REACHING A MILLION: LAND CONSERVATION PATTERNS AND PROCESS IN NORTH CAROLINA, 1999-2009

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ABSTRACT

Emily Page Bidgood: REACHING A MILLION: LAND CONSERVATION PATTERNS AND PROCESS IN NORTH CAROLINA, 1999-2009
(Under the direction of Alan Weakley)

My research examines how land conservation efforts are carried out by institutions and informed by public policy using as a case study North Carolina's legislative commitment to conserve one million acres of open space from 1999 to 2009. I use a geographic information system (GIS) to analyze the spatial patterns of land conservation in relation to environmental and socioeconomic metrics, and compare land conservation efforts before and after 1999. Based on qualitative interview work with 39 professionals active in the conservation field, I discuss the role of the state's legislative commitment and describe how the institutions and resources of the conservation field have changed over time. I argue that further effective efforts to conserve beyond "one million" acres will require new messages and commitments from the state.

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LIST OF ABBREVIATIONS

ADFP	Agricultural Development and Farmland Preservation Trust Fund
CPT	Conservation Planning Tool
CWMTF	Clean Water Management Trust Fund
GAP	Gap Assessment Project
LTA	Land Trust Alliance
MAI	The Million Acre Initiative
NC NHP	North Carolina Natural Heritage Program
NC DENR	North Carolina Department of Environment and Natural Resources
NC DPR	North Carolina Division of Park and Recreation
NC PCP	North Carolina Plant Conservation Program (within the NC Dept. of Agriculture and Consumer Services)
NHTF	Natural Heritage Trust Fund
NLCD	National Land Classification Data
PARTF	Parks and Recreation Trust Fund
NC WRC	North Carolina Wildlife Resources Commission

CHAPTER 1. Introduction

1.1 Introduction

The turn of the 21st century signaled a shift in the North Carolina state government's approach to land conservation, beginning with the establishment of a Million Acre Initiative, a legislative commitment to "encourage, facilitate, plan, coordinate, and support" the conservation of one million acres of "farmland, open space, and conservation land" before 2010 (Chapter 113A section 241). Although the legislation does not also designate specified funding for the protection of a million acres, the rate of conservation has increased dramatically and more private and public dollars have been spent on land conservation in the subsequent decade (LTA 2005).

This thesis explores patterns of land conservation from 1999 to 2009 in North Carolina, using a mixed-methods approach that combines geospatial analysis and qualitative interviews with conservation professionals, to retrospectively evaluate the role of institutions and public policy in shaping conservation patterns. I describe the outcomes after a decade of accumulated effects of state policy as it relates to conservation patterns, e.g. where are conservation efforts concentrated in the state; and how the government's shift has led to these outcomes. Given the current patterns, I conclude with recommendations for the efficacy of future land conservation in North Carolina.

This project is specific to place and time, but also addresses broader concerns with how conservation is carried out in a specific locale while also shaped by more abstract political, economic, and social forces. In this introductory chapter I take a larger conceptual view, examining how land is conserved in the face of threats to the environment. I give an overview of the institutions that conserve land in the United States. This is followed by a brief outline of how land is conserved from a strategic theory perspective and the set of conventional legal instruments used to carry out conservation. Given these general patterns, I argue that North Carolina is an exemplary case study for examining conservation in an integrated fashion and the Million Acre Initiative is an opportunity to examine the effects of state policy on conservation patterns and process.

What is Open Space?

North Carolina's Million Acre Initiative promotes the conservation of "open space", which is shown by Appler (2004) to have a variety of definitions and applications in gray literature. *Open space* has been defined by the services it provides, such as drinking water protection or flood mitigation; it can be defined by the character of the area, such as the size and ecosystem quality; it can be defined by the restriction of uses on the land, such as no urban development; or it can be defined by an existing protected status, like parkland or historic register properties. The commonality, however, between these definitions is that open space is a designation bestowed by a governing authority that *recommends* a restriction on development or degradation.

Conservation land is defined by the presence of such restriction: the presence of a legal contract that limits development in order to conserve an area's value, or where

development is deemed opposite to the owner's conservation value objectives (Cronan 2010). Since conservation value is in the eye of the beholder, conservation lands can have a spectrum of management, extractive, and public accessibility scenarios, depending on the objectives of the institutions involved, the values being conserved. In other words, not all open space is conservation land, but all conservation land could perhaps be deemed open space. This recognizes that land is conserved by a variety of different institutions for a variety of different reasons, or according to a "constellation of values" (Miles 2009, p. 17).

The fluidity of this definition of conservation land, and its embrace of both a utilitarian and an intrinsic relationship with nature (Callicott 1990), is not out of bounds with other lexicon. The International Union for Conservation of Nature (IUCN) defines a Protected Area (PA), as a place "especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means" (DeFries et al. 2007). Therefore PA's are defined as being principally designed for "protecting" and "maintaining" biodiversity, and other associated values can be part of the management scenario. However, in practice, conservation lands are not always established with such a hierarchy of value (Pressey 1994).

1.2 Why Conserve Land

> Protected areas are a cultural response to perceived threats to nature. Because society is constantly changing, so too are social perspectives on protected areas and the values that they are established to conserve.
>
> McNeely qtd. in Chape 2005

Vitousek et al. (1997) categorize and quantify how humans are dominating the global environment. Freshwater systems have been altered for human uses, and biogeochemical

cycles, particularly those of CO_2 and Nitrogen, have dramatically changed. Land transformation and conversion has been intensified by population growth and more people inhabiting space or demanding more from it; land conversion has also spread horizontally from changing land use patterns, particularly low density growth that fragments open space with residential use, roads, and other infrastructure. This "growing scale of human enterprise" has lead to terrestrial and marine biotic extinctions and a homogenization of the earth's biota (p. 498). These alterations could similarly be viewed as threats to nature, in the face of which, according to McNeely quoted above, protected lands are established.

Vitousek et al. write that more human involvement will be necessary in order to "maintain the diversity of the 'wild'," and preserve or restore the resources we still have (1997, p. 499). However, the nature of needed involvement, as McNeely suggests, will be affected by the cultural perspectives on the values and goals of protected lands, which ultimately originate from an ever-changing understanding of nature (Callicott 1990) and the threats facing nature. According to Redford et al. (2003), the resources and lands targeted by conservation groups that seek to protect nature against threats have a "complicated history", and targets have "evolved along with the principal values assigned to conservation, namely, intrinsic value and utilitarian value. Today's conservation institutions justify land conservation according to various categories of perceived threats to nature, human health and sustainable livelihood, including the loss of biodiversity, the loss access to open space, the degradation ecosystem services, and the disappearance of farmland.

Biodiversity loss

Biodiversity broadly represents "multiple levels of biological organization," and has been symbolized as a hierarchy of genes, species-populations, ecosystem-communities, and regional landscapes (Noss 1990). Each of these biological levels can be understood in terms of its composition (the variety of parts it consists of), structure (the organization of how these parts relate), and function (the processes that maintain composition and structure).

One critical facet of the contemporary biodiversity crisis is hailed as the sixth major extinction: species extinction is occurring at rates from 100 to 1000 times higher than those before human presence dominated the globe (Wilcove et al. 1998). As species disappear, other facets of biodiversity are affected: genes are lost, populations dwindle, and communities are depleted. The structural and functional components of biodiversity are being altered as well. When species are lost, or when species population sizes are restricted, overall genetic diversity is reduced. Alteration of habitat through fragmentation, pollution, and even the disruption of disturbance (such as fire or flooding) that is important to species life histories and maintaining community processes, compromises the structure and function at multiple levels of the biological hierarchy (Primack 2002). Furthermore, the homogenization of biota across the world through the introduction of invasive exotics has overall diminished landscape-level diversity (Vitousek et al. 1997). Land and habitat loss is cited as a main contributor to decline of biodiversity (Wilcove et al. 1998). In the face of human-driven global change, land protection, as *in situ* conservation, has become the cornerstone of preserving biodiversity (Soule 1991).

Losing connection to nature

Changing land-use patterns have lead to a loss of access to open space, either through land becoming fragmented, privatized, or converted to other uses. Open space has become less accessed, as well, through the conversion of cultural lifestyles to more urban, more indoors, or in other ways more disconnected from the environment. Featured in Louv's (2005) call-to-arms work, Last Child in the Woods, Louv argues that children are spending less and less time outdoors, suffering physically and spiritually, and apathy towards the environment is on the rise.

At the same time, existing areas for recreation are insufficient in size and extent if they are expected to continue to serve a growing population. Metropolitan areas in particular, according to the Trust for Public Land, do not have sufficient recreational spaces; major cities like Los Angeles, Atlanta, and Dallas have fewer than 10 acres of open space per 1000 residents (Sherer 2006). Existing park areas need further protection. Research on national parks and other areas protected for the persistence of biodiversity have shown that parks are not insulated from their surroundings: spread of invasive species, loss of large mammals, interference with disturbance, and increases in adjacent residential development, are among the forces that can negatively affect conservation of resources within parks (Hansen and DeFries 2007). Parks are essential to community economic development, according to reports from the National Recreation and Parks Association (2005) and American Planning Association (2002) and land that is available for recreation is seeing record visitor numbers. For example, the North Carolina Division of Parks and Recreation reported an increase in visitation of 13% from 2008 to 2009 (and an increase in 238% over the past 25 years) (NCDPR 2010). A 1996 national public opinion poll revealed an overwhelming majority

supported further establishment of national parks and stronger policies to protect open space (70.7% agreed and 77.7% agreed, respectively) (Gustanski and Squires 2000). Thus, more public spaces for recreation are needed to support the needs and desires of citizens.

Decline of ecosystem services

Ecosystem services represent a different framing of threats to nature. Ecosystem services are the suite of benefits that nature provides human communities, such as air and water filtration, mitigating climate change, pollination, soil nutrition, fisheries and timber support, and energy extraction potential (solar, wind, biofuels) (ESA 2000). Sensitive areas such as coastal ecosystems (reefs, mangroves, barrier islands), wetlands, and floodplains, provide service as barriers during natural disasters. Recreation and the pleasure we derive from experiencing nature are also ecosystem services. The Millennium Ecosystem Assessment illustrated in definitive detail how destruction of ecosystems is affecting human communities around the globe, particularly those that are most poor and vulnerable (MEA 2005). An ecosystem services view holds that protecting nature from degradation sustains, or even strengthens, human health, economy, and quality of life.

As a conservation target, ecosystem services were heralded as the best approach for conservation groups to accelerate public support for conservation, since ecosystem services are "mainstream – attractive and commonplace" (Daily et al. 2009). According to Salzman (2005) an ecosystems approach to environmental protection begins with understanding that, "the environment offers critically important services for free that, if we had to pay for substitutes in markets, would command extremely high prices…The first insight of an ecosystem services perspective is that investing in natural capital can prove more efficient

than using built capital to deliver key services" (p. 877). Investing in natural capital—in the services that ecosystems provide—necessitates a diversity of policy strategies, including regulation. Conserving open space land is one part of this larger strategy.

Loss of farmland

Bunce argues that farmland is conserved for a "multiplicity of values" that have been defended, constructed, and changed over time. He writes that since the 1960's environmental movement farmland conservation has become "part of the overall conservation package, fulfilling the role of guardian of open space, nature, scenery and rural character, and by extension, of bulwark against urban development"; simultaneously farmers have been cast as "stewards of both land and community" (p. 234-242). Supporters of farmland conservation argue that the loss of arable land threatens future food security, and protecting current agricultural systems maintains local and regional economy (USDA 2007). Communities value the aesthetics of farmland, the lifestyle and property values that are "inextricably bound" up with a farming landscape, and the symbol of cultural heritage that farmland can represent (Bunce 1998, p. 240). Supporters also argue that although the environmental effects of agricultural areas very much depend on the farm practices and location, compared to residential and urban development, cropland stores carbon dioxide, allows groundwater recharge, and provides habitat and food for wildlife (AFT 2009). For these many reasons, farmland conservation has become an integral part of land conservation efforts.

1.3 Who Conserves Land

Given the diversity of threats against nature, a diversity of institutions employ conservation strategies and legal instruments used to mitigate threat, including agencies of the federal government, state governments, cities and counties, and nonprofit organizations, such as land trusts. The federal government has historically been the dominant power undertaking land acquisition for the public good. The White House conservationist era blossomed under President Theodore Roosevelt, who between 1901-1909 established the nation's first 51 wildlife refuges, 18 national monuments, and established 5 additional national parks onto what President Ulysses Grant began towards the end of the 19th century (Cutright 1985). The Forest Service, National Park Service, and the predecessors to the Fish and Wildlife Service were established during this era. The legacy of the progressivist "gospel of efficiency" (Hays 1999) and the evolution of the federal agencies that manage public lands (some of the active players today are the Department of Agriculture's National Forest Service and Natural Resources Conservation Service; the Department of the Interior's National Park Service, Fish and Wildlife Service, and Bureau of Land Management) is treated by Knight and Bates' "A New Century of Natural Resources Management" (1995), and Hardt's "Federal Land Management in the Twenty-First Century: From Wise Use to Stewardship" (1994).

According to Bendick (1993), through the 19th and into the 20th century state governments acquired conservation lands along side the federal government, but at a slower pace. World War II transformed the American landscape, increasing population, urban and suburban development, and a demand for more public land. Starting in 1965 the federal Land and Water Conservation Fund substantially supported the growth of state parks and

forests, but in the 1980s era of political conservatism, federal funding vaporized. Bendick emphasizes that a citizen-lead environmental movement pushed states to find new ways to continue land conservation. The issuing of bonds, special appropriations, dedication tax funding sources, and regulatory legislation regarding wetlands and air quality, are just some of the tools employed by states to protect land. In addition, partnering with the nonprofit-private land trust community, which had creative financing methods and was not encumbered by bureaucracy, became essential for states.

Land trusts numbers grew exponentially in the later 20th century as part of the grassroots response to the conservative era of federal funding cuts (Brewer 2003). However, the history of private conservation organizations goes back for more than 150 years. The Mount Vernon Ladies' Association purchased, and continues to own and manage to this day, George Washington's birthplace and estate in 1853, thereby founding the first organization devoted to historical land preservation (Fairfax et al. 2005; Mount Vernon Ladies' Association 2010). Considered the first land trust, The Trustees of Reservations was founded in 1891 to "acquire and hold, for the benefit of the public, beautiful and historical places in Massachusetts" (Brewer 2003, p. 17). Today the Land Trust Alliance tracks 1,700 organizations that acquire and advocate land protection in the United States and LTA quotes that these organizations have had a direct hand in conserving 37 million acres (LTA 2005).

Because the role of the federal government shifted so dramatically in the 1980s, the proposed argument has been that over time conservation efforts have shifted from the public sector to the private, or nonprofit, sector (Raymond and Fairfax 2002). However, Raymond and Fairfax have reconsidered the "shift to privatization" theory, arguing that conservation efforts are complicated co-dependent relationships between public and private sectors. Public

ownership of land has come to "embody a surprisingly diverse set of title arrangements and management strategies" (p. 607) involving private interests. Public funding is a dominant force in how the diverse suite of nonprofit-private conservation organizations carries out their work.

1.4 How to Conserve Land

Strategic frameworks

Land conservation institutions are faced with limited resources and a sense of crisis in the face of relentless threats. According to Soule (1985), "in crisis disciplines, one must act before knowing all the facts…tolerating uncertainty is often necessary." Therefore, conservation scientists have generated strategic planning frameworks to optimize conservation practice. These frameworks have been traditionally focused on the planning of reserve areas and networks to ensure long-term viability of the full spectrum of biodiversity (also called "resilience and representativeness") (Margules and Pressey 2000). Knight et al. (2006) delineate strategic conservation planning and systematic conservation assessment; assessment is inventory of the targeted resources to be conserved and prioritization; planning involves integrating a strategy for implementation of the conservation of those priorities.

Strategic assessment and planning has begun to extend to other realms, such as farmland selection (e.g. Tulloch et al. 2003 present a parcel-level selection tool used in New Jersey; Machado et al. 2003 posit a model for site prioritization in California). According to Egoh et al. (2007), there is currently no accepted method for conservation planning for ecosystem services. Daily et al. write that neither "the scientific basis, nor the policy and finance mechanisms for incorporating natural capital [ecosystem services] into resource- and

land-use decisions on a large scale" have developed easily or rapidly. There is, however, a growing body on incorporating components of ecosystem services into planning (e.g. Chan et al. 2006).

Legal instruments

Institutions that seek to conserve land only work with willing landowners who voluntarily want to undertake conservation action on their property. Institutions in their media and outreach stress the voluntary nature of conservation, perhaps due to the misunderstanding that conservation is coercive act of taking by the government. For example, a 1999 survey of public support for conservation in North Carolina found that 55% believed that a state initiative to conserve more land would violate private property rights, showing the majority of those polled misunderstood the process of voluntary land protection. Today's land conservation is far from coercive; it is usually a win-win situation for all parties involved.

There are two main legal avenues to conserve land. Fee simple conservation refers to a conservation institution, usually a public office or nonprofit organization, acquiring a property outright. The institution may purchase the property from a landowner at equal to- or lesser-than market value, or may accept the property as a donation or a bequest. Landowners that gift their property to a nonprofit or public institution are entitled to federal tax relief; the ever-changing world of state and federal conservation tax law is treated in Clark's "A Field Guide to Conservation Financing" (2007), and Levitt and Bergen's "From Walden to Wall Street" (2005).

The second legal tool used is conservation easements. According to Gustanski and Squires (2000), conservation easements have become the "single most important tool" in land

conservation (p. 9). A conservation easement is drawn from "the legal partition of ownership", or understanding property rights as a bundle of sticks (p. 16). Development rights, or rights to uses that would usually degrade the resources that are important on the property, are donated or sold to a nonprofit land trust organization or to a public agency. The landowner retains the remaining rights to the property. In exchange, the landowner is allowed tax relief, depending on the appropriate tax codes, according to the devaluation of their property. Under federal tax codes, easements granted for perpetuity qualify for charitable tax breaks and exclusion from estate tax, however the variety of state tax situations and easement purposes are discussed at length in Gustanski and Squires (2000).

Easements have gained popularity because they are less expensive for a conservation institution to acquire, compared to purchasing a property fee simple. Estimates from Shaffer et al. (2002) regarding the cost of preserving a systematic reserve network system in the United States (which would consist of approximately 25% of the contiguous states) over a 30-year period, were $428 for acquiring the land fee simple and $257 for protecting through easements. Additionally, because landowners retain rights to the land, and there can potentially be flexibility in easement contracts, easements are often times more agreeable to individuals.

1.5 Land Conservation in North Carolina

North Carolina is witnessing many of the “threats” to nature presented earlier in this chapter. In 2000, NC was the sixth fastest growing state and the fifth fastest for attracting new residents from elsewhere, and it was estimated that 100,000 acres of open space were lost annually (Brookings Institute 2000). The state has a long history of agriculture, but is

ranked third for most prime agricultural land lost (USDA NRI 2007). Coastal change is also a factor for North Carolinians, as the extensive coastline of the state opens it to loss of land through rising sea levels due to climatic warming. In addition to these sensitive coastal areas, the state's other ecoregions make it uniquely diverse in its ecology. NatureServe's mapping of rarity and species richness in the United States calls attention to the fact that North Carolina's mountains and coast are two nationally important biodiversity hotspot regions (NatureServe 2010).

Approximately 11% of NC is managed for conservation purposes (4 million acres), which includes state and national forests, state and national parks, nature reserves and wildlife refuges, game lands, and land owned by private conservation organizations and municipal governments for conservation purposes. This means that conservation lands in NC have a spectrum of management, extractive, and public accessibility scenarios, depending on the values and objectives of the institutions. The federal government's land ownership is extensive, constituting 67% of land conserved; most federal land is comprised of national park and national forest service and is heavily concentrated in the western part of the state.

North Carolina has a plethora of private conservation organizations that advocate for land conservation and others that actively hold land for conservation purposes. There are national and international private organizations that conduct conservation projects, including the Trust for Public Land, the Conservation Fund, the Nature Conservancy, Audubon, Trout Unlimited, and the American Farmland Trust. As of 2010, every county has at least one of the state's 24 local or regional land trusts working in it (CTNC 2010). Six of these trusts are accredited with the Land Trust Alliance, whose southeast office is based out of Raleigh, NC. The Land Trust Alliance assesses that NC's land trusts have helped conserve 126,000 acres

since 2000, making them a leader among the land trusts of other southeastern states (LTA 2005). There are also advocacy organizations in NC, including Land for Tomorrow, a lobbying coalition of local governments, business, environmental groups, and conservation institutions, that advocates for state funding.

NC's state government is active in conservation. The Natural Heritage Program (NC NHP) inventories rare and threatened biodiversity and make recommendations for conservation. Wildlife Resources Commission (WRC) has a Diversity office devoted to non-game conservation and has been recognized for its development of its Wildlife Action Plan. The Division of Parks and Recreation (NC DPR) is known for its New Parks for a New Century plan. Four more state agencies purchase land for conservation, which may include some form of land stewardship: Coastal Reserves, Cultural Resources, Department of Agriculture (the Plant Conservation Program in particular), and the Forest Service.

The state has four public trust funds that fund various conservation projects. Clean water Management Trust Fund (CWMTF), funds water resources projects from private organizations, communities, and the state; the Natural Heritage Trust Fund (NHTF) funds biological inventory and acquisition of land of natural and cultural value by state agencies; Parks and Recreation Trust Fund (PARTF) funds public access projects from communities and the state; and Agricultural Development and Farmland Preservation Trust Fund (ADFP) purchases easements from individual landowners and funds community projects. Combined these trust funds have given over a one and a half billion dollars to conservation since 1987.

Starting in 1999, North Carolina Governor Hunt and the Department of Natural Resources officials began to reshape the state's approach to conservation in hopes their actions would focus efforts and increase the efficiency and effectiveness of conservation

funding. Governor Hunt led the General Assembly to pass a Million Acre Initiative, a legislative commitment to preserve an additional one million acres of conservation land over the next decade (from 1999 to 2010). As I argue in chapter two, the designers of the initiative conceived that more than a numerical target could be accomplished by this act. In the wake of the initiative, NC DENR formed One NC Naturally, a strategy from state agencies to pursue conservation efforts in a coordinated fashion, and began the design of the Conservation Planning Tool (CPT). The CPT would help identify which areas of the state were of high importance to be targeted by conservation efforts working towards the million-acre goal.

1.6 Thesis Structure

How has the role of the state in recent years affected what has become conserved in North Carolina, and to what degree has the Million Acre Initiative affected conservation? What is conserved in North Carolina, who conserves, and how has that land became conserved? Based on the conservation *status quo* what predictions can be made about the future efficacy of conservation in North Carolina? This thesis addresses these questions through two modes of research:

1. Analyzing protected lands data and environmental data with a Geographic Information System (GIS) to quantify what is conserved.

2. Conducting interviews with conservation professionals actively engaged in North Carolina land conservation to qualify what forces have lead to what has been conserved.

The thesis is organized into five chapters. The first chapter has contextualized the background of how, by whom, and why land is conserved and offered North Carolina as an interesting case study.

The second chapter examines the designing of the Million Acre Initiative. It uses public records (news media, internal emails and documents) and interviews to suggest the intent of the creators of the Initiative and the limits of the Initiative. It also briefly outlines how the Department of Natural Resources and private organizations reacted to the Initiative in the immediate following years. I present a discussion of the Initiative's effects in the final chapter where I synthesize these outcomes with geospatial results presented in chapter three and interview work presented in chapter four.

The third chapter is devoted to a geospatial analysis of environmental resources occurring in areas that have been protected since the Million Acre Initiative. Using a GIS (geographic information system) this analysis quantifies where these protected lands are located in relation to environmental resources and human communities, identifies areas of under-representation, and makes comparison with those protected before to suggest how conservation trends have shifted since 1999.

Drawing from interview work, the fourth chapter presents the perspectives and experiences of 39 North Carolina conservation professionals on institutional changes that have effected conservation in recent years and the balance of opportunity.

Discussion and conclusion make up the fifth and final chapter. Conservation professionals have differing views about the Million Acre Initiative, but I argue that the initiative will has relevance until the million mark is reached because it has created

opportunities for the public to leverage government. At the same time it has become a state initiative with its own institutional traditions that has restricted discourse about the Initiative to the state level. Such discourse is invoked for the most part only when local organizations engage with the state: it is not a primary source of leverage in their own communities.

In summarizing the input of land conservation professionals, I propose some ways that land conservation in North Carolina could be more integrated and effective. These questions and proposals serve not only as an analysis of the Million Acre Initiative, but a proposal for how to carry out land conservation in ways that address both local and global concerns.

CHAPTER 2. The Million Acre Initiative

2.1 Introduction

"Organizing principle." (4; 21)
"Strategic framework." (11)
"Positive opportunity." (7)
"Ambitious, inspiring." (21)
"A green light." (13)
"A great, great thing" (9)
"Unfunded mandate." (19)
"Placeholder." (24)
"One hit wonder." (28)
"A nice promise, but no." (14)

Fig. 2.1 Diverse ways in which conservation professionals interpret and respond to the Million Acre Initiative.

