside from development rights include air rights, mineral rights, and timber rights. These easements can be very expensive and the availability of financial resources is still a major problem, especially for financing large-scale conservation. The next twenty-five years may be the last chance to preserve critical open space in the United States (Levitt 2003). When it comes to preservation, priorities should be on landscape scale-ecological land units, where intact blocks of forestland transcend political boundaries (Lapping and Furuseth 2004). The idea is that conservation financing can be applied at the scale of nature (Ginn 2005). While it is a pay-for-environment approach, such win-win situations frequently result in reinvestment into the working landscape and a multiplier effect for local related industry, continuing a cycle of working landscapes and sustainable forestry (Lind 2001). However, every small parcel counts.

People are indicating that land preservation is a more sustainable option. People want to preserve the family forest for future generations, ensuring that their heirs do not turn the parcel into a large-scale development, or they may want to profit from the significant tax benefits in their retirement years (Small 2002). Also, people are recognizing the many associated benefits and are speaking through their votes. Several bond initiatives and voluntary taxes on communities and states show that citizens are willing to pay for preservation with their tax dollars. From 1998 to 2002, 668 measures passed approving conservation finance measures, which resulted in the generation of almost \$25 billion for land protection. This significant funding must not be overlooked in the treasury for land preservation (Hopper and Cook 2004). Interestingly, most of these conservation easements have been applied in the eastern half of the United States, since most of the owned federal land lies west of the Mississippi River (Wilkinson 1987). More recent findings demonstrate similar results: citizens, on a local level, want land preservation. In 2008, 71% of ballot measures for land preservation were approved nationally, totaling \$8.4 billion in funding for the year (Land Trust Alliance 2009). The federal government is still a major financier, funding already protected parcels and tens of millions of dollars of new conservation easement matching funds from the Land and Conservation Fund, amongst other sources. Financing has become one of the most important considerations in the preservation/conservation fields.

## **Essential Discourses in Modern Land Protection**

There is a need for a new conceptualization within land preservation that recognizes the challenges faced by those working in the field and the mismatch of day-to-day efforts relative to large-scale conservation goals. But, the discussion of the multi-disciplinary actors within the field of land protection is currently missing from the literature. The professions involved in the field of land preservation include academics, government officials, financiers, executive directors, educators, ecologists, and computer technicians. All work towards the collective goal of natural resource protection through land preservation. In addition, while these professionals often work independently, their individual successes are frequently interdependent. Each of these jobs has a distinct role and faces a unique set of challenges teeming with twenty-first century problems. These difficulties must be studied, analyzed, and overcome to optimize land preservation efforts and ensure sustainability over the long term.

This paper focuses on three integral roles within this process: the academic, the executive director, and the land steward. Between these individual efforts exists a bridge from the historical and theoretical philosophy of conservation to day-to-day land preservation and management challenges. Academics strive to develop relevant research that will gain widespread publication and inform policy decision-making. By studying species and lands of concern, identifying multiple use criteria, and otherwise furthering our understanding of

ecological systems, academics hybridize education and scientific research. Alternately, executive directors must make decisions about land acquisition and raise necessary funding while continuing to integrate new technologies like Geographic Information Systems (GIS), handling personnel actions, and balancing the wishes of board members. Finally, land stewards work nearly autonomously, contending with the challenge of restoring pieces of the native ecosystem in what are often heavily fragmented and degraded landscapes.

Investigation into the discourses of professionals in each of these roles reveals the complexity of the modern land protection paradigm. The following sections provide narratives from the perspective of each of these roles. Like many of the integral contributors to the conservation process, these professionals operate in separate and isolated spheres. By understanding more about the specialized roles required to protect land we can find ways to connect these groups and optimize their collective efforts.