The quotes in Fig. 2.1 are selected to show a range of interpretations of, and sometimes negative reactions to, the Million Acre Initiative, legislature enacted in 2000 under Governor Hunt that codified the state's duty to "encourage, facilitate, plan, coordinate, and support" action towards a goal of one million acres of conservation land by 2010. Although not included in the list above, some respondents did not have a verdict on the

Initiative because, in the words of one person, “I don’t know much about it”. This chapter uses primary sources, media, and interviews, to fill the knowledge gap for those who find themselves in a similar camp.

The following material also provides some context for the initiative, including a discussion of the intent and goals that lead to its creation. I present this chapter not only to inform but also to provide a basis for evaluation of the initiative. How well does the program’s status in 2010 address the goals set out at the end of the 1990s? Although its name includes the publicized (and still unmet) benchmark figure of a million acres, in this chapter I show that this effort lead to many allied goals, including the development of integrated and collaborative strategies as well as concrete partnerships and programs to carry them out.

2.2 Governor Hunt's Challenge

The “Million Acres Open Space Goal” was approved by the North Carolina General Assembly in Spring 2000, and signed into state law by Governor Jim Hunt on June 28th at the Museum of Natural History in Raleigh. The Governor's Office press release quotes Gov. Hunt, “this commitment is not words, it is in our heart, and now that the Legislature has acted, it is in our laws”. The Million Acres Goal reads (Article 113A-241, my italics):

"The State of North Carolina *shall encourage, facilitate, plan, coordinate, and support appropriate federal, State, local, and private land protection efforts so that an additional one million acres of farmland, open space, and conservation lands in the State are permanently protected by December 31, 2009.* These lands shall be protected by acquisition in fee simple or by acquisition of perpetual conservation easements by public conservation organizations or by private entities that are organized to receive and administer lands for conservation purposes."

The Million Acre Initiative was potentially inspired by Hunt's personal experience

and current trends in the state and the nation at large. A Raleigh News and Observer article quotes a policy advisor: "The idea for a land protection initiative came to Hunt on a drive from Raleigh to his farm in Wilson…'He just started noticing farms disappearing for subdivisions and development and it concerned him'" (9 Nov. 1999). Two professionals knew different stories about how Gov. Hunt came to conceive of the initiative. The Secretary of DENR under Gov. Hunt said the idea was pitched to the governor at the opening of Gorges State Park, and one million acres in ten years was inspired by a recent study that had just shown that, by best estimates, the state was losing 100,000 acres of open space a year. One respondent I interviewed had heard that Hunt was influenced by the precedent of other states: "he'd had dinner at a National Governor's Conference, and he was seated next to then New Jersey Governor Christie Whitman who told him about their Million Acre Initiative. And elsewhere, or nearby, was the Governor of Florida--'oh we got one too'…So he came back and said 'I want a Million Acre Initiative also!' Given the reality of land loss in the state and the context of a national land protection movement, it is likely that a variety of factors influenced the Governor's decision to initiate a legislative goal.

2.3 Smart Growth Context

National context

As one above respondent indicated, New Jersey and Florida were just two of several states considering conservation initiatives at the turn of the 21st century. Florida Governor Martinez established a $3 billion "Preservation 2000" fund to support natural and cultural resources conservation in 1990. Governor Bush extended the program in 2000, renaming it "Florida Forever". Recently, Governor Crist extended Florida Forever for another decade. To

date these bonds have gone towards conserving 2.4 million acres.

New Jersey Governor Whitman's Open Space Preservation Initiative took place through a public referendum in 1998 where voters approved $98 million in annual bonds for next 10 years to reach Gov. Whitman's goal of one million acres, according to an article in the Trenton Times (4 Nov. 1998). The bonds are administered by the New Jersey Green Acres program, which cites 1.2 million acres conserved (NC DEP).

Emphasis on land protection extended beyond Florida and New Jersey and beyond state jurisdiction. According to the Brookings Institute, 1998 and 2000 were a remarkable years for conservation at the ballot box, as well as for legislative initiatives that did not require voter approval. In 2000, there were 257 open space measures on ballots across the United States, of which 78.2% passed (Myers 1999; Myers 2001).

Open space measures were part of a nationwide debate on the government's role in growth management. State governments initiating growth management through incentives and/or regulation began in the 1960's, but revolution in policy design and implementation hit during the 1990's (Godschalk 2000). Smart Growth Management had become defined as a larger palette of public policy techniques that increase overall quality of life by influencing where growth can occur and what the nature of growth will be. Daniels and Lapping (2005) write that land preservation is an essential part of smart growth palette; it directs growth away from areas where settlement would lead to negative consequences.

North Carolina efforts

North Carolina officials had been responding to the Smart Growth movement before the Million Acre Initiative was even conceived. Gov. Hunt established a Smart Growth

Commission, the 21st Century Communities Task Force to hold public hearings across the state, gathering input on preserving natural resources, land-use planning, transportation, and other growth issues (*Winston Salem Journal*, 15 Sept. 1999). As further evidence of the movement, Representative Joe Hackney (D, District 54), a member of the Task Force, submitted a bill to the House (House Bill 1468) that would authorize counties with growth management plans to establish taxes for school construction on new development (Holm 2000).

A 1999 issue poll with 700 North Carolina registered voters showed conflicting opinions about the role of the government in environmental conservation (The Kitchens Group 2000). The poll asked voters if they agreed or disagreed with statements about conservation. Overwhelmingly the public valued their state's natural resources and heritage and wanted these to be protected for future generations (94% agreed, and within this group 71% strongly agreed). It bothered 77% of respondents to see land bulldozed for development. Furthermore, 76% agreed that citizens owed it to future generation to protect resources even if it meant paying higher taxes. However, when questions turned to options for funding a land protection initiative, there was less consensus among those polled. The poll found 48% would pay $20 a year in taxes to support the Million Acre Initiative, showing that there was support for raising taxes to fund conservation. This was reduced to 30% who would pay $35, and most respondents who agreed positively had post-graduate level education. When it came to specific taxes, 36% supported increased deed stamp tax to fund a Million Acre Initiative and 39% strongly opposed. Adding a monthly surcharge of $2 onto water bills was opposed by 47%. Furthermore, 55% believed that a Million Acres Initiative would let government violate private property rights, showing the majority of those polled

misunderstood the process of voluntary land protection.

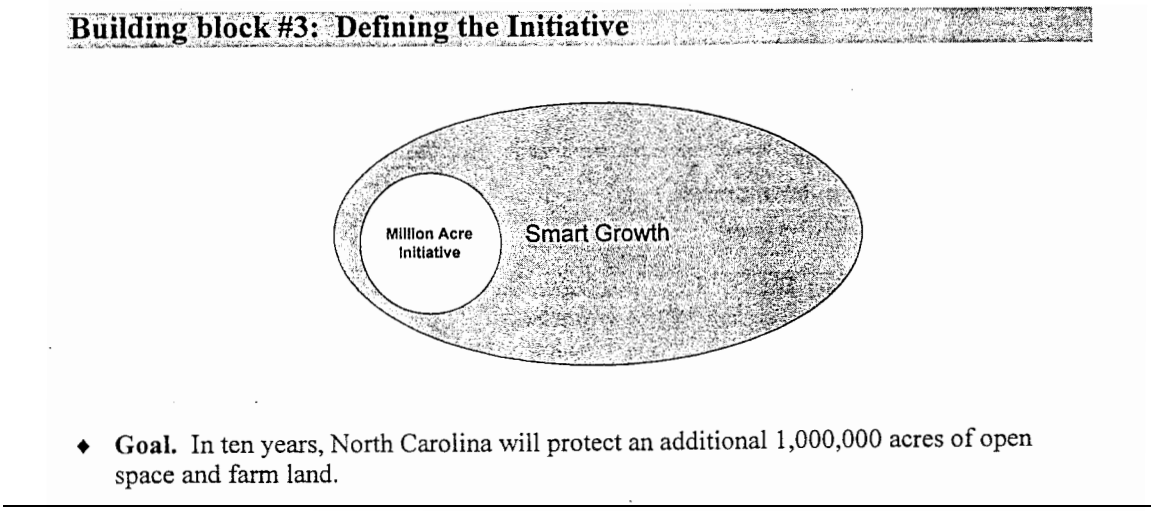


Fig. 2.2 Pictorial excerpt from NC DENR's internal draft of the proposal to create a Governor's Million Acre Initiative, 9 Sept. 1999. The Million Acre Initiative was defined within a larger smart growth context.

2.4 Designing the Initiative

The first public announcement of the Million Acre Initiative was at a Governor's Cabinet meeting in Wilmington in June (Wilmington *Star News*, 8, June 1999). By September 1999, the Governor's Office had charged the Department of Environment and Natural Resources with developing a proposal for a North Carolina Million Acres Initiative. According to an internal email, the development process was opened up to members of the NGO conservation community, including figures from Conservation Trust of NC, Conservation Council NC, NC Wildlife Federation, and NC Chapters of the Sierra Club, the Trust for Public Land, and the Nature Conservancy.

The initial proposal conceptually housed the Million Acre Initiative within the Hunt administration's larger attention to Smart Growth (Fig. 2.2). The objective of land acquisition was to enhance quality of life in the state through protecting farmland, forestland,

water quality, wildlife habitat and ecosystems, cultural heritage, mitigating hazards, and providing recreation; it would also “preserve scenic views, fulfill aesthetic need, and enhance quality of life”. The role of the state would be one of "coordination and support" for conservation institutions, including federal, state, local, and non-governmental organizations.

The initial proposal designed the program to be directed and implemented by three levels of structural support. A Partner's Planning Committee comprised of federal, state, local, and private partners would coordinate planning, evaluate acquisition proposals, and engage in other development of the conservation community. A Citizen Advisory Committee would assist with public outreach, fund raising, and nominate acquisition projects to the Partner's Planning Committee. A Coordinator DENR staff position would act as support for the committees, coordinate public outreach, and monitor the progress of the Initiative.

In response to the initial proposals circulating NC DENR and the Governor’s Office, the NGO community (members from the same institutions listed above) assembled a “strategy” group, organized by the Sierra Club, to offer comments on NC DENR's report and suggest best practices to implement the Initiative long term. In February 2000, they put forth the following:

- Rename and re-define the initiative to allow for a more flexible approach to land and water conservation, to clarify what one million acres would consist of, and emphasize quality over quantity. “Green Infrastructure Program” is proposed as one possible alternative title.
- Integrate the state’s Hurricane Floyd recovery efforts with the state’s land and water preservation initiative.

- Strategize how to fund the four trust funds, at or above last year's level and create a task force to work on improving trust funds and find new funding sources.

These points suggest that nonprofit partners wanted the initiative to connect with Smart Growth's broader principle's about growth management and with recent events, like Hurricane Floyd, to bring saliency to the issue of the protection of natural resources through land conservation.

Gov. Hunt officially announced his MAI plan on April 27, 2000. There would be a coordinator position, but no additional advising or planning committees, and no name change. The bill would not be accompanied by new funding. It would work with existing Trust Fund resources. Hunt is quoted by the News and Observer, "the hard work lies ahead…our resolve today will *help future legislators and future governors direct the resources we'll need to our trust funds* for land conservation" (28 Apr. 2000).

Gov. Hunt challenged the General Assembly to appropriate more to the Trust Funds that year, but a news article titled "'Million acres' bill won't save an acre, but it might send a message" forewarns the state was projecting a $450 million budget shortfall. (Raleigh *News and Observer* 1 June 2000) This led to different reactions from the conservation community.

2.5 Reactions to the Initiative

I interviewed respondents who were working in the conservation field at the time of the Million Acre Initiative's development and passage.[1] The following quotes represent the range of effects and perspectives at that time (my italics):

[1]These interviews are part of a larger examination of the process of land conservation since the initiative's adoption, discussed in chapter three. Respondents were selected from institutions active in land acquisition.

"When Million Acre Initiative got pushed out, I looked at it with skepticism, because even if one governor puts that forward, *administrations change*." [32]

"When it was announced I took it as a primarily political statement. A welcome political statement, but in some respects merely a political statement, and *without a real plan or without designation of real funding sources to facilitate it, I regarded it as kind of a PR initiative* as much as anything." [26]

"The legislation was pretty easy to pass, but it was clear within state government there wasn't the commitment. There was no money, there was no big push. It was a tally sheet. *You've got this acre, you've got this acre, and all you have to do is get your million and you're done*…it was hard not to be cynical." [14]

"In his last year [Gov. Hunt] got the religion and said…'I really regret having not done more for environmental protection'...Suddenly we have a vehicle. Most of the environmentalists and conservationists say '*ok, let's ride this horse as best we can' and attempt to influence additional public funding* for land and water conservation." [19]

"The big kick off campaign of 1999, I think *that sent a signal throughout the state that land preservation was important* so it helped cement the idea in the minds of our [county] leaders here. *It wasn't just staff saying it's important, the governor said state-wide we need to do this*." [33]

These five quotes demonstrate the range of response caused by the Initiative. The Initiative was passed in the last (calendar) year of Gov. Hunt's 4th and final term in office[2], and there was uncertainty about how the succeeding Governor would embrace the mission of reaching a Million Acres and promote it in the General Assembly. The Million Acre Initiative was unlike some conservation policies other being pursued by other states at that time in that it was not accompanied by specified funding. Many conservationists were asking "which million?", emphasizing that not just any random acres that added up to one million would be meaningful ecologically. At the same time, being a Governor's mandate, the Initiative signaled validity to the work of local government conservationists. Conservation professionals were determined to use the Initiative as a "vehicle" to leverage

[2]Gov. Hunt served two terms from 1977-1985 and a 3rd and 4th term from 1993-2001; www.governor.state.nc.su/HistoryCulture/Governors>

funding from the General Assembly for the state Trust Funds.

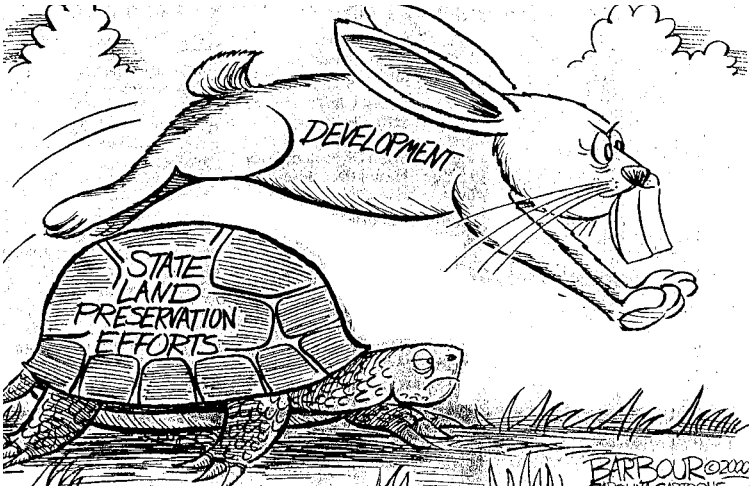


Fig. 2.3 Political cartoon by Carolina Cartoons, Manteo Coastland Times, 7 December 2000.

The media in the following years highlights the shortcomings of the goal rather than achievements. A political cartoon from the Manteo Coastland Times (Fig. 2.3) likens the contest between developers and state preservation efforts, to the tortoise and the hare allegory, and the hare is winning (7 Dec. 2000). Headlines from subsequent years read: "Land protection off to a slow start", (Raleigh *News and Observer*, 20 March 2001), "Million acres running behind" (*Charlotte Observer*, 19 Jan. 2004); "NC short on 1M-acre preservation initiative" (*Mount Airy News*, 31 March 2007).

2.6 Institutional response to the Initiative

From beginning of the Initiative's establishment, state leaders emphasized the necessity of partnerships for carrying out the next decade of land conservation. Bill Holman, Secretary of NC DENR in 2000 wrote in an editorial (Raleigh *News and Observer* 28 Dec. 2000):

"Recent news articles focusing on our progress…have overlooked the burgeoning grass-roots and political support…We have known from the start that our success is dependent upon having many partners on board, especially the nonprofit land conservation organizations, industry, agriculture, and the people of North Carolina"

The Secretary's use of the pronoun "we" emphasizes not only the number of state agencies involved in executing the initiative, but the aspirations that launched the initiative as the catalyst for the establishment of partnerships.

Earlier in 2000, Gov. Hunt sent letters of gratitude to Million Acre Initiative supporters that included the word "partnership" in describing the nature of the Million Acre Initiative and underlining his hopes for the project in bringing together government, business and individual citizens:

"The Million Acre Initiative *is not merely a state government program – it i*s *a partnership* based on a shared goal of protection North Carolina's natural heritage. The partnership consists of conservation groups, local governments, developers, business, and citizens all across our state. Now we must move forward with this initiative; we must preserve those one million acres. I challenge you to support the Million Acre Plan by encouraging North Carolinians to participate in open space and farmland conservation efforts. It will require *perseverance and determination*, but we can reach our one million acre goal by 2010." [3]

The perseverance and determination that would be required to obtain the necessary funding to protect land would come from many sources, but two institutionalized partnerships emerged in particular, Land for Tomorrow and DENR's One NC Naturally. Land for Tomorrow is a lobbying coalition of conservation groups and local government—a bottom-up approach. One NC Naturally is a state agency partnership created to see through the MAI in a coordinated fashion– a top-down approach.

Land For Tomorrow

Land for Tomorrow is a coordinated and collaborative effort to lobby on behalf of the

[3]Letter sent to Chuck Roe, Land Trust Alliance, September 9, 2000.

state conservation trust funds. The institutions affiliated with Land for Tomorrow include land trusts and other local, regional, and national conservation organizations, city and county governments, businesses, environmental nonprofits, neighborhood associations, and agricultural groups. As of 2007 their website boasts over 250 affiliates. The steering committee includes representatives from the Trust for Public Land, the Nature Conservancy, the Conservation Fund, NC Recreation and Park Association, and NC Wildlife Federal, all national organizations with NC chapters, along with the Conservation Trust for NC, an organization that supports land trust activities in NC as well as acts as a land trust itself.

On their website, the organization says that "Land for Tomorrow is North Carolina's best chance to ensure that future generations continue to enjoy clean water and air, vibrant communities and economic progress in our state." This is because Land for Tomorrow speaks as one voice for the four trust funds that bequest millions of dollars to hundreds of institutions and local communities across the state. This voice has proven to be quite effective in gaining attention of the legislature, according to one affiliate of the NC chapter of the Nature Conservancy:

"Through Land for Tomorrow, which is of course a collective effort, we've been able to get enough attention from the General Assembly that the conservation community, for the first time in history, we're no longer sitting at the card table at Thanksgiving, we're sitting at the big table with everybody else."

One component of Land for Tomorrow's successful outreach is Lobby Days at the state General Assembly, to which affiliates of conservation institutions and citizens in general who support conservation funding are invited to collectively meet with their representatives and promote the importance of the trust funds. The Land for Tomorrow website and email list-serve is updated with pressing funding issues that have come up in the General Assembly and encourages people to write their representatives (see Appendix F for

examples from 2009 and 2010). The Green Book, a publication that compiles projects granted by the trust funds, is another important outreach of Land for Tomorrow. Projects are organized by county in order to highlight the local impact of state funding. According to one of the steering committee members of Land for Tomorrow, emphasizing that conservation funding is spent locally, is essential for getting the attention of legislators:

> "I think for certain legislators, especially ones that have been around been in office for a number of years they remember the Million Acre Initiative and it resonates with them. But most of the time what resonates with them is how this-or-that program is going to benefit people in their district. And that's one of the reasons that the Land For Tomorrow coalition began and tried to highlight those purchases in [The Green Book]." [25]

One NC Naturally

One NC Naturally is a governmental initiative to coordinate state conservation efforts within NC DENR. As it stands today, One NC Naturally integrates NC DENR's efforts to (1) provide science on biodiversity, air and water quality, forest and coastal resources, and (2) offer resources and incentives for land conservation, stewardship, restoration, and land use planning to individuals and communities.

Bill Ross, secretary of DENR under Gov. Easley from 2001 to 2009, describes the intent of One NC Naturally to "optimize" public investment for land protection in the wake of the MAI:

> "Part of the aim [of One NC Naturally] was to *answer the question that was unanswered by Governor Hunt's Million Acre initiative. Let's conserve a million acres—which million?*…What are the standards by which you judge importance? How do you optimize the public investment? I mean, that was one of the purposes of the One North Carolina Naturally was to optimize and move the state forward in a way that made sense toward that goal." [20]

The Conservation Planning Tool (CPT) was one of the product outcomes of One NC Naturally. The CPT is a spatially-explicit geographic tool, made available online for interactive viewing and/or download for professionals. The tool shows where the natural

resources (water resources, biodiversity, farmland, and forest) of highest importance are in the state.[4] According to Secretary Ross, "a good map" is an essential and obvious part of coordinating conservation effects. A map displays where resources are, what resources have been conserved, and where conservation gaps exist. The prioritization of resources via a scoring system (see Appendix A for the water resources scoring system) shows where the conservation efforts of the state and other institutions should be focused.

2.7 Conclusion

To date, NC NHP has tracked more than 600,000 acres conserved by state agencies, land trusts, local governments, federal agencies, and other conservation organizations. Much of these projects have been made possible by the funding of the state trust funds. The Million Acre Initiative goal expired on the eve of 2010, quietly without press from the state governor or NC DENR. This does not mean that conservation efforts from land trusts and public agencies, or funding from the state, has ceased; even during the difficult budget times of 2009 and 2010, CWMTF was awarded $50 million and ADFP was awarded $1.5 million.

I argue that the initiative should not only be evaluated on the basis of whether or not it met its tally. The Initiative has come to include other allied goals, including collaboration between institutions and a focused approach to conservation. Since its establishment, the Initiative has absorbed multiple meanings and been renamed, or rebranded, according to one interviewed respondent:

"The Million Acre Initiative was for tracking but One NC Naturally would be proactive and directed…One NC and the Million Acre Initiative are the same, just a new name because new administrations like to have their own branding" [30]

More than 600,000 acres have been conserved since 1999, but this number does not

[4]Details on the design process of the CPT can be found at its website: www.onencnaturally.org

give important meaning to the current state of conservation in North Carolina. Which 600,000 acres were conserved, and why those acres? The Initiative was meant to embrace and encourage efforts from all conservation institutions. Did partnerships flourish since 1999 and was there the funding necessary to carry out conservation deals and the coordination of efforts? To address a more in depth analysis of the process and patterns of land conservation in NC, chapter three uses geospatial analysis to explore what natural resources are conserved and what areas of the state still have gaps in conservation. Chapter four outlines some of the changes in the land conservation field, including state funding increases and the role of innovative partnerships, based on interviews with 39 conservation professionals. The final chapter draws connections between these geographic trends in land protection and institutional evolution, and posits one position on the role of the Million Acre Initiative during the past decade of land conservation in NC.

CHAPTER 3. Geospatial analysis of lands conserved during the Million Acre Initiative

3.1 Introduction

One of the initial steps in strategic conservation planning is assessing *what* is already conserved so that further conservation efforts can be effectively informed (Margules and Pressey 2000). Such "retrospective" analysis is necessary before looking ahead to future conservation possibilities; however, retrospective publications about regional conservation patterns are few (Cronan and Lilieholm 2010). Analyses of land conservation patterns across the continental United States show the majority of protected areas to be at higher elevations on low fertility soils, and only represent a small portion of ecosystem communities (Scott et al. 2001; Dietz and Czech 2005). The National Gap Analysis Project (GAP) is a retrospective initiative by USGS and partners to map land cover, species distributions, and all lands stewarded for conservation purposes nationwide (Jennings 1995). Jennings (2001) has given examples from western states of how conservation gaps, or under-represented resources, can been identified from GAP. In southwest Australia, Pressey and others have explored similar patterns (e.g. Pressey and Taffs 2001). Yuan-Farrel et al. (2005) found that spatial patterns of easements owned by the Nature Conservancy in California are positively correlated with plant diversity and the proportion of private land ownership.

However, local conservation assessments of conservation patterns are essential given the decreasing role of national powers in prioritizing areas and funding conservation, the

increasing role of states in conservation and local governments in conservation, and the fact that land use planning occurs locally (Bengston et al. 2004; Miller et al. 2008). Cronan and Lilieholm (2010) is a rare case study of environmental and socioeconomic patterns on a statewide scale (Maine) for all types of conservation lands.

In North Carolina, although some individual public and private institutions have conducted their own assessments and planning initiatives and there are regional partnerships that have collaboratively identified conservation targets, there has been no empirical statewide examination of what resources are adequately conserved and what resources have unequal representation. There have been efforts to move towards this endeavor. As of 2010 NCDENR completed the design of a series of geospatial tools that map existing conservation lands and represent low and high priority resources and areas for conservation. The Conservation Planning Tool (CPT) is not a conservation plan in the sense of Knight et al. (2006), "strategic, focused on implementation, involving stakeholders and opportunities." It is intended to be a tool to encourage conservation efforts across the state to focus on resources that are of high priority to the state.