### *Eliciting Change – An Academic’s Perspective*

For an academic, employed by a college or university, one of the major goals is to produce relevant research. An academic may then hope to publish their work in a prestigious journal within their field. But do such publications receive widespread readership? Even if other academics take the time to read the work and build upon the research, the ideas may never reach those making decisions about land protection. If research is going to have a practical impact on policy decisions, this cannot be accomplished through academic circles alone. Therefore, academics present their research at conferences, give lectures, and educate students in the hope of creating a more informed public and subsequently affecting political actions. However, relating specialized concepts to a public that is not well versed in a subject presents its own set of problems. Often concepts that must be understood are counterintuitive or contain inherent complexities that make them difficult to explain in the time available. Furthermore, new research may be in opposition to current public consensus, which is often built on myths and half-truths rather than well-researched peer reviewed data. Although academic expertise is often valuable on land trust boards or government think tanks, the time of many academics is already stretched by classroom and administrative responsibilities. Despite these challenges, many professors and scholars continue to work towards the common goal of protecting land, believing that if their research is implemented it will benefit future generations.

Research methodology begins with a literature review of the topic. The cross-disciplinary nature of land preservation scatters relevant information across the fields of hydrology, biology, planning, landscape architecture, economics, agriculture, forestry, real estate, and political science among others. By collecting pertinent work and studying the methodologies and conclusions that have been formed by scholars, academics seek to become experts on the topic. Having a working knowledge of what has already been published allows the writer to build on previous research or address issues that have not yet been considered. Within the field of land use planning, the goal is to develop new perspectives, methodologies, and conclusions demonstrating how land preservation can be a positive tool for local communities. Once the paper is completed, it undergoes a detailed peer review process before it can be published. This rigorous third party assessment is a vital step to ensure that published research is original, relevant, and accurate. Through this process, editors of journals prevent the transmission of documents that have the potential to misinform and are able to maintain prestigious levels of research for circulation.

Once research has been prepared, reviewed, and published, academics encounter a variety of challenges in the pursuits of policy change. The first problem is readership. Detailed research, which can take years to develop, is often published in journals that require membership fees.



Being published in a respected journal gives validation to research, however these documents are often only accessible in academic settings, such as university libraries that are rarely open to the general public. Furthermore, even though the majority of the population can understand the discussion of results and conclusions, many of the introductory terminologies and methodologies are complex and require higher levels of education. Many readers will never make it to the end of the paper where the recommendations are located and instead choose to ignore the work. In such cases, the intended objective of the paper is never achieved. How can research affect policy changes if the work remains solely in the discourse of the few?

The challenge of affecting policy is compounded when published materials do not inform policy makers. Without reliable research as a guide, local land use decisions are often based on the opinions of the most outspoken constituents. These voices often speak forcefully for economic growth and are willing to sacrifice the environment to achieve greater short-term financial profits. It is difficult for regular citizens to recognize links between new development, storm water management needs, reduced air quality, decreases in species diversity, and lost opportunities for recreation. It is the responsibility of the academic to be persistent, attend and speak at public meetings, sit on boards for government and NGOs, and educate through collaboration and hands-on opportunities. It is only if this message is heard and understood that the population and elected officials will inform their decisions with appropriate research.

The lack of a long-term perspective in the community is another major challenge the academic faces. Long-term policy recommendations often are ignored when the boards are filled with politicians, lawyers, and businesspersons seeking to implement short-term goals. These immediate goals frequently have long-term costs, which are not calculated in the original financial estimates. Many of them will be borne by the residents through future tax increases or infrastructure investments. These costs include increased spending for police and fire protection, traffic control, sewage treatment, and water supply, and could in time lead to abandoned properties and loss of property tax. Studies have demonstrated that seeking ratables does not reduce the costs of running local government (ANJEC 1997). In addition, since most of the projects are awarded to private corporations, there is the risk of cronyism and corruption within the development process. We can avoid this type of dishonesty by developing public/private partnerships and open participation.

Academic research about land preservation frequently seeks to analyze change across social, environmental, and economic perspectives. The goal of such research is to ensure long-term sustainability for the benefit of future generations. However, land preservation frequently occurs in a very reactive manner. Once a property goes on the market there is competition between business and preservation groups. This can include litigation leading to an inflated cost of the conservation easement or property if purchased outright. Furthermore, since properties are protected as they go for sale, it tends to create small islands of protected land that do not maximize benefits for the community or the ecosystem. Rather, large blocks or corridors are necessary for species to thrive. Even linking open space with cluster developments is better as long as there are corridors (Arendt 2004). By planning proactively, non-governmental organizations (NGOs) and local communities can prioritize properties, pool funding, not overpay for land, develop networks of preservation, and have greater reliability in their investments (Daniels 2000).

There is quantifiable evidence that land preservation at the local level has a positive impact on property values, aids in environmental controls such as flooding, improves air quality, and creates opportunities for recreational pursuits (Elkis 2011). Despite this information, communities may choose not to protect open space because they believe it will hurt the overall tax base of the towns. This hunt for ratables leads to sprawl, further contributing to a

dependence on automobiles, increased use of foreign fuel, air pollution from carbon emissions, public service costs for new roads, sewers, schools, and water pollution from the paving of impervious surfaces (Daniels 2014). By conducting research, publishing the work, and having it available to the communities, local governments can become well informed and make decisions that have long-term sustainable impact.

The hope is that studies about sustainable land preservation practices will reach the board of commissioners, the planning commission, the open space committee, the environmental advisory boards, and local land trusts. These groups can then implement considered, deliberated, and peer-reviewed research. Data obtained from such research can act as a counterbalance to the political impulses, economic pressure, and social myths that so often drive local development and devalues open space protection.

The academic strives to create and present balanced, educated, and well researched work. Presenting the information to the public in a digestible format is essential for sustainable protection of natural and working landscapes. Although challenges seem paramount, academics must persevere and find new ways to further develop their research. Their efforts are an integral component in the field of land conservation.

### *The Mind of an Executive Director*

Another aspect of the paradigm shift from government run land conservation to private land protection was the appearance of land trusts. Generally, these nonprofit organizations create private preserves that can be similar to public parks. The head of a land trust is called an executive director. The goal of an executive director is to protect, manage, and expand upon the trust's land holdings; however, the reality is that he or she must be a financier, a planner, a computer tech familiar with GIS, a manager, and an event planner, all while maintaining existing properties and easements, finding new ones, and making sure the non-profit meets the financial bottom line.

The executive director must first choose between buying the land, purchasing development rights, or acquiring development rights by donation. Preserving land through fee-simple acquisition requires a great deal of capital upfront and a reliable source of future income for ongoing property expenses. Alternately, by obtaining only development rights and allowing ownership to remain with another party, executive directors can ensure that their limited budgets will have funds available for future endeavors and maintenance. These maintenance costs include implementing a land management plan, paying real estate taxes, making payroll, and performing outreach to the community. Executive directors constantly seek creative techniques to obtain land and development rights on properties to balance the budgets of their local and sometimes cash-poor land trusts. These NGOs have become essential in the field of land preservation as the federal and state governments are unable to keep up with the financial demands of land preservation. Because of the lack of funding available, the easement has become the smart choice for land protection.

Combating the development pressure from World War II to the early 1970s, executive directors struggled to permanently protect open space. Since outright land ownership was not always feasible, they sought a new mechanism that would require less capital and lead to the protection of larger parcels or to a greater diversity of land ownership holdings. Building on the traditional legal doctrine of easements, policymakers developed a new tool known as the conservation easement that would run with the land and thereby assure protection of the land beyond the lifetime of the current property owner (Owley-Lippmann 2006).

By purchasing or having development rights donated, a conservation easement gives

“a non-possessory interest of a holder in real property imposing limitations or affirmative obligations the purposes of which include retaining or protecting natural, scenic, or open-space values in real property, assuring its availability for agriculture, forest, recreational or open-space use, protecting natural resources, maintain or enhancing air or water quality or preserving the historical, architectural, archaeological, or cultural aspects of real property” (National Conference of Commissioners on Uniform State Laws, 1981) .

Executive directors were at first concerned with the legitimacy of the easement in practice since there is no federal law governing their creation. Rather, each state has its own conservation easement law. However, there is a federal tax law (Internal Revenue Code 170) that allows for a charitable deduction from income taxes when a conservation easement is donated or sold for less than its fair market value to the government or a charitable organization with the resources to enforce the easement (Paul 2007). Finding donors has become one of the major goals and challenges of an executive director who must reach out to the local communities for funding or land donations in hopes of robust preservation endeavors.