This chapter broadly examines patterns of all conservation land in North Carolina, but focuses particularly on the past decade to assess how policy and institutional changes in the state might correlate with conservation patterns. My decision was to use publicly available spatial information, including one tool from the CPT, to cover broad trends of where conservation efforts have been concentrated since 1999. My questions were: what environmental resources have been targeted? Do conservation efforts correlate with socioeconomic factors? How do post-1999 conservation patterns compare to conservation

undertaken before the Million Acre Initiative? What geographic areas and environmental resources remain unequally represented by North Carolina's conservation lands?

3.2 Methods

All analysis was conducted in ESRI ArcMap version 9.3.1. What constituted as conservation land was, in part, defined by the institutions that are listed by NC DENR as having acquired, or otherwise protected, lands for conservation since 1999, thereby making the them partners in the Million Acre Initiative. The institutions include federal agencies, state agencies, private organizations, and local governments. This means that conservation lands could have a variety of biodiversity levels, threats, management regimes, extractive uses, and means of public accessibility. However, all conservation lands have development restricted by ownership or by legal restriction.

3.2.1 Assemble Database

The first step towards addressing the above questions was to assemble a spatially accurate database of conservation lands that would accurately represent the different institutions involved, as well as conservation gains over time. From this database, I sought to create a portfolio of all lands protected after 1999 to represent land conserved during the Million Acre Initiative. The following section outlines the assembly of the database, a task that required data layers with the following information at minimum, (1) spatially accurate representation, (2) attribution to one or more conservation institutions, and (3) year protected.

Data sources

The task of assembling such a database was furthered by several advantages. To keep track of the number of acres conserved during the Million Acre Initiative, NC DENR has annually solicited, kept record of, and published on-line, the number of acres protected by all institutions involved in land protected in the state, including private organizations, local governments, state agencies, and federal agencies, since 1999. These numbers could be used as a metric to compare with GIS.

GIS layers of North Carolina lands managed for conservation purposes is available to the public from at least two on-line sources, NC OneMap, a state government resource for North Carolina geospatial information, and NC DENR's Conservation Planning Tool. Furthermore, the NC Natural Heritage Program (NCNHP) gathers GIS data directly from many individual institutions involved in land protection and makes these available for research purposes and NC DENR employed a staff member from 2000 to 2002, to assemble a Million Acres GIS layer.

The task was immediately presented with several challenges. Neither GIS layer of all lands managed for conservation purposes in the state includes year-protected information. A second disadvantage of these layers is that presumably for simplification purposes, the data managers have consolidated tracts by complex (such as a state park, game land, or other conservation area), rendering it impossible to track how a complex has grown over time. For example, Mount Mitchell State Park was established in 1915, but has increased in size over time, one most recent addition being in 2005. In the aforementioned layers, Mount Mitchell is represented as one single area, not as multiple parcels, rendering it impossible to track how the park has expanded over time.

Furthermore, NC DENR employed a staff member until 2002, to assemble a Million Acres GIS layer, but since 2002, land protection data is scattered among many sources. Data layers from many of these have the same shortcoming as the layers of all land managed for conservation purposes – they lack information on year protected.

Finally, these sources do not necessarily use the same GIS standards for accuracy, and the layers do not necessarily have the same cartographic projection or information on level of protection, tax identification numbers, and institutions involved in protection. Data layers may not have been updated recently. Some institutions do not even maintain GIS records.

Therefore, to assemble a database, data had to be sought from several sources that included the minimum data requirements: spatially accurate, attributed to a conservation institution, and year protected. Table 3.1 lists data layers included in the database, the source of each layer, and a brief description of contents. Data was provided by:

- NC Natural Heritage Program[5]
- NC Division of Parks and Recreation[6]
- NC OneMap[7]
- Mecklenburg County GIS office[8]
- Guilford County GIS On-line and the 2009 Guilford County Open Space Report[9]

[5]Scott Pohlman, Conservation Tax Credit Program, NCNHP, provided on CD, June 2009.
[6]John Amoroso, Division of Parks and Recreation GIS, emailed September 2010.
[7]A state government on-line resource for North Carolina geospatial information: www.nconemap.com.
[8]Scott Black, Mecklenburg County GIS Office, emailed March 2009.
[9]Provided by Parks and Recreation, also found: http://www.co.guilford.nc.us/government/openspace/FinalMay09.pdf.

3.2.2 Create the Million Acres Portfolio

From this database I created a data layer, which is hereafter referred to as a portfolio, of lands conserved after January 1, 1999, or lands conserved under the Million Acres Initiative. The workflow process to create the portfolio is represented in Fig. 3.1 and explained in further detail below. In general, the process consisted of first determining the year of protection for each feature, merging features that were protected after 1 January 1999 into the portfolio, and removing duplicate features.

Determining year protected

The process of developing a post-1999 portfolio was as conservative as possible. If a source data layer (see Table 3.1) contained an attribute field with a date that signified legal protection, all features protected after 1 January 1 1999, were filtered into the post-1999 conservation lands portfolio.

If a data layer did not have an associated date, the following options were investigated.

a) The State Property Office (SPO) tracks and makes searchable on-line[10] Land Assets specifically acquired by the state for conservation purposes. These include lands owned by the state outright and lands were the state owns limited rights (e.g. a conservation easement). A request of the SPO site generated Land Assets conserved after 1 January 1999. These file numbers were joined with SPO file numbers from the State Owned lands data sets (see Table 3.1).

[10] http://www.ncspo.org/fis/mnuReports. aspx

b) Land trust properties in question were investigated through on-line research of individual land trust websites.

If a date of legal protection could not be established for a certain property, the property was not merged into the post-1999 portfolio. Before removing duplicate features the post-1999 portfolio contained 4,793 records.

Spatial overlap and duplication

Land protection is often collaborative between various institutions. These different parties may have interests and/or responsibilities to the same properties (e.g. a land trust may contact and maintain relationships with land owners but purchase of the property will go through a state agency; or a land trust may own a property, and sell a conservation easement to the state; or a land trust may sell a property to the state or to a municipal government, but the land trust will continue to manage the property). The collaborative nature of conservation revealed itself during data collection when datasets from different institutions (e.g. a dataset of state owned lands and a dataset of land trust properties) included the same properties

Duplicate features were identified by calculating for each feature's centroid, X and Y coordinates, 1-meter tolerance. Features with identical centroid coordinates were selected and individually examined to verify that they were indeed duplicates. The attribute information for duplicate features was combined. The spatial information for duplicate features was deleted, resulting in a post-1999 dataset where each record (4,400) represented a unique feature.

Data gaps

Despite communication with various federal offices, I was not able to obtain year-protected information for federally owned parcels. Thus, no federal data was merged into the portfolio. However, according to NCNHP tracking, only 47,000 of the 600,000 acres protected after 1999 were acquired by federal agencies. Natural Heritage Program did not have useful data from at least three land trusts, so they are therefore not represented: Blue Ridge Rural Land Trust, Davidson Lands Conservancy, and National Committee for the New River. I only focus on municipalities who have Open Space programs, and are thus actively acquiring conservation land in a programmatic fashion, and whose data was easily available on-line. To compensate for the uneven representation of municipal level conservation, the database does include data from Clean Water Management Trust Fund, a state funding agency that funds municipal and county projects, from 1999-2004. However, one limitation for CWMTF data is that the features represent the projects' proposal phase boundaries, which can change as legal protection is finalized. The fact that several GIS datasets were not updated most currently is also a limitation. However, the economic downturn of 2008 led to less funding for the trust funds, most likely a decrease in private donations for the private sector, and most likely less land conservation in general, compared to previous years.

3.2.3 Environmental Resources Analysis

Table 3.2 shows the data sources used for analysis. I decided to use publicly available data of interest to a broad audience. I selected water resources, rare and threatened species populations and natural communities, and land cover type as three main environmental resources. Recent state policies concerning water quality, the attention that water receives in

the media, and the fact that CWMTF is largest funder in the state, means that water quality is a salient issue that attracts wide audience of supporters. How well rare populations are conserved shows how well conservation efforts are addressing threats. Land cover types describe the diversity of natural communities conserved, and the communities that are dominantly conserved or remain underrepresented.

I also use the Water Services Assessment from NC DENR's Conservation Planning Tool (CPT). As of 2010, NC DENR completed the development of a series of geospatial tools that represent low and high priority conservation resources and geographic areas. The CPT is intended to help focus conservation efforts across the state. State conservation funding agencies, particularly the Natural Heritage Trust Fund and the Clean Water Management Trust Fund, promote the use of the tool in their funding criteria and encourage applications for properties in areas with the higher scores (personal observation, CWMTF meeting of October 2009; personal communication with a trust fund representative, September 2010). The assessments consider an impressive and comprehensive number of inputs and since this thesis evaluates a state initiative, I felt it appropriate to in turn use a component of the state-generated CPT.

Water resources

To address what water resources have been the target of conservation, I focus on a general analysis of the intersection of surface waters and portfolio lands, and the amount of land conserved per watershed. Secondly, to place this within a larger context of North Carolina conservation efforts, I use the Conservation Planning Tool to identify water

resources of high significance and then analyze the relationship between portfolio lands and these areas.

Surface Waters and Watersheds

Watersheds were represented by NC One Map's Hydrographic units. Major Hydrography from NC One Map represented surface water features (e.g. streams, rivers, lakes and bays) at a 1:24,000 scale. A100-meter buffer was added to surface water features to reduce discrepancies between the spatial representation of water features and the boundaries of conservation lands fronting water features.

High Priority "Water Service Assessment" areas

The Water Services Assessment tool was designed to identify critical water resources that "serve the needs of North Carolina residents" (NCDENR). The design process was spearheaded by professionals from Division of Water Quality, Division of Water Resources, Division of Environmental Health, Ecosystem Enhancement Program, and Clean Water Management Trust Fund. Review and feedback was solicited from other governmental staff, conservation groups, and the wider conservation community. The WSA incorporates 42 data sets (see Appendix A) that represent water quantity, water quality, and water use and consumption. These data sets were weighted and scores combined (i.e. if a grid cell contains multiple resources, the scores are combined to reflect higher value) to generate a conservation priority scoring system across a 30x30 meter raster grid. The final scores for assessment range from 2 to 17; a score of 12 and higher represents "most significant" locations in which to target conservation.

To analyze the relationship between conservation lands and Water Service Assessment Areas (WSA's) of highly significant value, grid cells with a score of 12 or higher were extracted from the Water Services Assessment raster layer and converted to polygon. The polygon was then simplified with the Aggregate tool (350 meter distance maximum), reducing the number of features by over 60-fold while still preserving the shape and extent of the features.

Rare biodiversity

The North Carolina Natural Heritage Program (NCNHP) tracks rare and threatened elements of biodiversity, namely species populations and natural communities. Their list of elements includes federally-listed endangered species as well as species that are rare, or of special concern, but do not have legal protection.

Each occurrence of a population or natural community is assigned an estimated viability level/rank, and an estimated percentage of spatial accuracy of the record (according to what percent of the mapped area is populated by the element). Based on discussions with NCNHP staff, I considered all levels of viability (levels A-E) except "Extirpated", and records with occurrence accuracy equal to or greater than "Medium".

Since the element occurrences data set included overlapping features, it was necessary to calculate a series of dissolves using the Dissolve tool. For example, I dissolved features based on scientific name to generate a single feature for each element tracked by NCNHP. I also dissolved all features to calculate the total area that NCNHP tracks.

Land cover classification

I used two national land cover data sets, the National Land Cover Dataset (NLCD), which maps 21 general land classes, and USGS Gap Analysis Program (GAP), which maps 590 land cover types, to analyze which land types, and what percentage of land types, overlapped conservation lands.

3.2.4 Socioeconomic analysis

I use two socioeconomic metrics to examine the correlation of land conservation efforts with land use and economic development. The NC Department of Commerce annually determines each county's Tier status, a measure of economic well being defined by unemployment, population growth, and per capita income (NCDC 2010; Schweke and Disilvestro 2008). Tier designation determines to what degree a county can qualify for state economic development programs and how investing businesses will be rewarded tax advantages. Counties designated as Tier 1 are most economically distressed and are afforded the most generous advantages, Tier 2 counties are less distressed, and Tier 3 counties are economically healthy. State conservation funding agencies like CWMTF and NHTF also sometimes consider Tier status while awarding grants, favoring Tier 1 counties in particular, because conservation projects are seen as sustainable investment and economic development (personal observation, CWMTF meeting of October 2009; personal communication with a trust fund representative, September 2010). Since Tier designations change annually, and the use of a three-Tier system shifted from a five-Tier system in 2007, the analyses herein refer to each county's Tier value averaged over 2007-2010.

I also consider a metric of county urbanization, the Rural-Urban Continuum from the USDA Environmental Resource Service (2004). The Rural-Urban continuum considers the extent of urbanization within a county as well as the influence of urban centers outside the county's borders.

3.3 Results

3.3.1 All Conservation Lands Database

The conservation lands database represents approximately 4 million acres protected in North Carolina, meaning more than 11% of state has some form of protection. The Conservation Planning Tool "Conservation Areas" layer represented 3.9 million of these acres. Additional compiling from the sources in Table 3.1 added approximately 160,000 acres (2100 features), all conserved after 1999, which were previously not accounted for in the Conservation Planning Tool. The majority of conservation lands (40%) are located in the mountains; the federal government owns 66% of all conservation lands (Table 3.3).

3.3.2 Million Acres Portfolio

Approximately 4,700 features had information signifying legal protection after 1999. After duplicate features were removed, the final portfolio consisted of approximately 4,400 features representing a total of 566,064 acres (Fig. 3.2).

As shown in Table 3.3a, the distribution of post-1999 conservation efforts across physiographic regions is concentrated in the inner coastal plain (34% of portfolio lands), followed by the mountains and piedmont (25% and 24% respectively).

The state is attributed as owner for 357,786 (63%) acres in the portfolio; 191,628 (34%) acres are attributed to land trusts; 16,650 acres (3%) to municipalities. These values are misleading, however, because the conservation of many, perhaps a significant majority, of these acres took the efforts of multiple institutions. Approximately 9.5% of features in the post-1999 portfolio were duplicates, meaning they were assembled from multiple source layers. Further evidence, though more difficult to quantify, is the indication from the state conservation properties data layer and the state-owned conservation easements data layer, that many properties were granted to the state from land trusts, cities, and counties. Although collaboration is hinted at in the fields of some GIS data layers, any quantification of collaboration is difficult, if not impossible, given the limitations of available data.

3.3.3 Environmental Resources

Water resources

The Cape Fear River is the state's largest watershed. Accordingly, more conservation lands have been conserved within it, before and after 1999 (Table 3.4). Watersheds that have proportionately more land conserved compared to their extent are the Little Tennessee and French Broad rivers (15.55% and 12.76% of conservation lands, respectively), both of which lie in the western part of the state. Since 1999, conservation efforts have shifted to more conservation in Piedmont and Coastal Plain watersheds, including the Tar River (from less than 1% of land conservation before 1999 to 4% of land conservation after 1999), the Lumber River, the Albemarle Sound, the Neuse River, and the Yadkin-Pee Dee River watersheds. In the mountains, the Broad River and Catawba River watersheds have also seen increased conservation efforts over the past decade.

The majority of lands conserved after 1999 directly target water features. Approximately 53% (297,134 acres) of Million Acre Portfolio lands contain or are intersected by surface waters. The total length of surface waters that traverse portfolio lands is equal to 1,050 miles. Land has been protected most along waters that flow into the Albemarle Sound (the Chowan and Pasquotank river basins), along waters in the Cape Fear Basin, and along waters in the Tar-Pamlico river basin (Table 3.5).

Assessing the relationship between conservation lands and NC DENR's Water Service Areas of high significance indicates how conservation efforts since 1999 have focused on sensitive or otherwise important water targets. A total of 19,942 acres of portfolio lands are located in highly significant Water Service Areas (WSA) (Table 3.6). The Albemarle Sound highly significant WSA and Catawba River highly significant WSA saw the most number of acres conserved since 1999 (Fig. 3.3). On average, 5.2% of statewide highly significant WSA are conserved The two service areas with the greatest proportion of portfolio acres to total size of highly significant WSA are the Broad River and Chowan River (13.8% and 11.3% of these WSAs are conserved).

Rare biodiversity

NCNHP tracks 110 natural communities and 599 species (709 elements total), ranging across a tracking area of 1,251,795 acres. The concentration of elements is divided between the coastal plain (82% of tracking area), with the remaining 10% in the mountains and 8% in the piedmont. This imbalance is influenced by the fact that the two elements with the largest extents occur in the coastal plain, the Shortnose Sturgeon (*Acipenser brevirostrum*), with a 453,000 acres range, and the Cypress-Gum Swamp landscape indicator

guild, with a 178,364 acres range. However, even if these two elements are excluded from analysis, the coastal plain still contains 65% of NCNHP's tracked diversity. US FWS lists 61 federally endangered species in NC (USFWS 2011); NCNHP tracks 30 of these and an additional 63 state endangered species.

Almost half of the elements (n=330, 47%), and more than half of the natural communities (n=75, 68%), occur on Million Acre Portfolio lands, including 21 federally endangered species and an additional 30 state endangered species. Furthermore, 53 species or natural communities are tracked on lands conserved after 1999 that are not tracked on lands conserved previously, meaning these have been newly protected since 1999. The geographic distribution of elements tracked on portfolio lands mirrors that of overall NCNHP tracked diversity: 74% in the coastal plain, followed by 20% in the mountains and 6% in the piedmont. Table 3.7 lists the five natural communities that have over 70% of their tracked area on portfolio lands. Three are mountain communities and two are endemic to the coastal plain.

For those elements occurring on lands conserved after 1999 (n=330), the quartile distribution of the percent of range tracked occurring on lands conserved after 1999 is shown in Fig. 3.4 to highlight that the majority of elements actually have only a small percentage of their tracked area on portfolio lands. However, there are 32 elements with more than 90% of their tracked range occurring on lands protected after 1999 (Table 3.8); these elements are mostly all vascular plants that occur either in the mountains or in the inner coastal plain, or other elements associated with restricted communities.

Lands conserved after 1999 have been important for newly conserving endangered species (Fig. 3.5). Twenty-one federally endangered species are tracked on Million Acre

Portfolio lands; six of these species are only tracked on lands conserved after 1999, and not tracked on any other conservation or private lands; these species include the Carolina Northern Flying Squirrel (*Glaucomys sabrinus coloratus),* Little Wing Pearlymussel (*Pegia fabula)*, Harperella (*Ptilimnium nodosum*), and the Tar River Spinymussel (*Elliptio steinstansana*)

Land Use

National Land Cover Data (NLCD) maps 15 land cover types in North Carolina. Agriculture and pastureland cover 21% of the state, and one tenth of the state is developed.[11] According to NLCD, 36% of portfolio land is wetland (land with saturated soils), and 36% is deciduous forest (Fig. 3.6). The next largest classifications represented on portfolio land are evergreen forest (13%) and crop and pasture land (7%).

GAP maps 81 land classifications in North Carolina (Fig, 3.7) and allows a more detailed look at land cover in the state, particularly at the categories of deciduous forest and wetland that are so distinguished by the NLCD. Portfolio lands contain 76 land cover types, but for simplification purposes I group the cover classes into 21 categories (a full list of GAP types is found in Appendix C). Riverine floodplain forest and nonriverine swamp and pocosin cover a combined 34% of portfolio lands (Fig. 3.8), supporting the NLCD data's showcasing of woody communities with saturated soils. The importance of deciduous forest is also supported by GAP. Appalachian mountain deciduous forest covers 24% of portfolio lands; there is only a small portion of Piedmont and Coastal Plain hardwood forest represented. Mixed forest instead is important in portfolio lands in the Piedmont (9% is

[11]A developed area is defined by being more than 20% covered with impervious surface, and vegetative cover is predominately herbaceous (grass). NLCD maps 4 classes of developed: developed open space, low intensity development, medium, and high intensity development.

covered by Piedmont Oak-Pine mixed forest) and Coastal Plain (2% Coastal mixed forest). Other land categories pronounced on portfolio lands are managed Pine plantation (7%), agricultural land (6%), and Longleaf Pine communities (6%).

3.3.4 Socio-Economic Factors

Forty-one of the state's 100 counties are designated as Tier 1, or economically distressed. Tier 1 counties have seen the majority of acres conserved since 1999 (215,120 acres), but this is proportional to the geographic extent of Tier 1 counties: Tier 1 counties make up for 40% of the state's area and 40% of the conservation efforts since 1999 (Fig. 3.9). The most economically stable counties have seen proportionally more conservation since 1999. The Rural-Urban Continuum shows that highly urbanized counties (those with large metropolitan populations) have had a greater share of conservation efforts since 1999: they contain over 40% of portfolio lands. Since 1999 there has also been more focus in rural counties that are flanked and influenced by urban counties.

3.4 Discussion

3.4.1 NC Conservation Hotspots

Overall, conservation land statewide is concentrated in rural counties. In the All Conservation Lands database, 40% of conservation land is located in the Blue Ridge Mountains region; this is significant given the comparative size of NC's physiographic regions.[12] The eight counties with more than 30% of their land base under conservation are located in the mountains (Fig. 3.10). Swain County, located towards the far western edge of

[12]The ratio of the size of physiographic regional areas is roughly: 1 (Mountains): 2½ (Piedmont) : 2 (Inner Coastal Plain): 1 (Outer Coastal Plain).

the state, has 71% of its area in conservation. Appalachian deciduous forest, which covers 12% of the state's area, comprises over 35% of conservation lands. Conservation efforts appear to have simultaneously focused on more restricted mountain communities; high elevation spruce-fir forest, mountain bogs, grass and shrub balds, and rocky montane cliffs, all have a higher percentage of representation on conservation lands than they do in the state. Although most land is owned by the federal government, the Nature Conservancy and eight local land trusts (almost half the number of local land trusts in the state) are also active in the mountains according to GIS data layers.

The coastal plain has also seen significant efforts; the inner coastal plain and outer tidewater region combined represent 50% of conservation land. Ownership of land is mixed in the coastal plain; there are federal wildlife refuges and coastal reserves, state parks and game lands. The Nature Conservancy is active in acquiring land, along with three multi-county land trusts and two land trusts focused on particular coastal islands.

3.4.2 Changes Since 1999

Regional patterns

Conservation since 1999 been more of an urban endeavor, as conservation lands have been located in more urbanized counties or counties influenced by urban areas. Lands in and around urban areas may have been targeted where lands are under higher threat and financial resources are concentrated (for example, the municipal Open Space programs in the state belong to urban counties like Durham, Orange, Guilford, and Mecklenburg). Or this may be because of the fact that NC is increasingly becoming urbanized and the great majority of NC is under urban influence.

Although the extended coastal plain region accounts for 50% of portfolio lands and conservation land in coastal watersheds—namely the Albemarle and Pamlico Sounds—has increased significantly since 1999, overall, conservation efforts have been more balanced across the physiographic regions (Table 3.3). Since 1999, more attention has been given to the Piedmont. Counties that have experienced the majority of conservation since 1999 are located in the Piedmont, with some notable exceptions in the outer coastal plain (Fig. 3.10): over 50% of the conservation land in Brunswick, Chowan, Perquimans, and Pamlico counties was established after 1999. Piedmont counties Lincoln, Rowan, Sampson, and Franklin, have also seen great strides in conservation. (Appendix D shows land conserved by county).

Franklin County's successes are worth highlighting because they represent a new conservation target area in the state. Over the past 10 years, conservation in Franklin County increased from 548 to 9,788 acres, and the majority of acres protected are along the Tar River. Acreage in the conservation lands database is attributed to one of the state's newer land trusts, the Tar River Land Conservancy. The organization was established in 2000, and it is evident from the database and CMWTF reports that the organization's work has benefited from the state trust fund (upwards of 30 awards from 2003 to 2009, totally over $3.5million) along with private funding (CWMTF 2010). Other counties that the Tar River runs transverses (Person, Nash, Edgecombe) have had conservation increase upwards of 30%; GIS data gives credit to the Tar River Conservancy and the Nature Conservancy.

Rowan County is indicative of another Million Acres Portfolio trend, increased representation of conserved agricultural land. Statewide, conservation efforts focused on crop and pasture have doubled since 1999 according to GAP land cover data. In Rowan County, where 72% of conservation land was protected after 1999, the majority of portfolio

tracts are farmland easements. A firmer number on the statewide extent of agricultural easements is difficult to obtain. Very few datasets include a description of easements—if the type of protection (i.e. fee simple or easement) is noted at all.

The snapshot of recent conservation activity afforded by the Million Acres Portfolio also shows an overall trend of increasing connectivity: 65% of portfolio lands (369,813 acres) abuts previously established conservation areas. Conservation tracts in the Piedmont are smaller and less contiguous.

Individual state preserves

The federal government is responsible for 67% of the conservation land in NC. However, the state is attributed as owner for over 60% of portfolio lands demonstrating a distinct change over time in the federal government's role over time. Although the portfolio does not contain federal land, NCDENR (2009) reports that federal agencies have acquired 45,000 acres since 1999; this is compared to the state's 358,000 acres represented in the Million Acres portfolio.

Several state parks and game lands protected since 1999 have significantly contributed to overall post-1999 patterns. These conserved areas are extensive, and are examples of inter-institutional collaboration, specifically local land trusts and the Nature Conservancy working with Wildlife Resources Commission and Division of Parks and Recreation. Several state areas can also claim high concentrations of NCNHP tracked biodiversity.

Waccamaw and Juniper Creek Game Lands are situated in Brunswick and Columbus Counties. These areas were protected by the Nature Conservancy working with the Wildlife

Resources Commission. The game lands contain a high diversity of natural communities, including Pond Pine woodland, pine savannah, blackwater Cypress-Gum swamp, blackwater coastal plain bottomland hardwood forest, high pocosin, and coastal fringe evergreen forest. Almost 90% of NCNHP's tracked Atlantic White Cedar (*Chamaecyparis thyoides*) population occurs at Juniper Creek. Several species of importance are solely protected the game lands, including the Waccamaw River Spiderlily (*Hymenocaulis pygmaea*) (S1), Little Metalmark Butterfly (*Calephelis virginiensis*) (S2), Carolina Grass of Parnassus (*Parnassia caroliniana*) (FSC), Waccamaw Spike (*Elliptio wacamawensis*) (FSC), and the Waccamaw Silverside (*Menidia extensa*) (FT).[13] Also tracked by NCNHP in the game lands are Cooley's Meadowrue (*Thalictrum cooleyi*) (E), Spring-Flowering Goldenrod (*Solidago vena*) (FSC), Red Cockaded Woodpecker (*Picoides borealis*) (E), Rough-leaf Loosestrife (*Lysimachia asperulifolia*) (E), and Venus Fly Trap (*Dionaea muscipula*) (FSC).

On the western end of the state, Watauga County's *Elk Knob State Park* and *Bald Mountain* contain the rare northern subtype Southern Appalachian Bog that hosts a high diversity of rare species. NCNHP tracks Gray's Lily (*Lilium grayi)* (FSC), Cranberry (*Vaccinium macrocarpon*) (SR), Vesper Sparrow (*Pooecetes gramineus*), multiple species of Sphagnum moss, and multiple species of rare Sedges, and 100% of NCNHP's tracked Canada Yew (*Taxus canadensis*) (SR) population in this region. Portfolio data attributes efforts to the Nature Conservancy and High County Conservancy working with the Division of Park and Recreation.

[13] S1 = critically imperiled rank of extinction risk in the state; S2 = imperiled rank of extinction risk in the state; SR=rare in the state; E= Federally Endangered; FSC = Federal Special Concern; FT = Federally Threatened.

Other state areas are important for aquatic species habitat, such as *Needmore Game Land*, an effort taken on by the Nature Conservancy, the Land Trust for Little Tennessee, and the Wildlife Resources Commission, which contains 72% of the tracked range of the federally endangered Littlewing Pearlymussel (*Pegia fabula*). Two more newly established state parks are centered around rivers, *Mayo River State Park* and *Haw River State Park* (both of which involved the efforts of Piedmont Land Conservancy), and NC DPR since 1999, working with land trusts, has continued to add on to *New River State Park* and *Eno River State Park*. The newly established *Gorges State Park* and *Carvers Creek State Park* both have water resources as the focal point of resource conservation (NCDPR 2010).

Water protection

Just over 50% of Million Acres Portfolio parcels are intersected by, or physically contain, water features. This number is an underestimate of how many acres have been conserved to target water. Observation of the datasets infers that there are many portfolio lands that do not contain water but are adjacent to parcels that contain water. These adjacent tracts are important because they build larger protective networks around targeted water resources. If analysis is expanded to include such adjacent tracts, the proportion of portfolio lands that target surface waters increases to 66%. Water protected is likely even greater than these numbers convey: CWMTF records that it has funded protection of almost half a million acres alone (personal communication, Richard Rogers, April 2010). Since spatial information for CWMTF projects was only available through 2004, further analysis on what kinds of water resources in what regions of the state have been protected would be enhanced through more data.

The analyses here have only considered major surface water bodies, not wetlands, ephemeral streams, or other hydrologically-influenced environments that are highly valued habitats and receive attention from CWMTF and federal grant agencies. NLCD and GAP provide some indication that these features have been targeted by conservation. Riverine floodplain forest, swamp, pocosin, and tidal marsh (all environments with varying degrees of saturated soils) comprise 27% of all conservation lands, and 36% of portfolio lands, whereas they cover only 12% of the area of the state.

Evaluation of the success of water protection efforts in North Carolina is a difficult exercise. The endeavor to protect water resources is challenging in many ways, not the least being the size of watersheds and the scope of human activities and land uses that pollute ground and surface waters. Land protected immediately adjacent to waterways is not insulated from the effects of the greater watershed, nor are conservation institutions in control of the consequences of upstream activities. According to Abell (2002), "for all but a fraction of the world's freshwater habitats, there is a dearth of information on numbers or types of species, the habitats they use, or broader biogeographic patterns…Even when we know what needs saving, in many cases we don't know how to save it." This is one reason why strategic conservation planning for freshwater protection is a young field with few examples of evaluation of implementation (Nel et al. 2009).

Furthermore, King & Fairfax (2004) question the paradigm that land acquisition and easements alone can be a sustainable strategy for protecting water quality, given the challenges of monitoring, enforcing, and property laws that muddy the relationship between land and water rights (or, as is the case in parts of the Western United States, completely divorce the two). The authors warn that efforts to protect land adjacent to water resources

should not assume water protection comes hand-in-hand. More examples of how to meaningfully evaluate water protection efforts are needed.

3.4.3 Unequal Representation

Although conservation efforts since 1999 have been largely focused on under-conserved areas in the Piedmont and Coastal Plain, those counties that have seen the majority of conservation land established since 1999 still have on average only 2.4% of their county area in conservation. For most counties outside the western mountains, a very small percentage of their domain lies in permanent conservation (Fig. 3.10).

Accordingly, the land classification types with low representation are piedmont mixed forest and coastal plain mixed forest and the river watersheds with the least land conserved compared to their extents are those that have the majority of their territory in the Piedmont and Coastal Plain: the Roanoke, the Tar, the Yadkin-Pee Dee, the Neuse, and the Lumber rivers. Although water protection has been a major focus of conservation efforts, the highly significant portions of Water Service Assessment areas need further attention, particularly those in the outer coastal plain along the Pamlico Sound, Albemarle Sound, and lower Atlantic coast.

Assessing the state of rare species conservation is difficult because we only know about those species that have been inventoried. NCNHP tracks 709 elements of biodiversity (species and natural communities). There are 423 elements that have populations that are not on any conservation lands, presumably meaning they are found on privately owned land or public land not managed for conservation purposes. There are 121 elements that do not occur on lands in the All Conservation Lands layer, meaning these 121 species or natural

communities currently have little protection, if any at all (see Appendix E for full list). The distribution of these under-protected elements is balanced across the state. This means that a disproportionate amount occur in the piedmont since 40% of the under-protected elements occur in the piedmont and only 8% of NCNHP's tracked area is in the piedmont.

3.4.4 Data Insufficiencies

The creation of the Million Acres Portfolio was limited by the quality of spatial data kept by conservation institutions and how that data is made available to the public. NCNHP annually solicits protected acreage totals from conservation institutions, and publishes a total of 589,685 acres conserved from January 1999 to the end of 2007. The portfolio dataset is shy of this number by almost 50,000 acres.

Data insufficiencies make it difficult to track conservation patterns over time. For this reason, it is important to note that the trends seen evolving on Portfolio lands could have begun before 1999. The literature supports this for some trends. For example, Raymond and Fairfax (2003) treat the decades-long diminishing role of the federal government in both acquisition and grant funding. In response, state conservation influence has grown and more private organizations (Brewer 2003) and municipalities (Myers and Puetes 2001; Benston 2004) have stepped in to protect environmental resources from development. My data compilation supports this trend. Also supported by my analysis, the growth of farmland easements and protection carried out by institutions at all levels has increased over recent years (Brewer 2003).

Data insufficiencies were particularly pronounced for municipal or county-level conservation lands. Very little coordinated effort has gone into assembling such data. Wake,

Orange, Durham, Mecklenburg, and Guilford (all large metropolitan counties) have Open Space programs that are actively acquiring land, or otherwise conserving land through easements, and therefore have a contact person or online spatial information to download. Other counties have specialized programs, for example Buncombe's farmland conservation program, that have a lower profile. Although all counties now have GIS parcel information online (links found at http://www.doa.state.nc.us/spo/ county.htm), the usability can be difficult, especially when a user is interested in trends and not just one or two parcels.

Different definitions of open space and conservation will also complicate this endeavor, but good data management will include as much information as possible, including public accessibility, date protected, type of conservation (e.g. owned outright; easement), along with a description of use (e.g. greenway; nature preserve; golf course) so that researchers wanting to analyze patterns will be limited by their imagination, not the data.

3.5 Conclusion

This assessment has shown that conservation since 1999 has focused on different priorities than those of prior years but there are many further questions and avenues to explore regarding the patterns of conservation lands in NC. For example, research should use NC WRC's Wildlife Action Plan to look at conservation of wildlife-valued species. The extent and pattern of agricultural conservation could be studied either through a focused data collection effort or through isolating GAP cultivated land types. Land use surrounding conservation lands could be examined to determine the pressures that conservation lands face. And the connectivity of lands could be studied to highlight regions where corridors and networks could be efficiently established. These analyses will lead to questions about stewardship. What does it mean, for example, that the state government has grown, and is

continuing to grow, its land holdings, and that these holdings warrant management? What does it mean that more conservation land now exists within an urban matrix, or that conservation lands in the Piedmont are more fragmented? Stewardship will undoubtedly demand more resources in the years to come.

CHAPTER 3 TABLES

Table 3.1 Data layers referenced for the All Conservation Lands database.

DATA LAYER	SOURCE	UPDATED*	DESCRIPTION
Open Space and Conservation Lands	CPT	2009	Land managed for conservation and open space
State Owned	NC OneMap	2007	State-owned properties
Conservation Tax Credit Properties	NC OneMap	2009	Properties donated to the state in return for a tax credit
State Owned Conservation Easements	NCNHP	2009	State-owned conservation easements
Division of Parks and Recreation Million Acres Lands	DRR	2009	Properties acquired by state parks since 1999
CWMTF	NCNHP	2004	Private organization and public agency projects awarded CWMTF funding
Orange County Open Space	NCNHP	2007	Owned fee simple, easement, or managed
Mecklenburg County Open Space	GIS Dept.	2009	Fee simple, easement, or managed
Guilford County Open Space	GIS Dept.	2009	Tracts listed in the 2009 Open Space report were identified in the GIS Parks and Open Space layer
Land Trust Conservation Properties	NC OneMap	2008**	Fee simple, easement, or managed***
Catawba Lands Conservancy****	NCNHP	2008	Fee simple, easement, or managed
Eno River Association	NCNHP	2009	Fee simple, easement, or managed
High Country Conservancy	NCNHP	2009	Fee simple, easement, or managed
Highlands-Cashiers Land Trust	NCNHP	?	Fee simple, easement, or managed
Land Trust for the Little Tennessee	NCNHP	?	Fee simple, easement, or managed
Landtrust for Central NC	NCNHP	2006	Fee simple, easement, or managed
Lumber River Conservancy	NCNHP	2002	Fee simple, easement, or managed
Pacolet Area Conservancy	NCNHP	2004	Fee simple, easement, or managed
Piedmont Land Conservancy		2007	Fee simple, easement, or managed
NC Coastal Land Conservancy	NCNHP	2008	Fee simple, easement, or managed
Sandhills Area Land Trust	NCNHP	2004	Fee simple, easement, or managed
Southern Appalachian Highlands Conservancy	NCNHP	2009	Fee simple, easement, or managed.
Tar River Lands Conservancy	NCNHP	2008	Fee simple, easement, or managed
Triangle Land Conservancy	NCNHP	2009	Fee simple, easement, or managed

*** Or date of most recent project included in file.**
**** Only 1 land trust submitted properties for 2008.**
***** Properties may have been transferred to another institution, such as a state agency.**
****** The following land trusts had additional properties that were not included in LTCP.**

Table 3.2 Data sources used for analysis.

DATA LAYER	SOURCE	DESCRIPTION
Water Service Assessment	CPT	Areas of conservation priority according to multiple criteria: e.g. biodiversity, water quality, recreation, shellfish harvesting, drinking water (score 1-12)
Major Hydrography	NC OneMap	Surface water features (streams, rivers, lakes, sound, ocean)
Hydrologic Units	NC OneMap	Watersheds
Element Occurrences	NCNHP	Locations and extent of rare and threatened species populations and natural communities tracked by NCNHP
GAP Land Cover	SE Gap	Land cover according to Gap Analysis Project
National Land Cover Data	USDA	Land cover according to the NLCD
NC Counties	NC OneMap	County extent and county demographics
Rural-Urban Continuum	USDA ERS	Metric of urbanization and urban-influence on a county level (score 1-9)
Tier Designations 2007-2010	NC Dept. of Commerce	Designation of economic well being and eligibility for state tax relief (score 1-3)

Table 3.3a Types of institutions attributed as being responsible for conservation lands.

	MILLION ACRE PORTFOLIO		DATABASE ALL CONSERVATION LANDS	
	ACRES	%	ACRES	%
Private/Nonprofit Organization	191,628	33.9%	286,996	7.1%
Municipal	16,650	2.9%	75,682	1.9%
State	357,786	63.2%	932,013	23.0%
Federal	0	0%	2,665,673	65.7%
Other*	0	0%	94,098	2.3%
Total	566,064	100%	4,054,463	100%

* Attributed in the CPT Open Space and Conservation Lands layer as either "private", "multiple", or "other public".

Table 3.3b Distribution of conservation lands across physiographic regions.*

	MILLION ACRE PORTFOLIO		DATABASE ALL CONSERVATION LANDS	
	ACRES	%	ACRES	%
Mountains	138,652	25%	1,679,789	41%
Piedmont	138,146	24%	519,088	13%
Inner Coastal Plain	190,409	34%	1,010,368	25%
Outer Coastal Plain	98,857	18%	84,5218	21%
Total	566,064	100%	4,054,463	100%

* Physiographic regions are according to:
North Carolina Geologic Survey. 2004. Physiographic Map of North Carolina. Accessed Oct 1, 2010. Available: http://www.geology.enr.state.nc.us/proj_earth/proj_earth.html

Table 3.4 Distribution of conservation lands across watersheds.

WATERSHED (Ranked in order from largest to smallest)	% OF ALL CONSERVATION LAND IN WATERSHED	% OF PORTFOLIO LAND IN WATERSHED
Cape Fear River (16.95% of state)	13.53%	18.21%
Yadkin-Pee Dee River (14.26%)	5.27%	8.50%
Neuse River (10.89%)	5.92%	7.53%
Atlantic Ocean (8.54%)	9.49%	6.33%
Albemarle Sound (7.56%)	10.77%	12.20%
Roanoke River (6.71%)	3.98%	2.99%
Tar River (5.89%)	1.34%	4.28%
Catawba River (5.86%)	6.78%	9.14%
French Broad River (5.66%)	12.76%	9.88%
Lumber River (5.18%)	2.74%	7.49%
Pamlico Sound (3.53%)	4.64%	2.47%
Little Tennessee River (3.36%)	15.55%	2.07%
Broad River (2.84%)	1.48%	4.54%
New River (1.43%)	0.78%	2.12%
Hiwassee River (1.02%)	3.52%	0.18%
Savannah River (0.32%)	1.46%	2.07%

Table 3.5 Length of river that intersects lands in the Portfolio.

RIVER BASIN	LENGTH THAT INTERSECTS MILLION ACRES PORTFOLIO (MILES)
Broad River	18.27
Cape Fear River	214.78
Catawba River	108.40
Chowan River (Albemarle Sound)	29.60
French Broad River	33.63
Hiwassee River	0.80
Little Tennessee River	40.91
Lumber River	76.34
Neuse River	98.92
New River	17.24
Pasquotank River (Albemarle Sound)	139.40
Roanoke River	49.44
Tar-Pamlico River	119.24
Watauga River	4.00
White Oak River (Atlantic Ocean)	30.77
Yadkin-Pee Dee River	68.07
Total	1049.79

Table 3.6 Conservation in Water Service Areas of high significance.

WSA BASIN	SIZE OF WSA (ACRES)	AREA CONSERVED PER WSA ON PORTFOLIO LANDS (ACRES)	PERCENT OF WSA ON PORTFOLIO LANDS
Albemarle Sound	71,689.1	2,353.5	3.3%
Broad River	2,919.9	402.1	13.8%
Cape Fear River	41,215.3	1,419.4	3.4%
Chowan River	641.0	72.4	11.3%
Catawba River	52,840.7	3,428.6	6.5%
French Broad River	51,522.0	1,781.5	3.5%
Lumber River	22,249.7	1,159.8	5.2%
Little Tennessee River	43,411.7	1,745.5	4.0%
Neuse River	22,831.2	826.8	3.6%
New River	15,296.2	668.0	4.4%
White Oak River	3,041.1	225.6	7.4%
Pamlico Sound	117,693.4	503.8	0.4%
Roanoke River	5,620.4	411.6	7.3%
Savannah River	6,408.1	214.0	3.3%
Southern Coastal region	111,507.4	1,311.2	1.2%
Tar River	26,643.7	1,719.1	6.5%
Yadkin-Pee Dee River	45,555.2	1,706.3	3.7%
Total	641,086.0	19,949.2	3.1% of total statewide WSA area

Table 3.7 Top five natural communities with the highest percentage of tracked population on lands conserved since 1999.

NATURAL COMMUNITY	TOTAL AREA TRACKED (ACRES)	AREA TRAKCED ON MILLION ACRE PORTFOLIO LANDS, (ACRES)	% OF TOTAL AREA ON MILLION ACRE PORTFOLIO	STATE/ GLOBAL RANK
Montane Red Cedar-hardwood woodland	12.584	12.584	100.0% (Y)	S1?/GNR
Mesic pine flatwoods	17.469	17.369	99.4%	S3/G5
Peatland Atlantic White Cedar forest	642.227	569.465	88.7%	S2/G2
High elevation seep	721.795	544.370	75.4%	S2S3/G3
Montane mafic cliff	119.242	89.038	74.7%	S1/G2?

Y = Tracked only on land protected after 1999.

S1-S5 and G1-G5 = rank of extinction risk in the state and rank of extinction risk globally (or across the species' range); 1 = critically imperiled;
2 = imperiled; 3 = vulnerable; 4 = apparently secure; 5 = secure; GNR = not ranked; "?" = exact rank not known by NCNHP.

Table 3.8 Elements with over 90% of their tracked population on land conserved after 1999. All except 5 of these elements are protected only on land conserved after 1999 (otherwise the remaining tracked population is on land not in the conservation database).

SCIENTIFIC NAME	COMMON NAME	TOTAL AREA TRACKED (ACRES)	AREA TRAKCED ON MILLION ACRE PORTFOLIO LANDS, (ACRES)	% OF TOTAL AREA ON MILLION ACRE PORTFOLIO	PROTECTED ONLY ON MILLION ACRE PORTFOLIO*	STATE STAUS	FEDERAL STATUS
Glaucomys sabrinus coloratus	Carolina Northern Flying Squirrel	136.616	136.616	100.0%	Y	E	E
Scutellaria ovata ssp. rugosa var. 1	Appalachian Skullcap	116.885	116.885	100.0%	Y	SR-T	
Satyrium edwardsii	Edwards' Hairstreak	21.179	21.179	100.0%	Y	SR	
Sphagnum capillifolium	Northern Peatmoss	12.868	12.868	100.0%	Y	SR-P	
Montane red cedar-hardwood woodland		12.584	12.584	100.0%	Y		
Sphagnum flexuosum	Flexuous Peatmoss	11.121	11.121	100.0%	Y	SR-P	
Taxus Canadensis	Canada Yew	10.438	10.438	100.0%	Y	SR-P	
Carex oligosperma	Few-seeded Sedge	7.801	7.801	100.0%	Y	E	
Carex lasiocarpa var. Americana	Slender Sedge	7.619	7.619	100.0%	Y	SR-P	
Sphagnum russowii	Russow's Peatmoss	4.765	4.765	100.0%	Y	SR-D	
Sphagnum contortum	Peatmoss	3.249	3.249	100.0%	Y	SR-D	
Sphagnum fallax	Pretty Peatmoss	3.249	3.249	100.0%	Y	SR-P	
Polygala senega	Seneca Snakeroot	2.470	2.470	100.0%	Y	SR-D	
Smilax hugeri	Huger's Carrion-flower	1.192	1.192	100.0%	Y	SR-P	
Menyanthes trifoliata	Buckbean	1.068	1.068	100.0%	Y	T	
Polemonium reptans var. reptans	Jacob's Ladder	0.852	0.852	100.0%	Y	SR-P	
Euphydryas phaeton	Baltimore Checkerspot	0.649	0.649	100.0%	Y	SR	
Micranthes pensylvanica	Swamp Saxifrage	0.527	0.527	100.0%	Y	SR-P	
Allium sp. 1	Savanna Onion	0.410	0.410	100.0%	Y	SR-L	FSC

Table 3.8 continued…

SCIENTIFIC NAME	COMMON NAME	TOTAL AREA TRACKED (ACRES)	AREA TRAKCED ON MILLION ACRE PORTFOLIO LANDS, (ACRES)	% OF TOTAL AREA ON MILLION ACRE PORTFOLIO	PROTECTED ONLY ON MILLION ACRE PORTFOLIO*	STATE STAUS	FEDERAL STATUS
Dicentra eximia	Bleeding Heart	0.406	0.406	100.0%	Y	SR-P	
Trillium simile	Sweet White Trillium	0.356	0.356	100.0%		SR-L	
Utricularia cornuta	Horned Bladderwort	0.211	0.211	100.0%	Y	SR-P	
Clematis catesbyana	Coastal Virgin's-bower	999.397	999.383	100.0%		SR-P	
Micropterus coosae	Redeye Bass	36.346	36.276	99.8%		SR	
Mesic pine flatwoods		17.469	17.369	99.4%			
Ptilimnium nodosum	Harperella	0.718	0.700	97.5%	Y	E	E
Ilex collina	Long-stalked Holly	25.142	24.335	96.8%	Y	T	
Shortia galacifolia var. galacifolia	Southern Oconee Bells	346.179	331.138	95.7%		E-SC	FSC
Hexalectris spicata	Crested Coralroot	22.161	21.131	95.4%		SR-P	
Sphagnum subsecundum	Orange Peatmoss	17.509	16.617	94.9%	Y	SR-P	
Lindera melissifolia	Pondberry	12.418	11.704	94.3%	Y	E	E
Platanthera flava var. herbiola	Northern Green Orchid	768.571	723.332	94.1%	Y	SR-P	

E= Endangered; FSC = Federal Special Concern; SR= significantly rare; SR-L=significantly rare limited; SR-T=significantly rare through out; SR-P=significantly rare peripheral; T = Threatened;

* = Is not tracked on lands in the conservation database; Area tracked could otherwise occur on public or private land.

CHAPTER 3 FIGURES

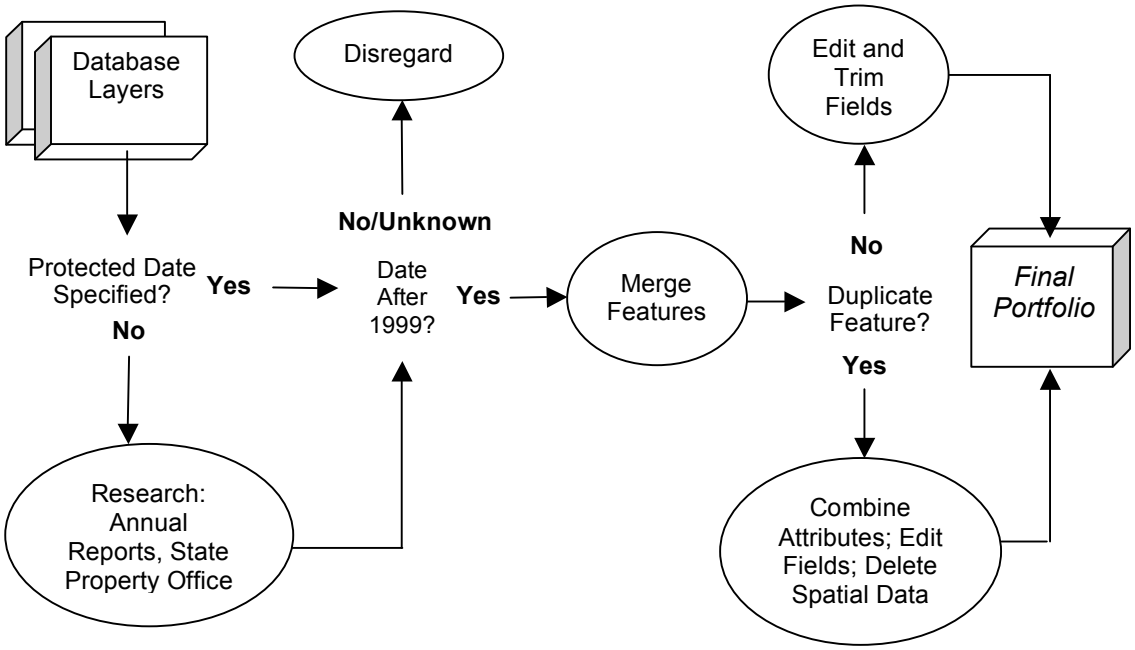


Figure 3.1 Process of creating the final portfolio of lands protected after 1999.