Conservation easements are considered charitable gifts when they are perpetual and are donated for “conservation purposes.” The Internal Revenue Code defines conservation purposes as:

“The preservation of land areas for outdoor recreation by or for the education of the general public. The protection of relatively natural habitats of fish, wildlife, or plants, or similar ecosystems. The preservation of open space – including farmland and forest land – for scenic enjoyment or pursuant to an adopted governmental conservation policy. The preservation of historically important land or buildings” (IRS 1954).

The charitable federal income tax deduction is often the critical part of a landowner’s decision to make a conservation easement donation. Yet, in addition to the land donation, executive directors also aggressively seek financial donations from every possible source. The IRS codes for charitable gifts have become the key tool for accomplishing the most important goal of the land trust’s executive director: financial stability.

Executive directors at land trusts that choose to hold conservation easements face many challenges. Despite the substantial tax benefits, landowners do not aggressively seek out land trusts to donate easements. Typically, an executive director at a local land trust will develop a list of target properties in the community. These are currently undeveloped parcels with legitimate conservation qualifying features. The executive director will determine who owns these properties and work to foster a relationship with the titleholder through a strategic outreach program. These cultivations can take many years and require considerable resources, but are essential components of the outreach and collaboration.

The executive director must constantly monitor the target properties and be prepared to act when an opportunity arises. Even if the timing is perfect, complicated situations often arise, involving discord between family members or neighbors who are hesitant to relinquish their property rights and may very well initiate a public and political campaign against the NGO.

Individuals may also donate property through their last will and testament. In these circumstances, property owners want to ensure their land remains in a natural character or undeveloped. If the parcel were not protected, the surviving heirs would be burdened with a very high estate (or death) tax, possibly resulting in the sale of the property, since the estate tax is levied on fair market value rather than current use (Small 2002). By creating a conservation

easement that restricts future development rights, the fair market value of the property and the estate taxes are reduced accordingly. This makes the conservation easement an attractive proposition for heirs that want to keep their family property undeveloped, but lack the means to do so.

Even after any issues with neighbors and family are resolved, the executive director must spend time and money to be able to accept a donation. First, to be considered “qualified,” the land trust must act as a nonprofit charity (IRS 2010). Before accepting a conservation easement, the land trust needs to create a variety of reports and documentation describing the present state of the property including a summary of the physical, biological, and geological resources on site. They must also develop a deed report ensuring there are no liens on the property’s title. These reports are necessary since the Internal Revenue Service (IRS) can audit to verify the conservation purposes justify the tax deductions.

Constant budgeting is a major challenge associated with leading a not-for-profit organization and the revenue sources of many land trusts are limited by their 501(c) (3) status. If a variety of financial issues arise simultaneously, even if some are positive opportunities to protect land, it can become very difficult for the executive directors to cover overhead expenses including payroll and benefits for employees. In order to remain financially solvent, the executive director must raise funds from the public. One way to do this is to host events. Events include donor appreciation parties, workshops, nature walks, and environmental education programs, all of which offer opportunities to discuss issues and organizational needs with potential donors. By familiarizing members of the community with the organization they may be persuaded to contribute to the land trust in the future. Forming these types of public/private partnerships is a critical part of the executive director’s role.

While land preservation seeks to protect ecosystems, the executive director must spend his/her days focused mostly on fiscal stability and administrative concerns. Without a director to manage donations, land acquisition, and to ensure continued financial support, land trusts would be unable to accomplish their intended purposes. Without the efforts of executive directors, the modern land preservation paradigm would not function.

### *Restoring With a Land Steward*

The efforts required to protect land cannot end with a contractual preservation agreement; rather it is there the job of a land steward begins. After the land is purchased or an easement is held, land stewards are charged with monitoring, protecting, and restoring the native ecosystems on properties preserved by a land trust. These actions are governed by the two main tenets of restoration ecology. First, there is an assumption that the current ecosystem has been significantly degraded by human actions. Secondly, biodiversity is accepted as the goal of restoration projects and seen as a measure of ecosystem health.