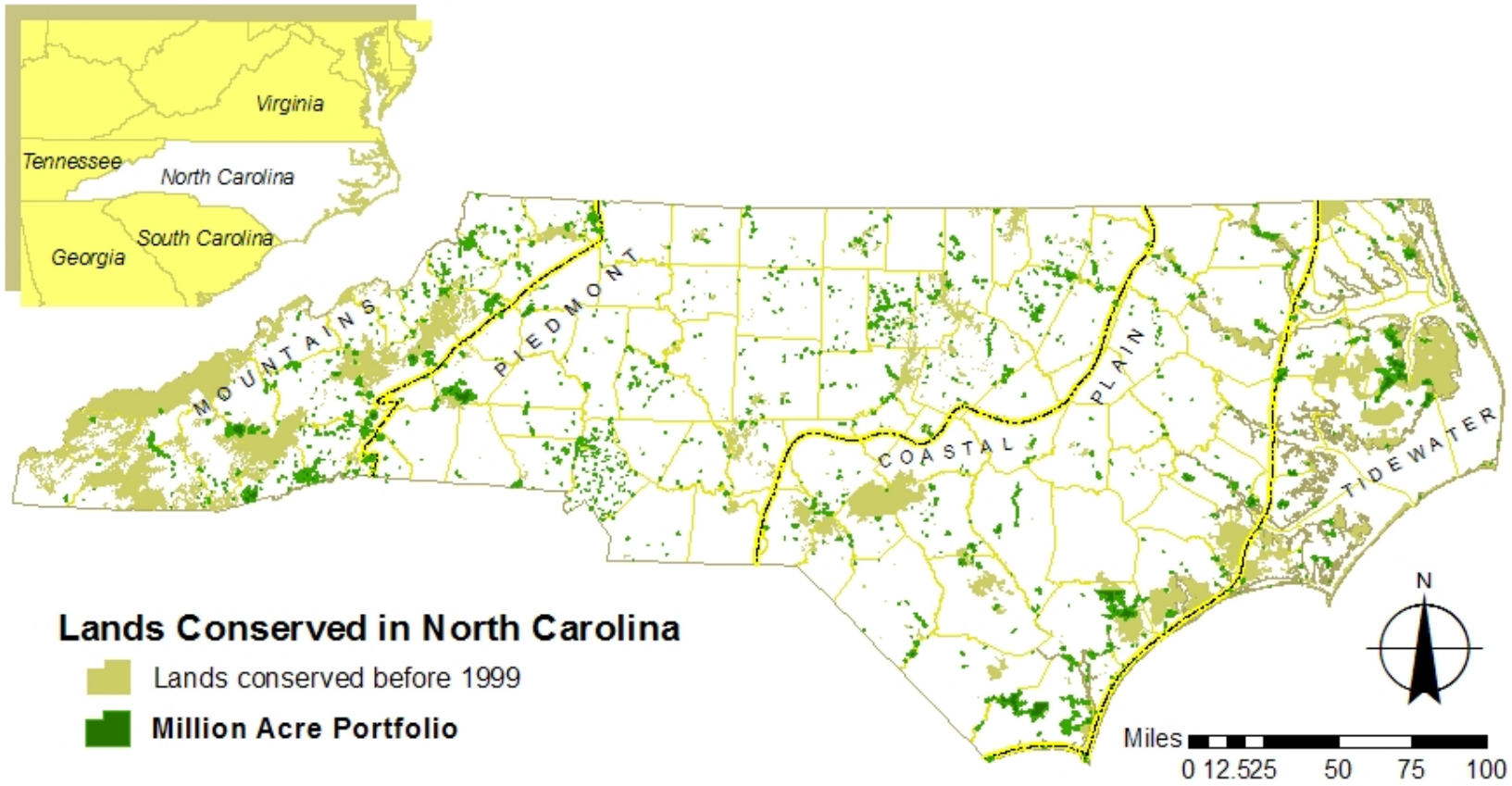


Figure 3.2 Conservation lands in North Carolina. Million Acre Portfolio (lands conserved after 1999) pronounced in dark green; physiographic region divisions are shown in highlighted dash lines; county boundaries are light yellow.

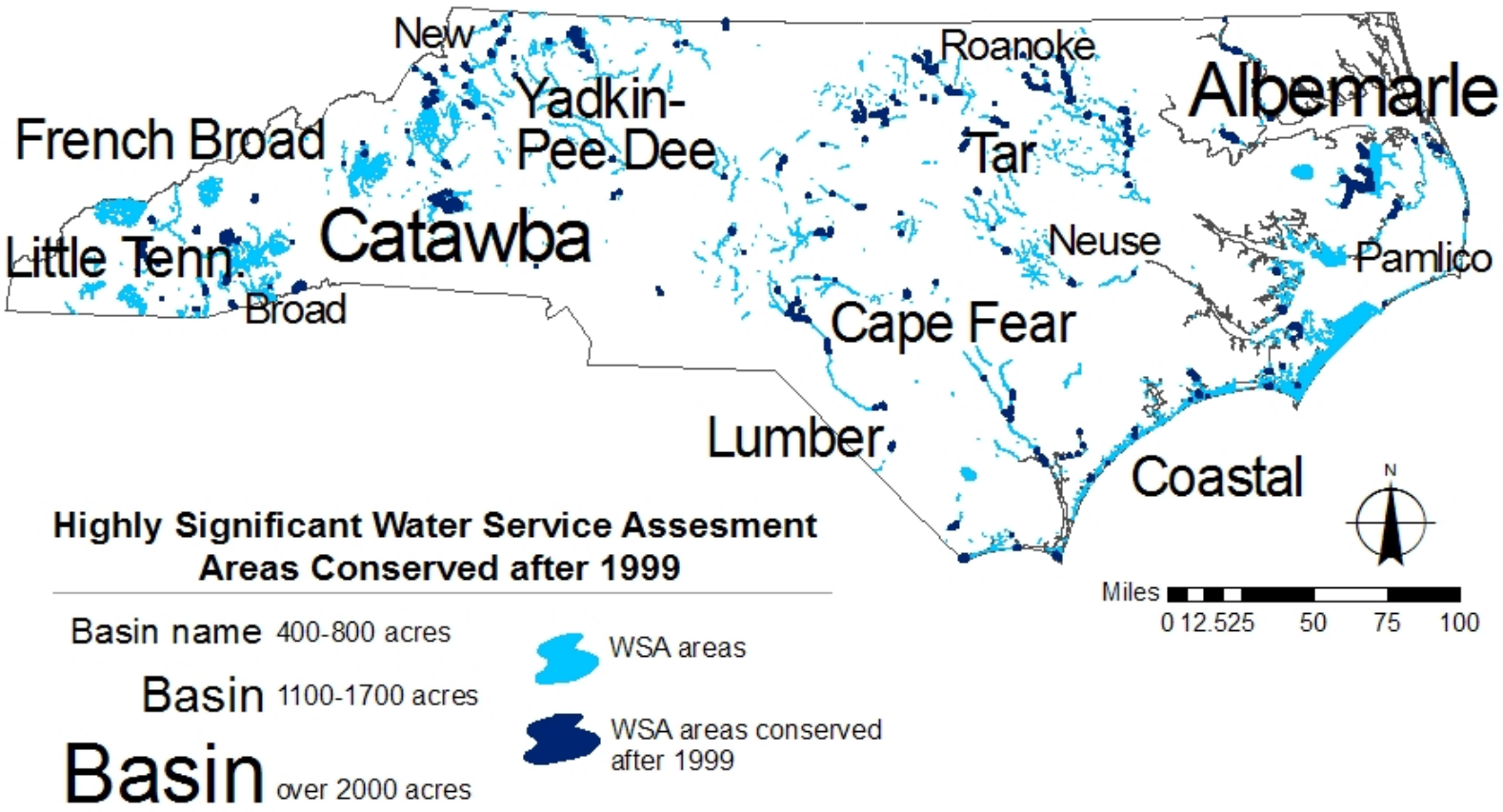


Figure 3.3 The location of WSA areas conserved after 1999; Labels for each WSA basin are sized in proportion to the number of acres conserved there after 1999. Note: to accentuate their locations, the dark blue symbols depicting WSA areas conserved after 1999 are enlarged compared to the WSA areas symbols (light blue).

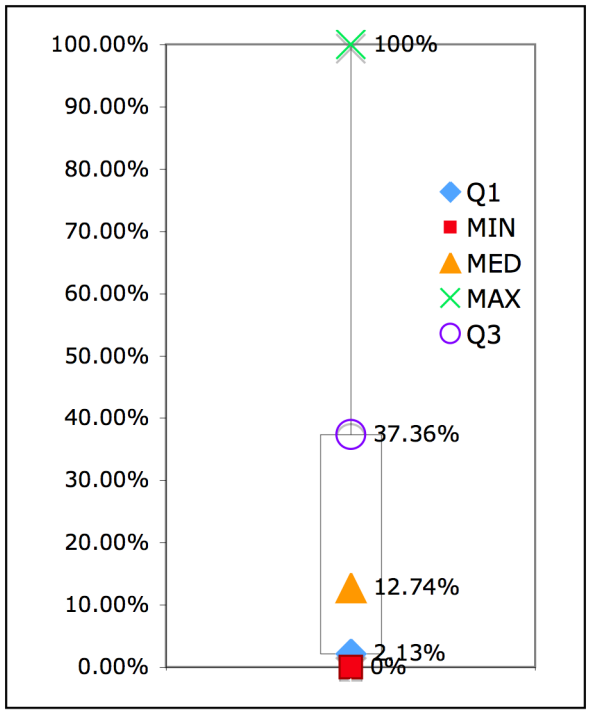


Figure 3.4 Percent of tracked range occurring on lands conserved after 1999 for those elements that are tracked on lands conserved after 1999 (n=330). One quarter of elements (n=82) has < 2.13% of population on post-1999 lands; one quarter has >37.36%.

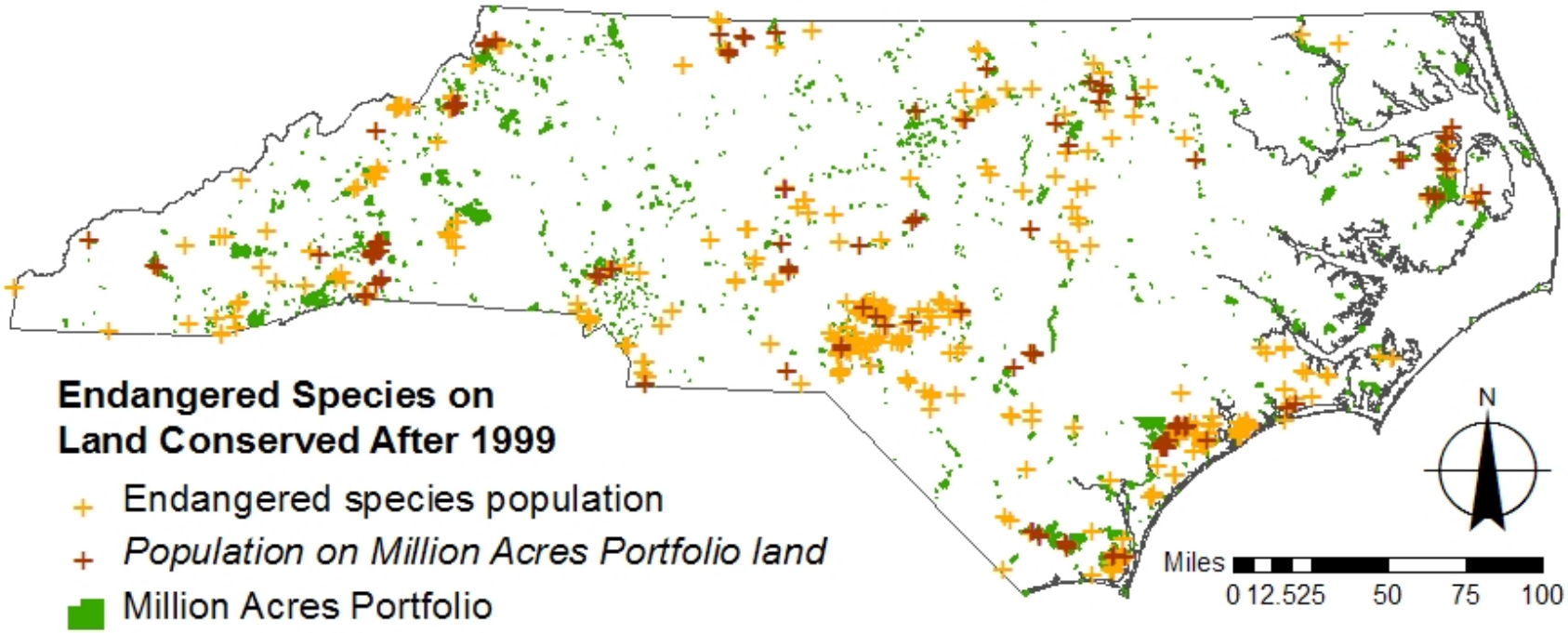


Figure 3.5 NCNHP tracked endangered species populations; population tracked on portfolio land is shown with dark red symbol.

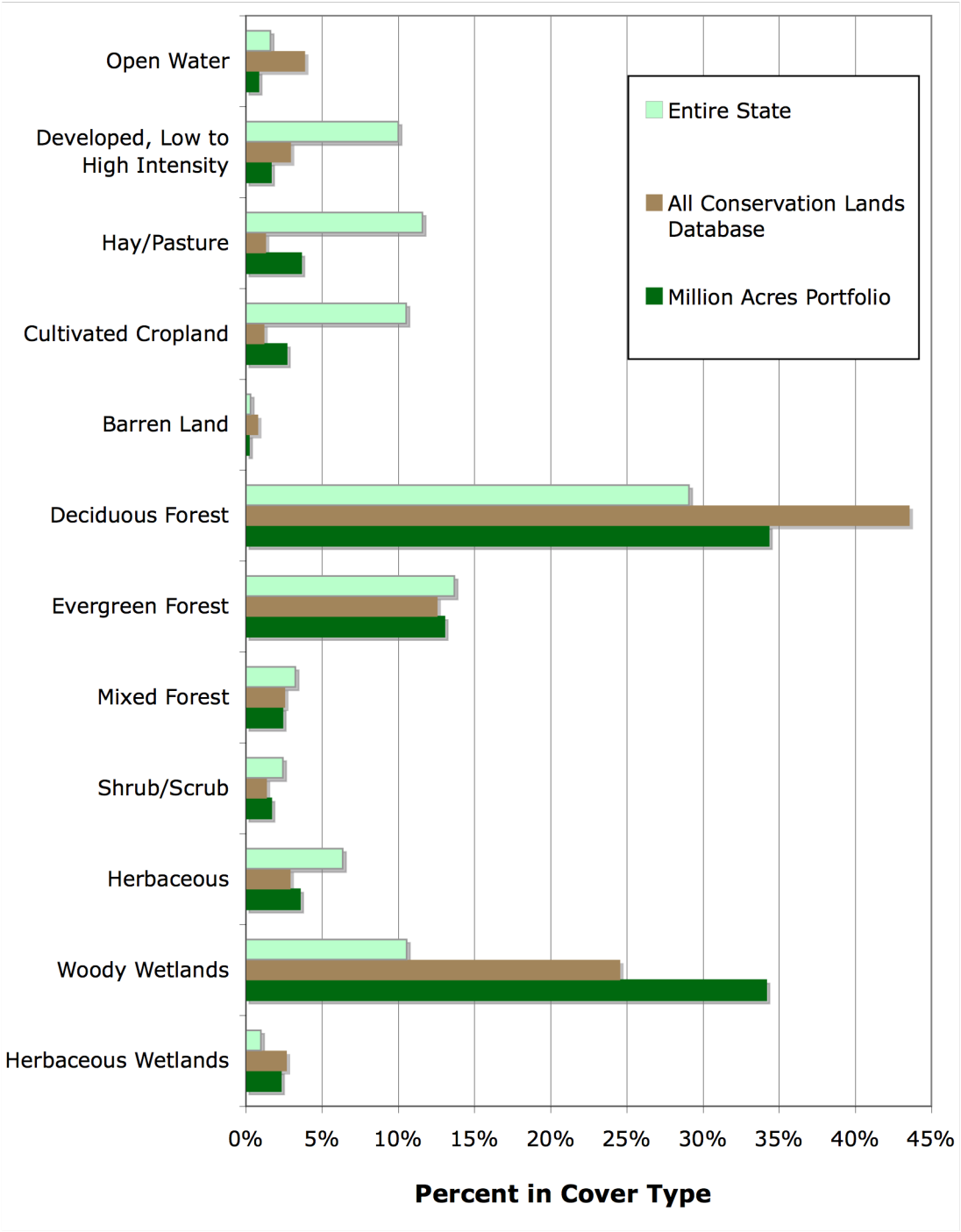


Figure 3.6 Percentage of National Land Classification Data Cover Types.

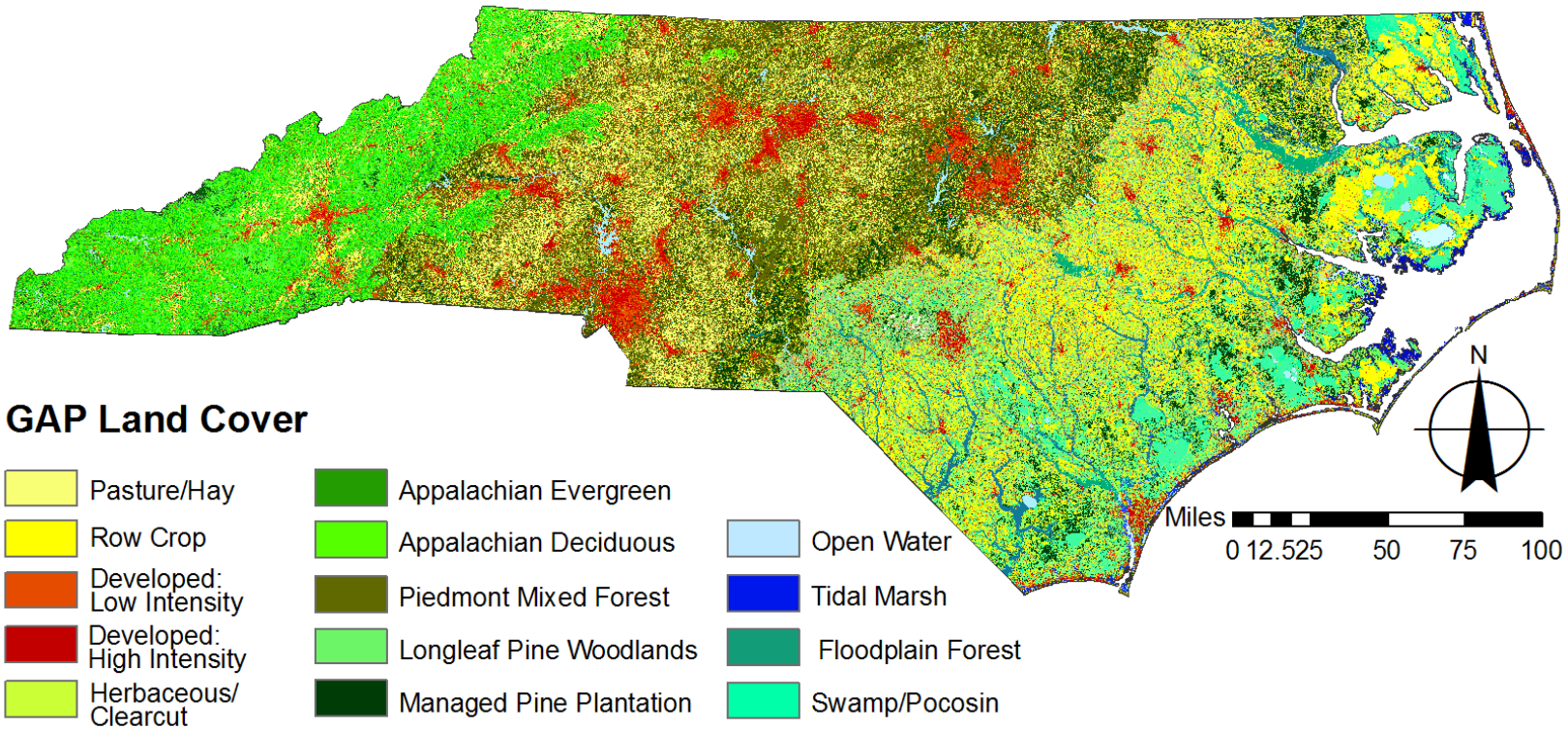


Figure 3.7 Gap Land Classification cover for North Carolina

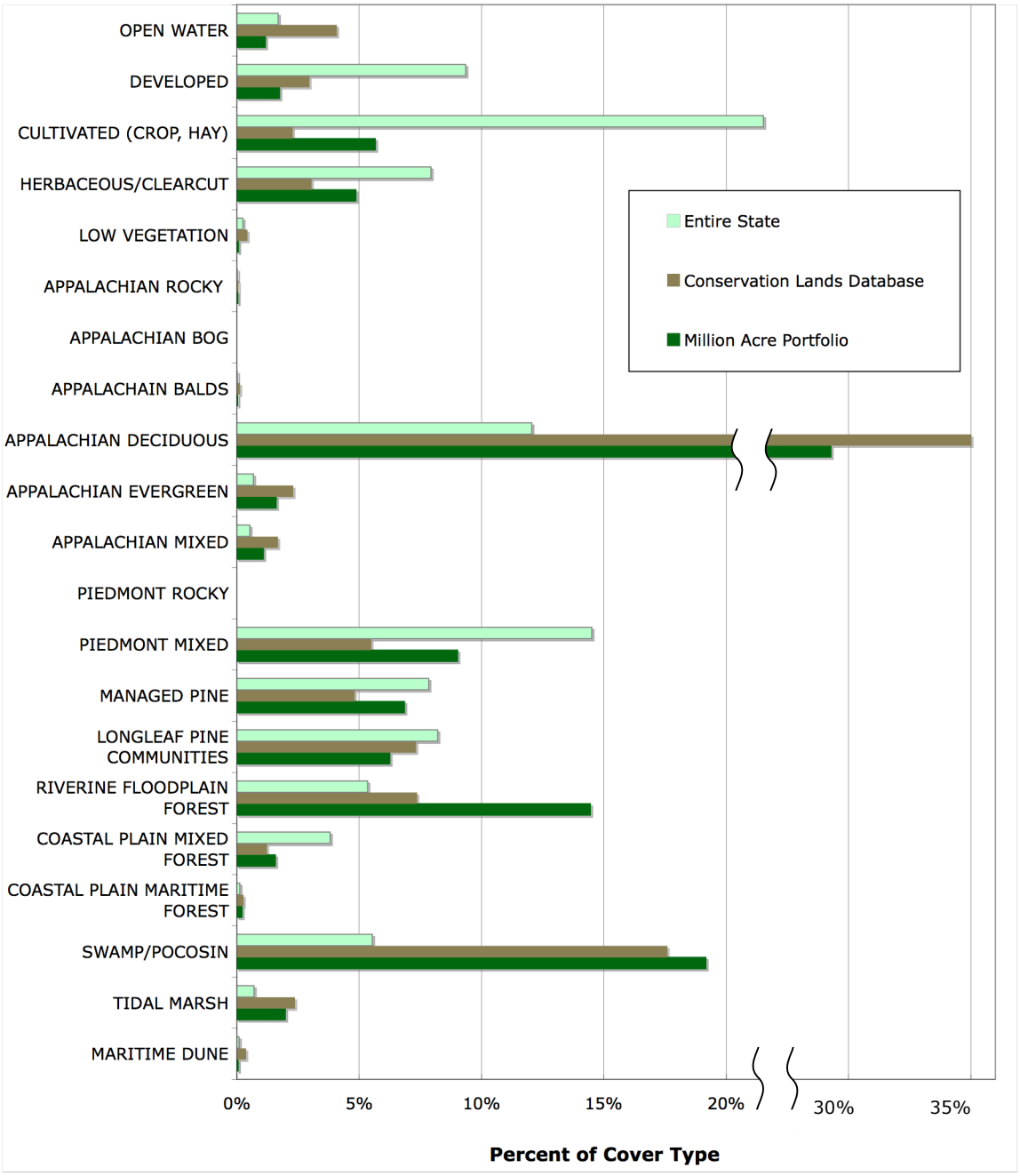


Figure 3.8 Percentage of Gap Land Classification cover types.