Evidence supporting the degradation of North American ecosystems can be found by comparing the current biodiversity and species population numbers with figures from before European settlers arrived on the continent, or even with those of just 50 years ago (Sauer, Hines, and Fallon 2008). Overall, population numbers are down, species diversity is reduced, and in some cases there has been extirpation (e.g., American chestnuts and Passenger Pigeons).

A major cause of biodiversity decline is the deforestation and subsequent development that has occurred over the last 200 years. Since the arrival of Europeans, the eastern half of the continent has gone from being virtually covered by forest to almost complete deforestation (Van der Pluijm 2014). While much of this area has since been reforested, the majority of these

woodlands consist of secondary or tertiary growth. Among the negative effects of this massive disturbance is that modern forests now include many species introduced from other continents by humans (mainly Asian and European species because of similarities in climate). These alien species often out-compete native species, which inhibits ecosystem succession and reduces biodiversity.

Lower biodiversity is undesirable for a number of reasons. Less diverse ecosystems are more vulnerable to hardships like drought or disease. Conversely, healthy and diverse ecosystems are resilient, adaptable, and likely to persist through natural fluctuations. Healthy ecosystems also provide important services such as erosion control, water and air purification, habitat for threatened and endangered species, and the preservation of natural beauty (Isbell et al. 2011).

The combination of decreasing biodiversity and increasing pressure from alien species defines the challenges of the modern land steward. Whether in woodlands, grasslands or wetlands, the goal is to remove unwanted invasive species and foster the reestablishment of native habitats that support a high diversity of life. Many non-native species are labeled “invasive” because of their tendency to conquer ecological niches that were previously occupied by one or more indigenous species. Such losses of vegetative diversity have a negative impact on other populations throughout the ecosystem. The survival of many insect populations is dependent on the presence of specific species of plants. These insects have developed specialized digestive systems that only allow them to feed on the plants that they co-evolved with. For example, the larval stage of a Monarch Butterfly will only feed on the leaves from the genus *Asclepias*, commonly called Milkweed. Without their host plant, insect specialists cannot survive. This affects the entire food chain: reptiles, amphibians, fish, mammals, and birds all rely heavily on insects as a food source. Since ninety-seven percent of bird species feed insects to their young, there is less food for young birds, thus resulting in lower avian survival rates and reduced biodiversity (Latham 2007; Tallamy 2009).

To combat decreasing biodiversity, the land steward must protect, restore, and create the habitat for plant and animal communities that are quickly disappearing from the modern American landscape. While sprawling developments and agriculture continue to usurp huge chunks of open space, the land steward must work within the bounds of land that has been preserved to support imperiled species. He or she can start with grasslands, a biome notably absent in the eastern United States that gives great opportunity for restoration (Latham 2007). Grasslands support a high diversity of life, providing a home for native grasses, forbs, insects, birds, and mammals, many of which cannot survive without this type of habitat (grassland-obligate species).

Grasslands were traditionally an ephemeral type of habitat, created when fire or some other natural disturbance removed the vegetation from an area. Such an event would initiate the process of succession, which describes the transition over many years from a newly disturbed area back into a climax forest. The first plants to repopulate an area are grasses. Years or decades later, low shrubs and small trees begin to dominate, until they ultimately give way to large canopy tree species. In each phase of this sequence, habitat is created for a specific community of species (Gill et al. 2006).

However, humans have degraded the current ecosystem significantly and succession is often inhibited by a number of factors. Contiguous natural areas have been vastly reduced in size, divided by roads and development. These barriers prevent disturbances, such as fire from occurring on a large scale. In addition, invasive plant species prevent native plants from repopulating disturbed sites. Furthermore, in some areas, overpopulated white-tailed deer are

responsible for the destruction of vast numbers of sapling trees and forbs, further retarding the natural succession towards woodlands (Latham et al. 2005).