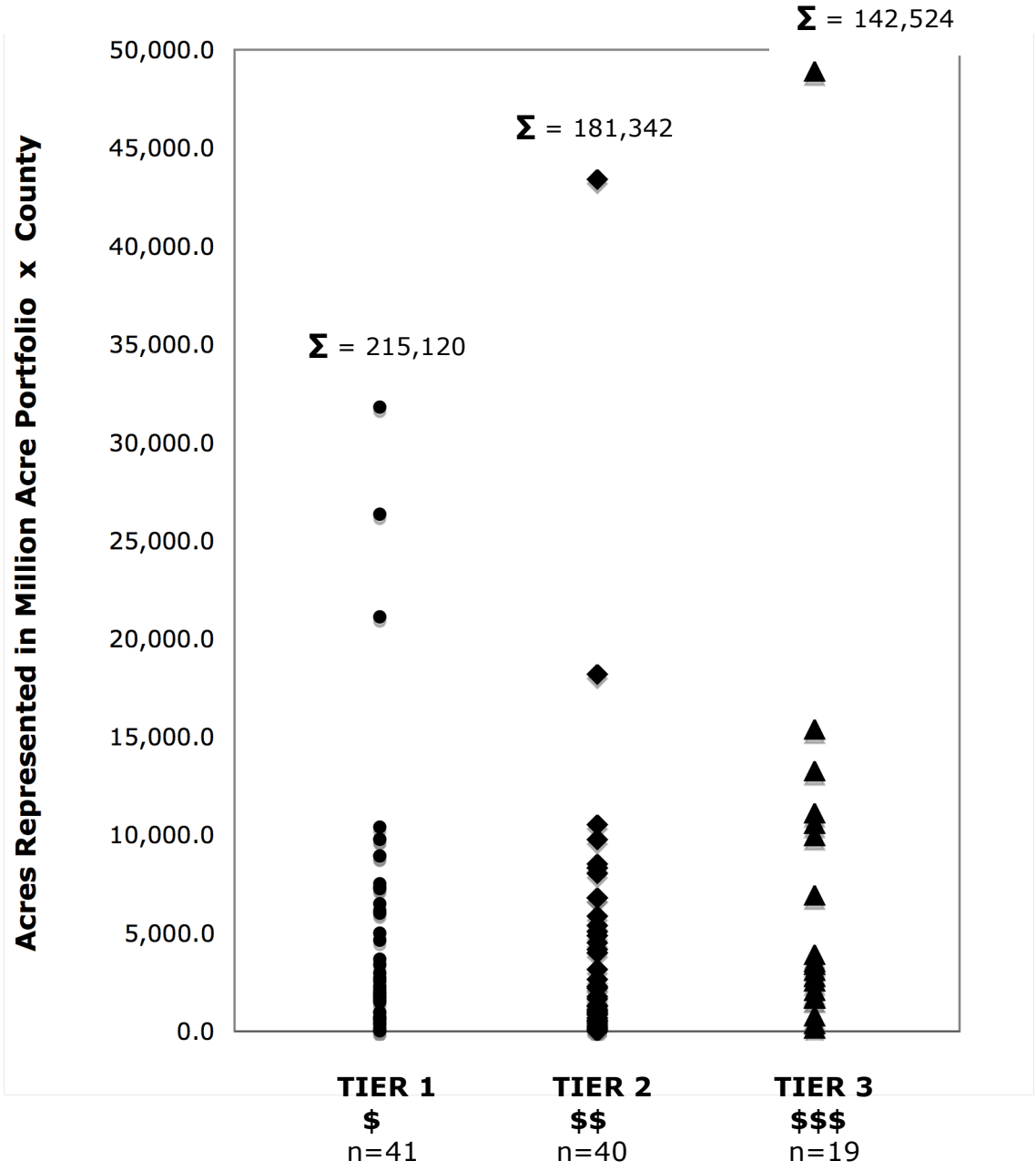


Figure 3.9 Acres conserved after 1999 per county per Tier Designation.

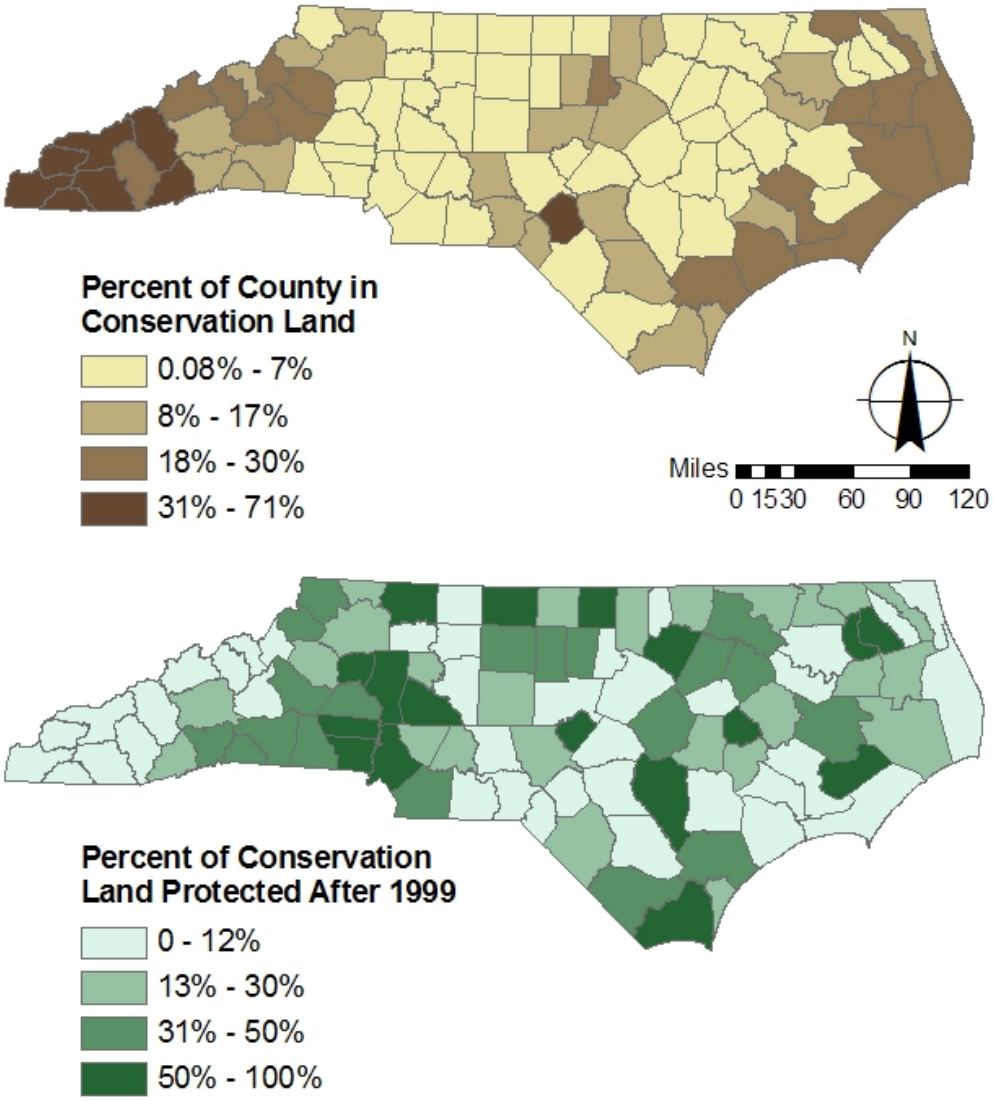


Figure 3.10 Conservation land per County.

CHAPTER 4. Perspectives from North Carolina Conservation Practitioners

4.1 Introduction

Qualitative research methods can contribute much to how we understand land conservation to be carried out by institutions, including how policy affects institutions and in turn affects conservation practice. Mascia et al. (2003) have called for integration of the social sciences into conservation biology research, and the insistence of Adger et al. (2003) on a "thick" analysis of environmental decision-making (analysis of the economic, social and environmental consequences that recognize the "heterogeneity of institutional contexts"), show that there is a death of qualitative (particularly interview-based) research on conservation decision-making. Compared to interview work and participant-observation, survey-based research accounts for a great deal more of the social science infused land conservation literature. For example, in the land trust practices realm, survey-based research aimed at best practices has addressed the motivations behind easements design within the Nature Conservancy (Rissman et al. 2007) and legal defense and enforcement on land trust easement properties (Rissman and Butsic 2011).

For some authors writing about the resource conservation process (e.g. Yaffee 1994; Villanueva 1996), interviews or personal insider experience are incorporated into their work without directly demonstrating a methodology for data collection and analysis. The downside of this approach is that it makes it impossible to assess what particular conclusions

were influenced by the authors' or the respondent's experiences, primary documents, and secondary literature, and how each research avenue empirically contributed to the overall conclusions. This is in contrast to other researchers, whose lead I follow in my research, that develop theory openly and systematically. For example, in the federal agency land management realm, Ginger (1995; 1998) uses participant-observation, interviews, and documents to show how the Bureau of Land Management implemented the Wilderness Act. She writes her interest was not only the end result, but also the process of implementation, and shows how the agency did not act singularly, but underwent much internal conflict.

This chapter presents analysis of interviews conducted with 39 North Carolina land conservation professionals about land conservation before and during the period in which the Million Acre Initiative was in effect. I show that the field has experienced dramatic institutional changes over the past 10 years, namely increased state funding, professionalization, and partnerships, that have steered what lands have been conserved. Despite the development of the institutions involved, the process of conserving land remains subject to the unpredictable opportunities. Thus, respondents describe their work as being necessarily opportunistic. However, opportunities are not isolated from institutions. Institutional changes have affected the amount of funding available and have in turn encouraged certain kinds of acquisitions. Simultaneously, as the private sector has increased capacity and partnerships have become more collaborative, their ability to attract and vet opportunity has evolved.

In this chapter, first follows a description of my qualitative methods (section 4.2) and composition of the respondents (section 4.3). I then discuss two themes, institutional changes

and opportunity (sections 4.4 and 4.5 respectively) and conclude with discussion on how the themes relate to one another and to the Million Acre Initiative (section 4.6).

4.2 Methods

Respondent Selection

Respondents were initially identified from a list of institutions that have participated in the Million Acre Initiative by reporting land acquisitions to NCDENR since 1999; this list marked them as institutions active in land conservation.[14] This selection of respondents was expanded to include affiliates of the state conservation trust funds that fund land acquisition and thus directly shape what gets conserved in NC.

Professionals were selected from institutions three ways: (1) those in leadership positions, reasoning they would have had a longer time in the conservation field and a broader perspective on the workings of their institution; (2) those whose title suggested "land protection director" or "conservation planner" because they would have first-order contact with landowners and funding; (3) those with similar experience and background recommended by other respondents during an interview. To select initial contacts of state trust funds I attended trust fund meetings and contacted those who showed an active role. For geographic balance I did target respondents from institutions across the state. I did not discriminate respondents based on their tenure in North Carolina, i.e. whether or not they had experienced the passing of the Million Acre Initiative.

While researching institutions to contact I soon found that there are hundreds of professionals actively engaged in land conservation across the state in some capacity: legal

[14]Institutional Review Board #09-1070 approved for the period June 11, 2009 through April 25, 2011.

advisors, ecologists, real estate specialists, accountants, administrators, fundraisers, lobbyists, foresters, agronomists, technical specialists, etc. The list broadens even further in the case of private organizations where, in addition to paid professional staff, each has a board comprised of a dozen or so people who, in many cases, assess and give final verdict on land acquisitions. In face of this wealth of expertise to draw from, the number of interviews had to be limited in order to keep the project manageable. Taking the example from other Masters Degree theses and the counsel of advisors, the number of interviews was capped at 30-40.[15]

Interview Protocol

Respondents were first contacted by email with a short explanation of the project, asking if I could telephone them to discuss further. If no response was received, I usually emailed three times before ceasing contact. During the telephone portion I discussed the project, answered questions, and set up an interview time.

Interview protocol was qualitative and open ended, designed to be one hour in length. A set list of topics was constant among all respondents, but specific questions were tailored to the respondent's expertise and the respondent's affiliation. As seen from the sample protocol (Table 4.1) the topics were focused on the process of conservation in North Carolina in recent years. I asked pointedly about the Million Acre Initiative's resonance as segue into broader questions about the role of institutions. I directly asked about opportunism and how opportunities balanced with planning. Field interviews were audio-recorded and later transcribed. Telephone interviews were transcribed in the moment.

[15]Caplow (prospective PhD UNC Ecology), MSc. Central European University in Budapest (32 interviews); Ashton, MP. UNC City and Regional Planning 2006 (25 interviews); Matthews, MA. UNC Sociology 2010 (28 interviews); D'Anna, PhD UNC Ecology 2010.

Table 4.1 Sample interviewing protocol; follow up questions were asked when respondents did not answer with sufficient detail, or when the question was relevant to a respondent's position.

Main Topic Questions	Possible follow up questions	Motivation for Topic
Ask about respondent's background and how he or she came to be with affiliation.	*What are his or her duties? What's a typical day?*	Introductions and "ice breaker"; learn more about respondent's role and experience.
Does the Million Acre Initiative come up today in his or her work? What role has MAI played?	*What has motivated conservation in the past 10-15 years? What should the role of the state be?*	Effect of Million Acre Initiative; How has conservation changed over time.
What needs to change to have effective conservation in the future 10-15 years?		How has conservation changed over time; respondent's future ideals.
What is conservation planning? How does it factor into his or her institution's work?	*Does he or she use the CPT?*	Role of planning in institutions.
How do planning and opportunity balance; what is "opportunism"?	*What is special about working in respondent's region?*	Reactions to opportunistic conservation.

My method of analyzing transcript data (as well as my whole data gathering process, including designing interview questions) is informed by Weiss (1994), Lofland (2006), and Corbin and Strauss (2008). To begin analysis, transcript data were coded with Atlas.ti 5.0; coding is an iterative method of systematically reading data and ascribing themes as they emerge to distinct parts of data; themes are related and linked and built into larger concepts and larger theory. While coding I was open to unexpected themes that emerged from the data, and I also sought out specific responses on certain themes (e.g. the role of opportunism; The Million Acre Initiative).

4.3 Composition of Final Respondents

Fifty-two professionals were contacted before a total of 39 respondents agreed to be interviewed, and I ceased contacting more respondents. Interviews were conducted July 2009 through June 2010; the majority of interviews occurred between August and November of 2009. Thirty-three interviews were one-on-one and one interview was held with six respondents, making a total of 34 interview events. Thirty events were in person; 25 interviews were at the respondent's home or place of work, and five were in a public location. The remaining four interviews were conducted over the phone.

The majority of respondents, 61%, are affiliated with a private organization, either a land conservancy or a lobbying organization, or an organization that engages in both. State employees were either from Natural Heritage Program or Wildlife Resources Commission (Table 4.2). I interviewed trust fund affiliates from CWMTF, NHTF, and PARTF. Municipal respondents were employees in municipal Open Space Programs, usually housed within a Parks and Recreation department. The largest group of respondents, 17 individuals, works state-wide (Fig 4.1). Three interview events were with respondents who work in the mountain region. Ten respondents work in the Piedmont region in either a single-county or multiple-county territory. Two respondents' territories extend over the coastal plain. Two respondents work in the outer coastal plain tidewater region.

I have captured perspectives from some of the main conservation institutions that are now actively acquiring the most acres through out the state. I also incorporate perspectives from smaller, very active, local groups who are transforming their local landscape through acquisition and advocacy. I thus have achieved a sense of the institutional processes through which land is conserved and how these institutions have changed during the Initiative.

Table 4.2 Professional Affiliations of Respondents

Affiliation	Number of individual respondents
Inter/National Private w/ NC Chapter	4
Regional/Local Private	20
State Agency (NHP, WRC)	6
State Trust Fund (CWMTF, NHTF, PARTF)	6
Municipal Open Space Program	3
Total respondents	39

NHP = Natural Heritage Program; **WRC** = Wildlife Resources Commission; **CWMTF** = Clean Water Management Trust Fund; **NHTF**= Natural Heritage Trust Fund; **PARTF** = Parks and Recreation Trust Fund.

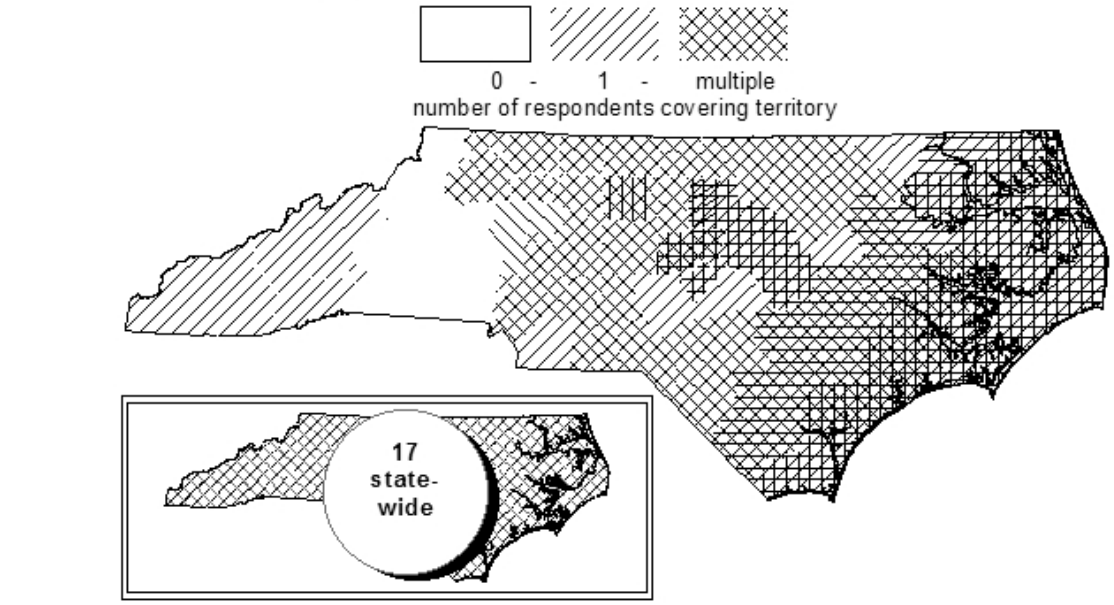


Fig. 4.1 The professional territory of each respondent (with exception, the group interview with 6 respondents is only shown as one respondent here). Darker shading represents more respondents covering that region, and 17 respondents have territories that extend over the entire state.

4.4 Theme: Institutional Change

The Million Acre Initiative, seen in light of resulting events, signaled a shift in the state's approach to conservation, and respondents from all sectors emphasized how much the land conservation had changed over the past decade. However, what most respondents pinpoint as the linchpin of change is not the Initiative itself. Respondents discussed other institutional changes that heavily influenced conservation, namely three institutional changes that have heightened over the past decade and shaped contemporary conservation in North Carolina: (1) increases in state funding, particularly the Clean Water Management Trust Fund; (2) increasing professionalization of the private conservation community, which has emerged in response to increasing (internal and external) pressures for legal, financial, and technical accountability; and (3) the development of multi-stakeholder collaborative partnerships that have strengthened community relationships, increased efficiency of land acquisition and stewardship, and leveraged funding from inside and outside the state.

4.4.1 State Funding

The following narrative was prompted by a question that asked what forces caused an increase in land conservation over time. It illustrates how respondents distinguish the revolutionary importance of post-1990 funding sources.

"The exponential increase in conservation land [over time] is *directly a result of funding*. The funding exploded in response to land prices, so the land boom increased the [dedicated real estate tax] revenue for the trust funds… I think the Parks and Recreation Trust Fund [PARTF] was [established in] 1995…. Suddenly you went from this pot of money to three times, four times as big when you added PARTF, and that, again, is funded primarily from the real estate deed stamp revenues….Then Clean Water Management Trust Fund came on board [in 1996] and always a significant portion of their funding went to land conservation. So *it was the rapid growth in funding for those three sources* [including Natural Heritage Trust Fund (NHTF)] and then we added more recently the Agriculture Trust Fund [in 2005]. The other piece that played a role was the Ecosystem Enhancement Program with their preservation component [established in 2003]." [14, my italics][16]

[16]Most respondents gave me permission to disclose their name and/or employer. However in most places I have chosen to leave quotes anonymous. Quotes are attributed to randomly numbered interview events, #1 through #34.

As new state funding mechanisms for conservation multiplied, the amount of funding dollars available increased, and the types of projects that could be funded diversified. The main avenue through which the NC state government funds conservation is the four trust funds mentioned by the quote above. The North Carolina General Assembly established these trust funds at different points in time, for different conservation purposes.[17] The respondent also highlights forces that influence trust fund funding depending on how a trust fund is designed: external forces, i.e. real estate market boom and busts, and internal government forces, i.e. the legislature establishing new policies.

Agriculture Development and Farmland Protection Trust Fund (ADFP)

The Farmland Preservation Trust Fund was established in 1986, but was developed into the Agricultural Development and Farmland Preservation Trust Fund in 2005. ADFP funds perpetual and term farmland easements, the establishment of Voluntary Agriculture Districts or county farm plans, and other community-focused projects that will "benefit the agricultural community as a whole" (ADFP 2010).[18] Although ADFP receives the least funding of the trust funds (Fig. 4.2), according to the Annual Report on 2008-2009 funding cycle, all grants were matched by either a local government, a philanthropic organization, the federal government (e.g. USDA-NRCS), a land trust or other non-profit, showing the ability for ADFP applicants to leverage funds from a wide-range of sources. Further support for

[17]CWMTF: Chapter 113 Article 13A; NHTF: Article 5A; PARTF: Article 2C; ADFPTF: Chapter 106, Article 61.

[18]As example of community-focused projects, two projects that were funded in 2009, a livestock marketing center in western NC and a grant for publishing a magazine for the Appalachian Sustainable Agriculture Project.

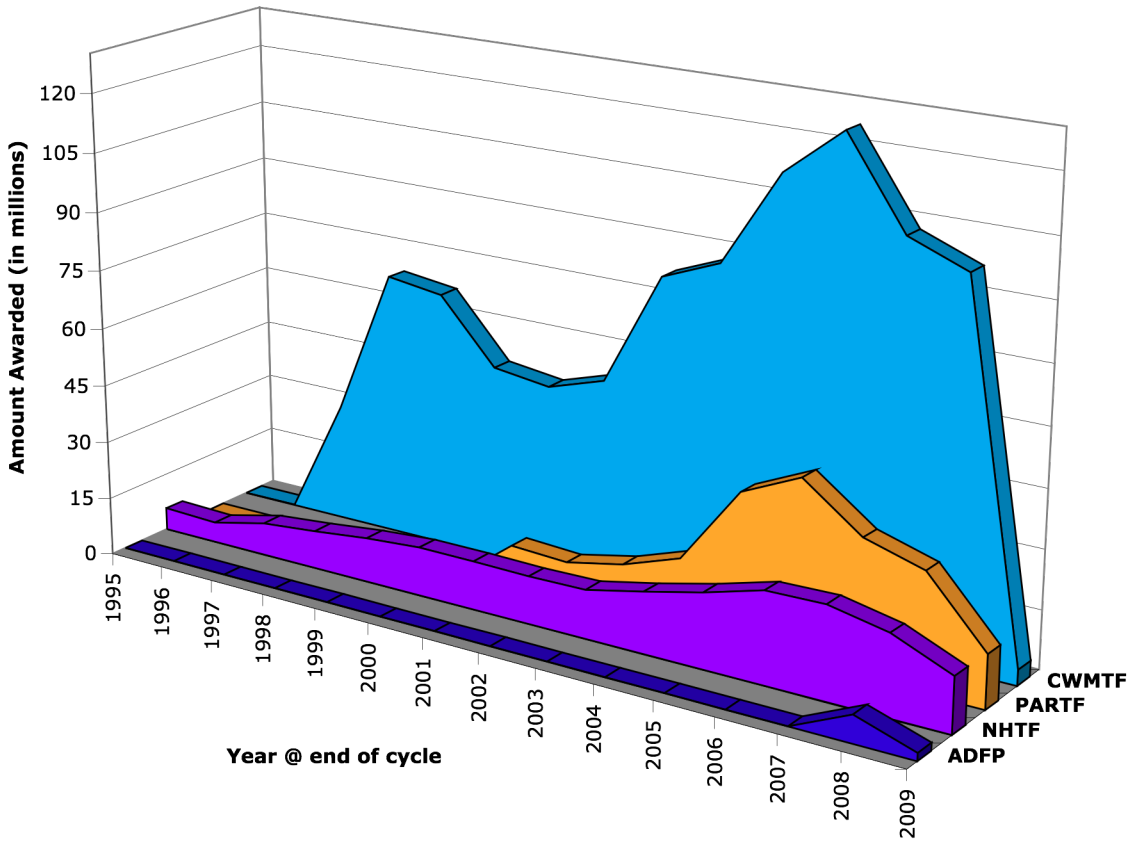


Fig. 4.2. Funding levels for the four trust funds since 1995.

farmland conservation is shown by the amount of applicants ADFP received in the 2009-2010 funding cycle: 70 applications from 55 counties, requesting $15.7 million in grants (ADFP reports this represents $49.1 million in project value when the matching amount is taken into consideration), with only $4 million for the ADFP to award.