Land stewards must act to promote habitat that is no longer being developed through natural processes. This will involve significant resources, but will be extremely valuable for species. Here, one of the major contradictions to environmental restoration arises. Pulling invasive species by hand or intense mowing are ineffective means of controlling the spread of these aggressive plants, especially in a large area of disturbance like a meadow. While the goal is to create a healthy and native grassland ecosystem, the only viable first step is often to eliminate all existing vegetation using a large scale boom sprayer to broadcast herbicides across the entire space. This will reduce the competition and give native vegetation that will be planted an opportunity to grow; however, the chemicals needed for this are noxious. Ironically, poison is one of the primary tools available to a land steward to achieve the goal of ecosystem restoration and health.

Also, once established, grassland must be continuously disturbed to prevent succession; yearly mowing, or prescribed burning are common practices. Both methods prevent “woody” vegetation (like trees and shrubs) from becoming established. Yet, depending on the location of the preserve, prescribed burning (which offers ecological benefits that mowing does not) can be very difficult to coordinate. Local, state, and federal agencies must be notified, the appropriate permits must be obtained, and trained professionals must be on site. At this point, local residents might still object. If they do not appreciate the value of ecosystem restoration, they will likely be more concerned about possible impacts to their neighboring property and the bucolic viewscape to which they have grown accustomed. It is important that the land steward uses this as an opportunity for education, partnership, and hands-on opportunity for local citizens. Open dialog with visitors and neighbors and participation on local community boards can help to ease fears and explain the benefits offered by allowing a natural process like burning to occur.

The combination of yearly disturbance (e.g., mowing or burning) and a commitment to the continued control of unwanted non-native species that occur in the field promotes optimal conditions. As the target plant communities become established, the hope is that other pieces of the native ecosystem will take advantage of the habitat created (Harper 2007). The presence of native, grassland-obligate species is the ultimate measure of success for grassland restoration projects.

Using a variety of techniques, the land steward acts to restore critical pieces of the native ecosystem. Through such efforts, preserved land takes on greater ecological value, provides increased ecological services, and optimizes land protection ideals. Additionally, there are a variety of opportunities to collaborate with scientists and the public, and to foster educational partnerships that stress the importance of land protection and ecological restoration.