Natural Heritage Trust Fund (NHTF)

NHTF, established in 1987, funds the Natural Heritage Program's biological inventories and provides funding for state agencies to acquire places of natural and cultural heritage importance. A few examples of parks and reserves that NHTF have contributed

funding to are Grandfather Mountain, Chimney Rock, Kitty Hawk Woods, Sandhills Game Land, and several NCDACS Plant Conservation Preserves. NHTF and PARTF are the only two trust funds with dedicated funding sources outside the appropriations process. According to their website, NHTF receives an approximate annual $12 million, from a portion of the state's real estate transfer taxes and personalized license plate fees. In 2004, 2007, and 2008, NHTF was authorized by the General Assembly to receive Certificates of Participation bonds, significantly increasing their award amount in those years. Since 1987, NHTF has awarded $300 million to protect 286,539 acres. Some of these acres have been protected in partnership with the other trust funds (NHTF 2009).

Parks and Recreation Trust Fund (PARTF)

PARTF, founded in 1994, is devoted to funding the establishment and maintenance of recreational areas. The majority of PARTF's awards, 65%, are dedicated to the state Division of Parks and Recreation, 30% is mandated for local government dollar-for-dollar matching grants, and 5% is awarded to the Coastal and Estuarine Water Access Program (NCDPR 2010). The matching grants means that PARTF is able to leverage funding and support from local governments. PARTF receives its dedicated funds from the state real estate transfer tax; awards increased in the mid-2000's when they were authorized the use of Certificate of Participation bonds (Fig. 4.2).

Clean Water Management Trust Fund (CWMTF)

Although all trust funds play their own unique role and have contributed (hundreds of) millions of dollars towards land conservation, many respondents considered CWMTF to

be especially revolutionary. The following quotes from two land trust professionals and one state professional exemplify this:

"In 1996, *the most incredible thing* that occurred was the state created the NC CWMTF and I guarantee that if you talk to anyone who was doing this work before 1996, *that was a real game changer."* [3, my italics]

"Within the land trust community, *the bulk of those* [conserved] *acres* have been, in part at least, funded by the Clean Water Management Trust Fund." [12, my italics]

"The bottom line is, if it wasn't for Clean Water [CWMTF] and Heritage [NHTF], *land conservation in this state would be no where near where we are*. I mean Clean Water and Heritage has been really, really what's gotten our state where we are." [6, my italics]

CWMTF was established to protect water quality by providing funding for stream restoration, wastewater and stormwater innovations, and land acquisition. Established in 1996, it is authorized to award grants to private organizations, local governments and state agencies. CWMTF and ADFP receive appropriations from the state budget and are therefore affected by the annual appropriations process (CWMTF also receives monies from "Scenic River" license plates). Unlike ADFP, CWMTF is the lone trust fund with a legislative funding mandate: "The General Assembly finds that, due to the critical need in this State to clean up pollution…it is imperative that the State provide a minimum of one hundred million dollars ($100,000,000) each calendar year." (113A-253.1)

CWMTF is not consistently appropriated its mandated $100 million. The history of the trust fund's success conveys how one political appointee's push can influence funding, in this case, the work of Senator Marc Basnight. In a March 2002 Wildlife NC interview, Senator Basnight is quoted about his role in shaping CWMTF, "[Before 1996] there was little to nothing in the way of securing funding for the ongoing preservation of open space. I believed that we needed a guaranteed source of funding dedicated specifically to cleaning up

our waters and to preserving sensitive areas." Senator Basnight was a lead author and sponsor of the CWMTF legislation, and continued to advocate for its success:

"*Everybody* says this [CWMTF reaching a $100 million annual appropriation level] is because of Senator Basnight, because it is his legacy, his creation and *he [wanted] to see it go there*." [29, my italics]

CWMTF changed the size and scope of land conservation in NC. It increased the size of the price tag that could be considered by conservation institutions, and also increased the size of tracts that could be funded, mirroring the conservation movement's emphasis on "landscape-scale" conservation. In the words of one respondent:

"The idea that you could spend multiple million dollars and actually fund a land deal, that was--wow. We started looking at two, three, five thousand acre blocks. It didn't take too long for the demand to exceed the funding sources and it really did change the way we thought about how to do conservation." [14]

Furthermore, the scope of CWMTF's mission was broad. The Director of the CWMTF quoted that, "despite challenges, CWMTF has done extensive work…the trust fund has [worked] in 98 counties [out of 100 total], meaning there are communities all over the state who can give tangible support to funding the trust fund." The breadth of projects CWMTF funds is one reason that it has worked so extensively through out the state. In addition to land acquisition, their mission extends to stormwater and wastewater innovations and aquatic restoration.

Many land trusts took advantage of CWMTF's funds for watershed and riparian corridor planning to draw up land acquisition and management plans for their respective regions. This planning, in turn, was viewed favorably by funding organizations when organizations could subsequently show that land acquisition projects had been identified by a formal planning process:

“It brought resources to bear that didn't exist before, that didn't exist in any form, not even at a low level, it just wasn't there, [including] both money as well as technology to some degree, because the CWMTF funded that kind of [conservation and watershed] planning.” [3]

According to the former executive director of CWMTF, the trust fund has affected priorities that were set by land trusts, effectively causing more water-related land conservation to occur:

"CWMTF is by far the largest funder, and I'm sure that's changed priorities for land trusts and others. I would say that it's a good thing! Clean water is one of the most pressing environmental issues facing the state."

Some respondents pointed out that their institutions’ commitments to water resource protection existed before CWMTF, but more funding meant, as one respondent put it, “amplification” of projects with a water resources focus [3]. Some respondents reflected that CWMTF has influenced priorities for some land trusts so much that effectively the only projects these trusts were pursuing were ones that could get CWMTF funding.

"Because of the majority of our funding has come from Clean Water that has definitely been our major focus, watershed protection." [15]

"Those funding entities have certainly influenced the priorities [of land trusts]. So there may be 'at our heart, this is what we're about' but what projects have we done in the last year and why were those projects done...?" [7]

Recession shock

When Governor Purdue announced that 2009 budget cuts would mean no appropriation for CWMTF and ADFP, and perhaps restriction of bonds and tax revenue for NHTF, shock that resonated through the conservation community (see Land for Tomorrow Action Alert emails in Appendix F). This is further evidence that the state has become a reliable and major funding source, and it echoed the following excerpt from Endicott: “freed of the burden of finding all the money themselves [thanks to public funding programs],

nonprofit organizations have been able to accomplish more than they might ever have believed possible. *For most of them, there is no going back: cooperation with government is no longer an occasional diversion…it is a necessity*" (1993, p. 7, my italics).

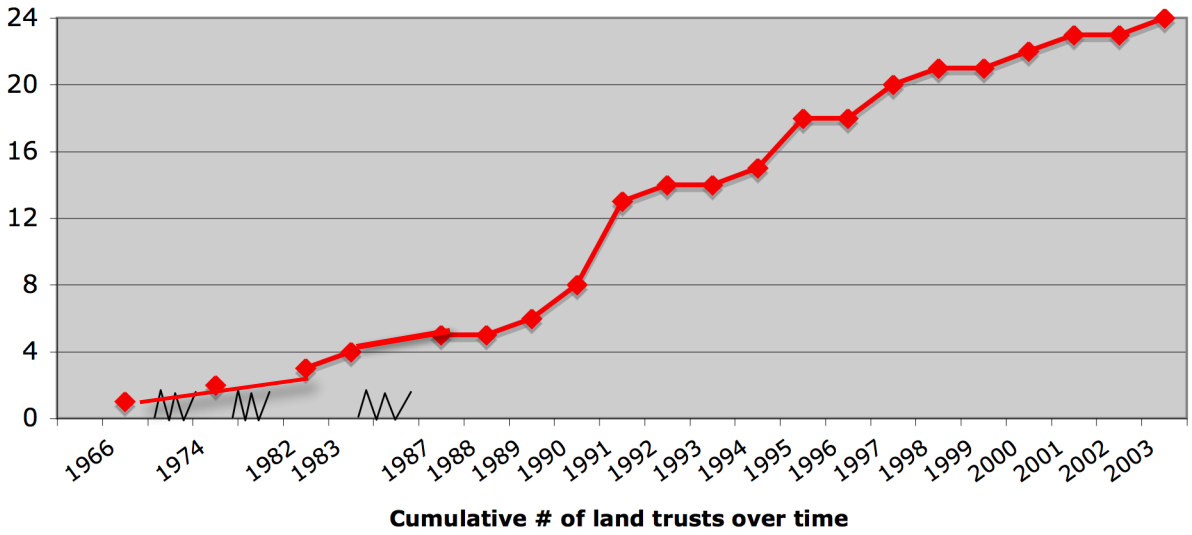
After a lobbying campaign, a letter from the military, and meetings between the Governor and the conservation community, CMWTF ended up with $50 million and ADFP was appropriated $1.5 million (see Appendix F).

4.4.2 Professionalization

Respondents also discussed developments in the nonprofit conservation sector: an increase in the number of organizations, and an evolving professionalization of the conservation field, which emerged in response to increasing (internal and external) pressures for legal, financial, and technical accountability.

Land trust growth

The 1990's has been called the "decade of destiny" for land trusts because of the number of them that were established during this time (Qtd in Brewer 2003, p. 182). According to Brewer, "the post-1980 boom in land trusts was fueled by the realization that the government had not just abdicated leadership in the conservation wars but had defected to the enemy army" (2003, p. 37). The Reagan conservative era nearly vaporized all federal grant money, and states and private organizations stepped up to fill the void. The Land Trust Alliance, an umbrella organization devoted to land trust support, was established and provided resources for people interested in forming new land trusts. The result was a positive feedback in the number of organizations devoted to conservation land.



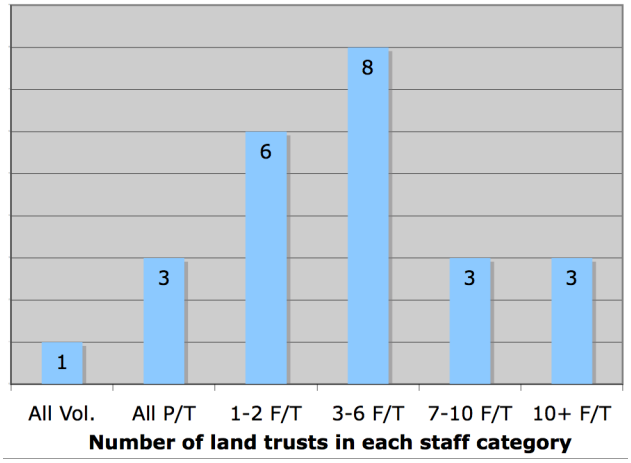


Figure 4.3
a. (above) Number of NC land trusts established over time; As of 2010 there are 24 land trusts operating in the state.
b. (left) Staffing capacity of NC land trusts; 16% rely on all volunteer or all part-time staff; 33% have between 3 and 6 full time staff.

Today, all 100 counties in NC have at least one land trust working in their territories, although the concentration of land trusts is regionally skewed towards the mountains and piedmont (one trust covers the 32 outer coastal plain/tidewater counties). As of 2003, NC had more land trusts than any other state in the southeast (Brewer 2003), and the Land Trust Alliance reported in 2005 that NC land trusts had protected more acres compared to the land trusts of other states (LTA 2005).

Land trust staff capacity in NC has increased 87% since 2000 (LTA 2005). Staffing capacity ranges from one trust with 14 fulltime staff to one trust with all volunteer staff; a third of NC land trusts employ between 3 and 6 fulltime staff (Fig. 4.3b). Most NC land trusts that employ fulltime staff employ additional part-time staff (CTNC 2010).

"Professionalization"

One accompanying factor of the increase in number of land trusts and land trust employees, was described by one land trust respondent, as "a professionalization of the conservation community":

> "The other thing [that has made this an active time for local land conservation] is what I would describe as a *professionalization* of the conservation community, particularly on the non-profit side, but even on the government side, you just *saw a lot more professionals working for land conservation, than there had been before, bring smarts and sophistication to the table*…the amount of work has increased many fold, and the sophistication, the kinds of projects that we're working on -- I am amazed." [3, my italics]

Professionalization is defined by the above respondent in terms of a more professionally trained and oriented staff bringing "smarts and sophistication" to the field. Based on this interview and other interviews, I take "sophistication", in terms of the quality of projects, to refer to projects that are larger in scale, that perhaps involve several land owners, may require partnerships with other institutions, and require special stewardship. These types of projects have required hiring legal advisors, seasonal ecologists, GIS specialists, etc.

At the same time, the situation can also arise for which professional staff is necessary before projects can be successfully undertaken. In the words of another respondent from the land trust sector: "you encounter the need for a highly qualified professional staff" [21]. "Need" for professional staff has arisen because as conservation work has become more

technically complicated, public accountability has increased. The following quote suggests that professionalization is an important step towards long term stability and accountability:

"For land trusts in general, *this work has gotten more complicated and accountability is critical. It's important to us and other land trusts to have professionalism on their staff*…we are all concerned that we have permanence in our work and *we demand of each other a high level of professionalism*." [21, my italics]

While individual land trusts' constituencies have demanded more accountability in recent years, NC organizations have also felt more keenly the national land trust movement's insistence on increased transparency and documentation and have responded in turn. The Land Trust Alliance has promoted and provided resources for increased accountability and professionalization, including an accreditation certification program that helps land trusts ensure that their policies and programs, "meet the national standards for excellence, uphold the public trust and ensure that conservation efforts are permanent" (LTA 2010).

Seven trusts in North Carolina are accredited with LTA as of October 2010. I interviewed respondents from five of these seven accredited land trusts and accreditation was a salient issue for two respondents since their organizations were actively going through the "rigorous" LTA process at the time of our interviews. These two professionals viewed accreditation as a necessary continuation of professionalization. Accreditation was forward thinking, in that it would help ensure the permanency of the land trusts work. As Brewer writes, "land trusts assume more responsibilities rarely thrust on small organizations", referring to the fact that land trusts take on the task of legal protection and stewardship of properties for *perpetuity*—essentially, for all time (2003, p. 183). The organizations are thus, in turn, trusted by their clients and membership to plan for long-term stability.

4.4.3 Partnerships

Another manifestation of professionalization and increased sophistication in the conservation community has been the formation of innovative partnerships. This is not to suggest that inter-institutional partnerships are new to the conservation field. The Nature Conservancy, which from 1915 until the 1950s had as its foundational objective as a committee of the Ecological Society of America to advise state and federal governments on land acquisitions, is an example of the long history of working connections between institutions (Brewer 2003). Endicott (1993) and Keough and Blana (2006) discuss contemporary partnerships between public and private institutions in acquiring, managing, and restoring land, showing that they come in many forms and are essential to conservation endeavors. Recent work in the coastal plain of NC (Costanza 2010) shows that restoration efforts in longleaf pine landscapes, which involves fire and complicated dealings with landowners, is successful because it is carried out by partnerships.

My respondents talked extensively, and positively, about partnerships, and for them partnerships referred to different kinds of relationships. "Partnership" referred to the working relationship between a landowner and the organization. Partnerships were also contractual agreements between different institutions regarding the process of legally conserving and stewarding a property. There are also respondents from certain regions of the state who are engaged in multi-institutional partnerships formed to establish collaborative goals, coordinate planning efforts, and leverage grant funding. The two latter partnership forms are worth discussing in further detail because they show how partnerships can be both contractual and collaborative. Additionally, the examples showcase how partnerships have increased the resources available to individual institutions and effected what properties become conserved.

Property-Partnerships

Property-Partnerships arise when different institutions work together to legally protect and/or conduct long-term stewardship on one property. Partnering can arise out of financial need. For instance, two county professionals in Open Space programs discussed partnerships created out of a county's need for stewardship personnel and a lack of hiring budget within the county:

"We've known that we need to create a stewardship position, because the more land you amass, your responsibilities for that land, and just with the county's budget situation the last few years [*shakes head*]. So, again, that's where partnerships come in. We're going to work with the Soil and Water Conservation folks to help us in monitoring some of the farmland conservation easements. We've talked to the [local land trust] about perhaps -- they have a stewardship coordinator -- contracting with them to do some of the stewardship responsibilities for us." [23]

In this instance, periodic contracting with land trusts, or working with existing Soil and Water conservation districts would prove more economically feasible for a municipal government. Property-Partnerships can also play a prominent role in conservation during earlier stages of the conservation process, such as in the prioritization of potential conservation projects and in acquiring or otherwise legally protecting properties. The following quote describes a collaboration scenario from the coastal plain, where local land trusts and the Nature Conservancy manage offers from landowners, and eventually approach a state agency to purchase and/or manage the best candidate properties:

"Organizations like TNC and some of the [land trusts] in some instances they actually come…with the idea that if they are a participant in the land acquisition could it then reside with the Wildlife Commission in the game lands program...that's because we [at the NCWRC] have the infrastructure to deal with it properly. We have wildlife management crews that can post the boundaries. We can maintain and manage the roads. We can manage the habitats for various wildlife objectives...so it's always a collaboration. It's either the [NCWRC] and a Trust Fund and a land trust, or TNC, or The Conservation Fund, all kinds of different potential partners, and it's always a collaboration." [10]

In these situations, properties that would either require management that is too extensive for land trusts, are transferred to state agencies that have proper "infrastructure" to manage it for ecosystem integrity, as well as recreational objectives. Why do landowners not

simply work directly with the state in these instances? Respondents from land trusts and state agencies had many experiences with landowners who would prefer to work with land trusts rather than a governmental agency. The government carries a stigma of inflexibility, and its reputation is that contracts are prolonged over a long time period.

Project-Partnerships can move beyond a single property contract into a long-term collaboration. As suggested by the above quote, mutual trust has developed between different institutions so that inter-institutional relationships lead to collaboration on multiple projects. Respondents spoke about how institutions stay in communication with each other about the work they are conducting. The institutions have knowledge about each other's strengths and abilities. As the quotes below indicate, their work becomes cooperative so that the best outcomes can be achieved for everyone involved:

"Because we're trying to work in cooperation, in unison, we each know what the other can do in a given situation." [1]

"Sometimes you'll get landowners that will try to contact different groups. 'What about this? I want to sell you this piece of property'--and play one against the other. Don't do that. If I'm looking at this property, usually [the local land trust] will contact me and say so-and-so contacted me. We're not going to be competing against each other. That's not what it's about. We work too close together to do that. It's not a bidding game. It's a conservation game. A protection game. A management game." [10]

The Roan Highlands is an example of a region that has seen long-term collaboration on acquisitions and stewardship, between multiple agencies and institutions. The Roan massif straddles the border between northwest NC and northeast TN, and consists of several peaks that are over 5,000 feet in elevation. The highlands are home to rare and endemic communities, including several endangered species. The mountains are also traversed by the Appalachian Trail, and they have become an important recreational area. The Southern Appalachian Highlands Conservancy, Appalachian Trail Conservancy, and the Nature

Conservancy, along with US National Forest, Fish and Wildlife Service, NCNHP, NCWRC, and the TN Dept of Environment and Conservation, collaborate on acquisitions, easements, stewardship of properties, and apply for joint grants, like a recent American Recovery and Reinvestment Act award that funds restoration work on the highlands.

Planning Partnerships:

I interviewed respondents from at least seven planning partnership groups. Planning partnerships are defined by multiple institutions from multiple levels (federal, state, and local government, private organizations such as land trusts, environmental education or advocacy nonprofits, and sometimes businesses) committed to a long-term collaborative working relationship within a specific region. Institutions come together to formulate a conservation plan for the region that allows the partners to establish overarching goals, and individual organizations work either independently or jointly, on particular aspects of goals. It is also interesting that, with the exception of two groups, planning partnerships are primarily dedicated to conserving rare, biodiverse, and highly threatened ecosystems.

On their Web Site, the Cape Fear Arch Conservation Collaboration says it is devoted to protecting and stewarding natural resources that support economy and quality of life in a region that extends over 12 counties in southeast NC and upper northeast SC. This area is set apart ecologically by a unique limestone formation that has lead to endemic species and communities found nowhere else in the world; it is also one of the fastest growing regions of the state. Partners include nonprofit conservation organizations, state and federal agencies, local soil and water conservation districts, two city governments and a county board of commissioners.

The Greater Uwharrie Conservation Partnership is based in south-central NC, an "ecotone" between the mountain, piedmont and Sandhills regions; as such, it is home to rare endangered species (Central Park NC 2010). According to one partner advocacy organization, the function of the group is to "collaborate and work together on projects that have some role in biodiversity conservation…All working groups coordinate to share information on grants, build on each other's efforts and provide outreach and technical guidance to landowners and community leaders." Partners include federal and state agencies, the NC Zoo, land trusts, the Environmental Defense Fund, and local advocacy groups.

The North Carolina Sandhills Conservation Partnership seeks to conserve the federally-endangered red-cockaded woodpecker (*Picoides borealis*) habitat and other ecosystems in the Sandhills region, particularly in the area surrounding Fort Bragg military base. Formed in 2000, its Web Site states that its steering committee consists of federal agencies, the US Army (specifically the Environmental Command of Fort Bragg,), the Nature Conservancy, Sandhills Area Land Trust, and the Sandhills Ecological Institute. There are at least an additional 18 groups involved in recovering red-cockaded woodpecker populations, protecting land, and creating new recreational areas.

The focus area of the Onslow Bight Conservation Partnership is a "rich mosaic" of marsh, wetland, longleaf pine, and other coastal ecosystems, according to the Nature Conservancy (TNC 2010). The partnership's activities are centered on Marine Corps Camp Lejenue and Cherry Point Air Station, and seek to protect base actives from development and protect biodiversity, including the red-cockaded woodpecker. The initiative, which began with the Nature Conservancy and Camp Lejeune, was recognized by the White House's 2005

"Cooperative Conservation" conference. Other partners include the NC Coastal Land Trust, NC Coastal Federation, Endangered Species Coalition, and state and federal agencies.

The Upper Neuse Clean Water Initiative began with the City of Raleigh aligning its burgeoning interest in actively protecting drinking water with the existing expertise and capacity of local land trusts. The Upper Neuse basin supplies water for the state capital and 14 local governments (a four-county region); land protection for protecting water quality also preserves intact ecosystems and creates recreation opportunities. Since 2005, the City of Raleigh has given $6 million towards acquiring key land parcels and pledged future contributions (Raleigh *News and Observer*, 22 Dec. 2010). Funding has also come from CWMTF. Partners include the Trust for Public Land, Triangle Land Conservancy, Conservation Trust for NC, Triangle Greenways Council, Tar River Land Conservancy, Eno River Association, and the Ellerbe Creek Watershed Association, along with the Triangle J Council of Governments (City of Raleigh 2010; Trust for Public Land 2006).

The Chatham County Conservation Partnership was initiated in 2006 to develop "strategies for a community conservation vision that builds awareness, protection and stewardship", according to its Web Site. There are over 40 participants, including local townships, federal agencies, nonprofits, private landowners, business, and a community college. The steering committee is Triangle Land Conservancy, Chatham County Soil & Water, NCNHP, US Fish and Wildlife Service. One product of the partnership is a GIS-based conservation plan map that will impact land development decisions in the county (CCP 2011).

The principal advantage of partnerships discussed by respondents is the ability to apply jointly for grants that institutions could not singularly have competed for with any

moniker of success. Funding sources favor partnerships for a variety of reasons. Multiple partners demonstrate a broad appeal and need for the project-in-question, and partnerships ensure efficient spending:

"Funders love partnerships -- to make sure they aren't funding the same group three times to do the same thing!" [32]

Partnerships in the coastal plain have been particularly interested in North American Wetlands Conservation Act (NAWCA) grants and have been able to receive grants because of Planning-Partnerships:

"It helps you in the ranking of applications into NAWCA if you are coming in as a partnership. So rather than a single organization or single agency coming in, we've found with Onslow Bight…[that] the NC Coastal Federation, the NC Coastal Land Trust, and TNC, all joining hands, with letters of support from the Marine Corps and others, has really been powerful." [1]

Respondents admitted that it was challenging (and sometimes bureaucratic) work to form and maintain a Planning-Partnership that met regularly, created a meaningful plan to which all could agree, and upheld individual commitments, etc. The end results, however, compensated for all the effort:

"The more partners you have involved, it definitely means a lot more work, a lot of the time, but I think *it can also mean the ability to do more protection and can also increase your capacity, definitely, and quality*." [5, my italics]

"It's more often more difficult to partner with an entity on a project, because there are multiple layers of approvals and different perspectives. But we've found that *it enriches a project, that it's -- in the end it's much, much better. And granting agencies love to see partnerships*." [23, my italics]

All in all, Planning-Partnerships have several benefits for partners involved. They model cooperation that is looked upon favorably by donors and diversify funding options as partners from different sectors bring different funding options that can be shared by all. They attract funding for planning as well as acquisition. Respondents stressed the importance of relationships, as partnerships can ease any potential contention through communication.