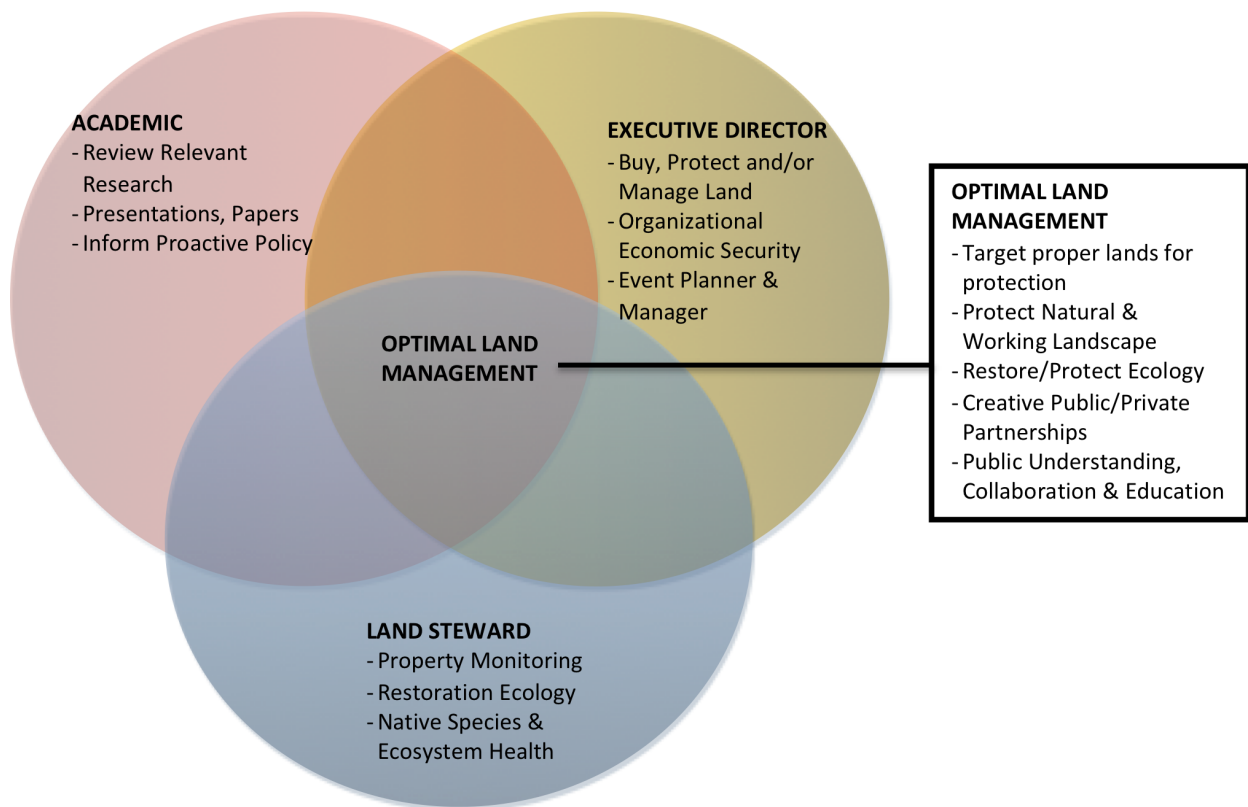
## **Conclusion**

Modern land preservation relies on contributions from a variety of disciplines and specialized methodologies to achieve optimal land management. The preservation versus conservation debate that Muir and Pinchot started over one hundred years ago is no longer the debate of today. As funding for large fee-simple land purchases dissipates at the federal and state levels, many publicly funded nongovernment land trusts have emerged to preserve open space and the working landscape. These individual organizations leverage funds to preserve land through a combination of donations, outright purchases, and the facilitation of conservation easements on

lands that remain privately owned. In addition, modern land trusts often take an active role in managing degraded landscapes to restore biodiversity and optimize ecological services. It is the hope that peer reviewed research from scientists and academics is informing these decisions as opposed to retroactive planning. This is the new paradigm of land preservation and conservation: instead of creating large national parks as untouchable museums of ecology, modern land protection channels public funding, creative partnerships, and an emerging understanding of the working landscape and complex ecological processes. This new system for preserving land is driven by the integration of many different perspectives and disciplines that contribute separately to the collaborative effort.

The future success of land protection rests largely with individuals in these disciplines. Despite the collective nature of this pursuit, these professionals rarely come together to discuss their techniques and perspectives. In this paper, the objectives and challenges faced by members of three distinct fields have been narrated with the intention of opening a dialog between some of the disparate elements of the modern paradigm. It is important that future research brings to the forefront the other discourses (i.e., government agencies, financiers, educators, scientists, GIS techs, etc.) that have arisen within the current scope of land protection.

**Figure 2: Overlapping Land Preservation Practices and Priorities**



To achieve the collective goal of optimal land management each of these professions must play a unique roll. Without academics, impartial research, and opportunities to influence preservation policies would be lost. Without executive directors, parcels would fail to be protected and land trusts would become insolvent. Finally, without land stewards many protected lands would fail to provide valuable habitat or ecological services. However, there are greater opportunities for growth within the field if these groups are able to work more closely together. Academics can sit on land trust boards, executive directors can come to the classroom and partner with universities for policy research, and everyone should have the hands-on experience and awareness that comes from stewarding actual ecosystems outside of the office or classroom.

Although many of the problems that have been discussed here are unique to specific aspects of land preservation, the challenge of working with local citizens is a common theme in all of these professions. Outreach, education, and persistence are required to overcome the antithetical views of those who do not yet fully appreciate the intricacies and benefits of protecting land both regionally and in their own communities. For the new paradigm to succeed, public awareness about the need for ongoing land protection is of paramount importance. By bringing these discourses together, a singular voice will emerge to articulate the need for perpetual conservation of our nation's lands.



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