Furthermore, they can attract partners who may not be as willing to participate otherwise, because of these aforementioned benefits and the fact that partners maintain independence.

Partnerships also have the potential to lead to new and innovative conservation efforts. One respondent from the Upper Neuse Clean Water Initiative ventured to say that future innovation in land conservation would arise out of such collaborative and partnering work:

"What the shape of [the future] will take I can't predict, because of collaboration potential, the possibility of working across public-private lines, government/nonprofit lines, nonprofit/for profit lines, the potential in this area for voluntary land conservation is limitless" [3]

4.5 Theme: Opportunity

"Opportunistic conservation", or "*ad hoc* conservation", has traditionally described conservation efforts that may be motivated by aesthetics, recreation, wildlife management, or reasons other than those that seek to conserve a full spectrum of biodiversity and the processes that sustain biodiversity long term (Pressey et al. 1993; Pressey 1994). Opportunistic efforts to conserve land often work on the basis of whatever opportunities arise, rather than according to strict biological criteria. Therefore, the conservation biology literature has been critical about opportunistic land conservation efforts and has advocated for systematic conservation planning to ensure long-term viability of the full spectrum of biodiversity (also called "resilience and representativeness") (Margules and Pressey 2000).

In their 2007 editorial, Knight and Cowling argue a second interpretation of opportunism, calling it "a critical component of [a conservation plan's] effectiveness", and call for practices that "map conservation opportunities…and how to implement actions when opportunities appear." In other words, opportunities are necessary for the implementation of a conservation plan, as long as the opportunities fit within a greater plan. This kind of

opportunism has been labeled "informed" opportunism, which "balances biological priorities with opportunities for action" and is juxtaposed with *ad hoc* opportunism that altogether "ignores biodiversity values" (Pressey and Bottrill 2008).

The authors engaged in the "opportunism" debate agree that being open to opportunity is necessary, but conservation planning guides decision making in a defensible strategic manner that should ultimately lead to more efficient spending of resources on projects that have the highest levels of threat and irreplaceability. But what is opportunity for the professionals who work to conserve land in North Carolina? What would balancing opportunity and priority look like on the ground? How do NC professionals view opportunism?

4.5.1 The nature of opportunity

Interviewing respondents in NC about opportunism shows that "opportunity" has different faces in the land conservation world. For many respondents, opportunity consists of two things, the smiling face of a willing landowner, and the money to follow that landowner's willingness. As one respondent put it, it "if you don't have money, it doesn't mean anything":

"To be able to react to that [opportunity] takes money. And if somebody calls and says your number one priority property may go up for sale next year and if y'all guys want to buy it before it goes on the market, we'll give you three weeks to do that. That's great. *But if you don't have any money it doesn't mean anything*." [17, my italics]

Sometimes projects are chosen because they have leverage with funding agencies, or a project will score highly according to funding agency's award criteria:

"Several community leaders came to us and wanted us to engage in [agricultural] projects [in a particular area]. And at the same time, *yes it's great farmland, but there have also been resources available from the state and federal governments so that when you write the grants, those are easy properties*. They're good as far as bringing funding into make the projects possible—and the land

owners are interested in doing it.“ [17, my italics]

"You build momentum, you push and cajole, get the CWMTF behind it, and in a sense, the money will fall into place. *You don't do this with a weak project. I have an idea of what can fly*, *and what would have a hard time of flying*." [13, my italics]

Professionals also responded—in chorus—about the restraints placed on their work by the unpredictable real estate market and the fact that land can only be acquired for protection when a landowner is offering it for sale:

“With land acquisition it’s never a case of we can look at a map and say I want to go buy a piece of that red there [highlighted area on a map]. It’s always where the opportunity is… either there’s a willing landowner that we’re working with, or a piece of a land might happen to come on the market.” [12]

“Where there's willing seller, that's what you do.” [13]

“Conservation in itself can be very opportunity driven -- you need to work with willing sellers.” [16]

“The reality of our work is that it’s mostly opportunity driven - we work only w/ willing land owners. It comes down to that. And 80% of our work has come to us.” [32]

“Well, you can do a lot of planning and say, ‘Here's our top priority, these places,’ …but if people don't want to work with you, then, okay.” [23]

“You can't do deals with people who don't want to deal. So you have to have opportunities before you can do anything.” [22]

“You may have an area over here that you say that’s a top priority--we need to get land there. But nobody is selling land over there. But then you may have a tract that comes open somewhere else that’s for sale, that if it were a tract over here it wouldn’t really be as high a priority to you. But because there’s nothing here, this one is important. And I think that’s something you have to keep in mind. *Availability drives acquisition*.” [10, my italics]

To know and act on opportunities demands experience and expertise with the community, real estate market, and institutions (as well as the individuals and processes that make up those institutions): like the above professional says, "I have an idea of what can fly".

4.5.2 Responding to opportunity

"*Availability* drives acquisition" is a strong statement and seems to fly in the face of conservation planning literature, which encourages *biological targets* to drive protection efforts. Many respondents suggested statements similar to the same effect that land availability is a prime factor in decision-making, with an important caveat: organizations are not passive in how tracts become available, or how they come to hear about available tracts, and not everything available is selected for acquisition. For all respondents, they admitted and embraced the fact that conserving land had an element of unpredictability. Because of this, their organizations responded to opportunity by actively setting themselves up to be able to attract opportunity take advantages of opportunities that arose.

Creating opportunity

One respondent mused, "sometimes it's just dumb luck that stuff falls together. You just get in the right spot at the right time and everything comes together. *You like to think you're always that good but sometimes the stars line up right."* [10, my italics]. In spite of this sentiment, however, I have yet to come across a circumstance described by a respondent where his or her institution had not in some way, directly or indirectly, created opportunity.

Table 4.3 presents exemplary quotes that demonstrate institutions directly creating opportunity through actively pursuing land owners, and indirectly creating opportunity through "word of mouth", the way in which many respondents described how most landowners that contacted a land trust had heard about that land trust's work. Presumably word of mouth is influenced by an organization's public outreach, website, and media; word of mouth is also a factor of the relationship an organization has maintained with its previous

contracts. As discussed in section 4.4.1, an example of this is how land trusts and state agencies create opportunities for landowner contact by maintaining relationships with one another through partnerships.

Vetting opportunity

As organizations set themselves up to attract opportunity, respondents also acknowledged that opportunities had to fit their institutional mission (Table 4.3). For some land trusts that I spoke with, opportunities undergo a process of critical examination by staff, and an advisor board in some organizations. This is because projects are major investments by the organizations in the short term, and they then can be responsible for properties for perpetuity.

Taking on a project is an "enormous investment", according to respondent #33 (see below), and all respondents I talked with that engaged in land acquisition or easements, felt the weight of this responsibility, as the quotes below indicate. Even though opportunities might be tempting, respondents did not want to be "taken advantage of":

"Opportunism, it can look in a good light and a bad light…like walking that tight rope, of course we want to take advantage of opportunities but we don't want them to take advantage of us." [21]

"It's important that you not just take opportunity into hand just because the opportunity there. *You've got make sure that it makes sense and it is an important component to your overall goals*." [1, my italics]

"It's important to have a standard set of principles to filter opportunities so that you put effort into the right priorities that fit the right criteria. Each opportunity requires an enormous amount of work. Each one takes at least 1-2 years of work! …Just a note of caution that while getting a project done you still need to know if you're putting the energy into the right things." [33]

Table 4.3 Responses to opportunity based on institutional mission: creating opportunities that fit or vetting opportunities to make sure they fit.

"We're always creating opportunities too, *having identified a property that's important to our long term goals in a particular landscape*, and going to that landowner and continuing to work with them to convince them to make a decision to protect their property, and *sometimes it takes years and years, but you're creating that opportunity there*. You constantly come back to that landowner to see if anything has changed. Are there any changes in tax law that might be beneficial to them? Anything has happened within their family that might behoove them to now talk?…Frankly, in some cases it takes—I mean I've got a project right now I've been working on for 29 years." [1]	Created, Direct
"We'd been working for years on agricultural drainage in estuaries and what they do to water quality. One day somebody walks into our office to tell us that we can have their farm! They were farming corn all the way down to the estuary and the people figured we would be interested. *They came to us with the opportunities without it being planned. Now, if we'd had the elaborate planning process we would have come to the particular tract eventually, but it just worked out*." [33] "*A landowner who lived nearby tapped us on the shoulder and said, 'By the way, those people are getting older there.* I hear they're looking to sell it and divide it into 10-acre lots'. And that was one where we weren't looking to protect it, that area. That was an opportunity that we pursued rigorously, and everybody loved it in the end." [23]	Created, Indirect (word of mouth)
"I understand what you're saying, that land trusts typically respond to things that come our way. I think that's true to a degree. *I think most of the projects that we have done... are pre-identified, whether on paper*, *or in purpose*…So I think that we are opportunistic and we have to be, in terms of what comes our way, but *I feel like we still manage to do it as much as we can in an organized, discretionary process*." [8] And so, at the end of '99, we made it to the 2,000 acre goal…we did a little evaluation of the year in terms of land projects and what we were able to accomplish. I made the point that those 12 projects that we had identified early '99--- none of them were the projects that we closed by the end of '99. They were a whole set of other projects, 15 of them, that we didn't even have on our radar [in early 1999]. *But the point was that we had a criteria that we said, these are our values that we're going to work with private landowners to conserve* and we could not have predicted in January of '99 what those were going to be, but, Emily, *because we had those guidelines, we were able to stay true to our mission and our priorities*. We achieved that goal, just in a way that we couldn't have anticipated." [3]	Vetted

Not one respondent saw a negative side of opportunism in his or her own organization's work. Some did mention that there used to be less of a vetting process:

"[Land trusts] have their targeted areas. They're not just doing anything, anywhere. Once upon a time that was the case. Anything that would walk in the door we would jump at. There's some [areas] that we have that we are wondering why do we have these? Leftover from 20-25 years ago when they were donated, an opportunity that made sense at the time." [13]

What has changed since 20-25 years ago, as indicated in the above quote, that land trusts are more discerning today? Organizations are more professional, land is scarcer, there is more competition for funding, and acquiring more land means more management on the ground as well as more personnel, so organizations have a heavier burden to consider when making choices. Individual organizations have focused their mission and priorities as the land trust movement overall has strove for professional practices that will lead to permanence: more planning, accountability and transparency.

4.5.3 Final thoughts on Opportunity

As the above respondent states, "land trusts have their target areas" established in particular places to respond to specific development threats and to motivate resource conservation in their specific communities. Brewer (2003) demonstrates this emphasis in his historical account of the land conservancy movement as well. But within their specific target areas, not all conservation organizations have biological *representativeness* and *resiliency* as their prime goal. Neither do the funding organizations that award grants for acquisitions and easements. Neither do state agencies that have varying mandates to balance.

Certainly, biodiversity is a consideration of all the respondents I spoke with that were affiliated with organizations that purchase land or fund the purchase of land. But according

to respondents, the pragmatic nature of land conservation requires professionals to balance organizational mission and commitments (which may be to biodiversity, to maintaining cultural and historical heritage, to water quality, to agricultural preservation, etc.), land availability, funding, and other operational constraints.

Therefore, for land trust executive directors, being opportunistic is a necessary organizational trait in order for a land trust organization to successfully protect land. From one land trust executive director, and a director of a municipal land trust, being opportunistic makes an organization "poised" and "flexible":

"[Opportunism] means being as poised as possible *to be able to react to opportunities when they present things that you can't predict discretely…to have your programmatic foundations in place,* including your governance and financial management systems in place, such that [if there is] something that you can't count on happening you can respond if it starts to happen" [4]

"Being strategic is setting yourself in a direction, and opportunistic is more keeping your ears open and having the flexibility of steering the vehicle toward those opportunities if they meet your criteria. You don't want the opportunities to drive where you're going, but you want to be able to steer toward them when they are what you're looking for." [22]

Overall, the positive understanding of opportunity, opportunistic, and opportunism, is a very different understanding from the "ad hoc opportunism" debate that stems from furthering representative and resilient biodiversity. Yes, conservation efforts described by respondents in NC is opportunistic, in that it creates opportunities and takes advantage of opportunities in a vetted and informed process that balances many operational mandates and constraints, one of which may be biological priorities, depending on the organization.

4.6 Conclusion

My hope is that by presenting here the perspectives of a selection of conservation professionals, I provide other conservationists working in the state with the ability to position his or her particular work within a wider context and inform conversation about future

efficacy of conservation efforts. The land conservation field of 2010 is very different from how it was a decade ago. In many ways it is better off: more players are involved, and it is more professional, focused, transparent, and interconnected institutionally. Land conservation in North Carolina is carried out by hundreds of individuals who represent a variety of institutions with varying missions and support bases. Yet these institutions all share similar constraints and opportunities. The fate of public funding was tested during economic downturn of 2008 and organizations are still wondering in 2010 if their work will soon change in dramatic ways.

Overall, this past decade has been a time when institutions have learned how to best position themselves to create opportunities (including reaching out through partnerships with other institutions), react to opportunities that appear, and then vet opportunities according to mission guidelines. Professionals view conservation work as *necessarily opportunistic* and believe their organizations are positioned to attract opportunity and nimbly take advantage of opportunity that in within the purview of their organizational mission. Opportunities, however, are not isolated from institutions. Institutional changes have affected the amount of funding available and have in turn encouraged certain kinds of acquisitions. Simultaneously, as professionalization has increased and partnerships have become more collaborative, the ability to attract and vet opportunity has evolved.

Most respondents do not name the Million Acre Initiative as the catalyst for institutional change over the past decade. But just as institutions have affected opportunities, the Million Acre Initiative has affected institutions, particularly through state funding. For PARTF and ADFP, these grants leverage other funding sources from municipal and federal government, federal, and private organizations. While public state funding has increased,

according to the Land Trust Alliance, private donations have increased dramatically across the nation as well, though figures for NC specifically are not available (LTA 2005). It can be imagined that increased funding from the public and private sectors have allowed land trusts all over the state to take on projects that increase their organizations' visibility; as public dollars go to more project work, private donations can be used to increase an organization's outreach, expand staff numbers and fund further acquisitions or easements.

CHAPTER 5. Discussion

5.1 Conservation in North Carolina, 1999-2009

Land conservation activity in the state has increased dramatically since the turn of the 21st century. Trust funds have been funded at their highest levels since their instatement. Land trusts have profited from the state's funding levels and increased private donations and have made the NC land trust community a leader in the southeast. State agencies have acquired or put easement on over 350,000 acres of land, expanding ecosystem protection and opportunities for recreation. State agencies are also active in planning strategically for the future: the NCWRC's Wildlife Action Plan and NCDPR's New Parks for a New Century are two notable examples. Municipalities, particularly those with large urban centers, have established Open Space programs devoted to protecting land and investing in the benefits of water quality, open space, and recreational opportunities,

GIS analysis has highlighted several recent trends. There has been more focus on conserving piedmont lands and continued focus in the coastal plain and mountains. As NC becomes more urbanized, conservation lands are being established in more urban areas. New regions previously under-conserved, including along the Tar River, have been targeted over the past decade. Rare species tracked by NCNHP have been protected across the state, but newly established state areas, in particular, have high concentrations of NCNHP tracked

species and natural community types. Farmland preservation is increasing, particularly in the Piedmont where there are active farmland-focused land trusts.

Water resources in particular have been the focal point for many new conservation projects, and if better data were available on land acquisitions, the focus on water would likely be even more pronounced. Water protection may be an important way for conservation to achieve an even higher level of support from the public and government representatives. During the economic recession, after deliberation between the conservation community, the General Assembly, and the Governor, CWMTF received $50 million in appropriations in both the 2009-2010 and 2010-2011 budget years, showing that the trust fund still commands political support (Appendix F). Interviews with municipal-level conservation professionals indicated that their main leverage tool with their governments and voters was drinking water. The Upper Neuse Clean Water Initiative is an innovative partnership that has been able to motivate cities and municipalities in the Triangle region to think strategically about securing future water supply through land preservation; this is an example of conservation planning for a specific ecosystem service and is a model that could perhaps be followed by other regions that share common resource interests.

Partnerships have emerged as a prominent means of conservation work in NC, evident during interviews and in the process of assembling GIS data. "Property-partnerships", where institutions work together to conserve one specific property at a time, were emphasized in interviews to such an extent that it seems conservation institutions carry out their work in collaboration with other institutions more often than not. Simultaneously, multi-institutional "planning partnerships" are becoming the norm all across the state. However, partnerships that have been able to wrangle funding sources and dramatically alter their region are still the

exception, meaning that while "planning partnerships" hold promise, partnerships must be long-term commitments that include partners who can guarantee funding resources and other elements necessary for sustained conservation effectiveness.

5.2 Million Acre Initiative

Consideration of the last decade of conservation in North Carolina inevitably leads to questions about the role and success of the Million Acre Initiative. The mixture of quotes that began chapter two shows how conservation professionals interpret the effects of the initiative differently, from "strategic framework", to "positive opportunity", to "unfunded mandate." Although the million acre mark has not been met as of 2010, I argue that there have been some positive developments that emerged over the initiative's decade lifespan, including allied goals, including increased funding for conservation, increased collaboration towards the goal, involvement of local communities, and creation of a strategic plan to focus NC conservation efforts.

In particular, I argue that the Million Acre Initiative has created opportunities for the conservation community to leverage the government for conservation funding. This has principally happened through continual petitioning of the state legislature by individual organizations and collective efforts, especially Land for Tomorrow, to fund the trust funds. One respondent emphasized that the Initiative has been able to "fuel the political process"; praise for the strategy of using a numerical target as a way to motivate action—particularly an ambitious goal—was echoed by other respondents:

"As a smart politician [Gov. Hunt] probably knew that you set a goal, you set a target, and then the good will and interest that's generated around that will fuel the political process to put the funding resources, to put the policies, the legal frameworks, in place to make it happen." [29]

Other respondents spoke negatively about the fact that the language of the Million Acres Goal as written does not secure funds itself and thus the conservation community in subsequent years has had to invest resources towards holding the General Assembly accountable to fulfill the legislative mandate:

"It was just a placeholder, so it did no harm, but no good. It had no money associated with it and so there was little impetus for it to be carried out." [24]

Without momentum in the General Assembly for the initiative to be fulfilled, the conservation community had to step up to create motivation. This dynamic has shaped the way in which the government interacts with the conservation community. Respondents said that legislators respond well when Land for Tomorrow invokes the local conservation success of their constituents' communities, but are not as motivated by the existence of a legal mandate to reach a million acres:

But I don't think anybody's thinking about [the MAI] anymore. Most of the focus has kind of shifted in our community to talk more about Land for Tomorrow. [29]

However, I would argue that Land for Tomorrow would not be as successful today if not for the Million Acre Initiative in place as a model for leverage to be used by advocates to the legislature. Having the initiative in place has meant that the conservation community has had some practice joining their voices in a single rallying cry that could be used repetitiously and unanimously by many intuitions.

"It gave us a big number to look at and come back and say we're not getting there, we don't have enough resources to get there, we're only a fraction of the way towards the million acres that we need to see protected. And then that really helped pull everybody to really think what else we need to do to get the attention of people who make the decisions about public funding." [1]

How have local communities been part of the Million Acre Initiative partnership? New media from 1999 suggests Gov. Hunt was charging counties to be active in the MAI,

asking them to promote conservation through local bond initiatives. In response to local success passing bond referenda for open space preservation, Gov. Hunt is quoted saying that, "all of us need to get on fire about this where we live. Even rural areas like Bladen County. We need to get this going". The article concludes that the Governor wanted "to see local governments take the lead on preservation" (8 June 1999, Wilmington *Star News*).

Some counties in the state have successfully raised bonds. One municipal-level respondent said the establishment of the Initiative sent a strong signal to local leaders. Since then, in terms of local funding sources, there has not been a connection to a larger vision of statewide conservation goals:

"The big [Million Acre Initiative] kick off campaign of 1999 sent a signal throughout the state that land preservation was important so it helped cement the idea in the minds of our leaders here. At the time it played a strong role [in our county's conservation efforts]. Since then, do I think about the MAI daily? I got to be honest, no. Does the MAI influence land acquisition here? I don't believe it does…for instance, now we have a new Board and we've had little money since they've been in office. Those 5 new members, I doubt any of them know about the MAI…At the local level we don't have any [mandates] related to the MAI. I contribute data every year to the [NC DENR] report in terms of how much land we buy, but other than that…" [33]

Respondents from municipal Open Space programs suggested that the Initiative has not fueled conservation to happen at their local level in situations where local funding is involved. They do not see it as affecting day-to-day work or even influencing local-level land acquisition. NC DENR is a distant figure that asks for totals once a year, especially since the funding for a coordinator position was terminated in 2002:

"Other than turning in our totals at the end of the year ::*chuckle*:: they just kind of want to know what are you generally doing, well we're doing this, great, alright, talk to you next year." [2]

However, through PARTF, CMWTF, NHTF, and ADFP, the state has influenced land acquisition in many communities. PARTF requires matching grants from local government projects, and the number of applications PARTF receives well exceeds the amount they are

able to award. ADFP funds local agriculture conservation projects. CWMTF funds wastewater and stormwater innovations in communities, in addition to restoration and land acquisition. NHTF funds land acquisitions that often lead to parks, game lands, and other eco-tourism potential. Still, based on responses, respondents do not necessarily connect these funding sources with the Million Acre Initiative.

Another example of the disconnect between local communities and the state comes from one respondent in western North Carolina who said that in 1999 it was perceived that in the eyes of local residents a Million Acre Initiative would really be an avenue to have more land taken off the local tax base. At this time western NC counties already had over 50% of land in national forest and/or national park:

"I understand how important [the Million Acre Initiative] has been as an organizing principle, particularly in the center, as a policy decision, in trying to give logic to the trust funds and what not. *I never much used it expressly unless it was helpful in grant proposals*, *just again because it wasn't that relevant out here* [in western NC]. *There was in 2000 again the dominant paradigm was we had too many acres conserved so what do you need? … I would say it wasn't a very good banner to march under around here*." [4, my italics]

My conjecture is that municipalities and land trusts employ local messages about significance of place when it comes to gathering local support, such as messages that emphasize community, natural resources, and cultural history, unique to their operating base. Only when it comes to applying for state funding does their message becomes embedded in the context of the state, the Million Acre Initiative.

The different local needs and effectiveness of local messages is perhaps one part of the challenge to formulate and implement a strategic statewide conservation plan. According to respondents affiliated with private organizations and municipalities, the Conservation Planning Tool is in limited use in their sectors. These institutions are mostly local and have resource targets already defined by their missions and support base. Therefore what they

require is selection of individual parcels for purchase. The CPT is designed on a scale that identifies larger regions of priority, not parcels. According to the respondents I interviewed, the CPT has not identified new geographic focus areas for these institutions to conserve.

The CPT has revealed what areas would have a higher chance of winning state funding. This is because the CPT can be used by trust funds to determine what projects should been given higher priority for awards. In my own observations of trust fund meetings, particularly that of NHTF, applicants submitted how their proposals scored according to the CPT. Although only state agencies can apply for NHTF awards, agencies can partner with non profit organizations when targeting potential projects. CWMTF during part of their project funding assessment process also consults the Water Services Assessment tool from the CPT (personal communication). According to one land trust respondent, the CPT was not a roadmap that guided their organizational mission, but a "storytelling tool" to tell funders when the organization's priorities were in alignment with the tool. The CPT can be used as support or justification of an organization's work for state funding:

"What it did was show us we were working in all the right places, which was great. So then it doesn't provide you as much as a roadmap, but a storytelling tool." [21]

5.3 Where do we go from here?

As I describe in chapter two, conservation professionals were consulted for input as the Million Acre Initiative was shaped in the late 1990s. In the end, politics played a larger role than conservation science and advocacy in the shaping the final form of the Initiative statement. My research was most concerned with conservation professionals – but what about the political professionals who (through shaping legislation, deciding on funding

decisions, and writing policy) shape conservation at very high levels? Further documentation and analysis of the interaction between the political, scientific, and other elements involved in conservation would yield insight into how conservation is a matter of pragmatics, shaped by chance, happenstance, and opportunities.

I maintain, however, that the best sources for information on the actual policies that govern land conservation in the state are the professionals who work in the field. These individuals are aware of the local pressures and discourses, as well as the state and national discourses. They are a resource, holding knowledge that is locally grounded and connected with larger regional and even national policy. Drawing these ideas from my respondents about the future of conservation in NC, there several areas where change or emphasis is needed to have effective conservation.

Funding

The majority of my interviews were conducted in the shadow of the fall 2009 budget drama in the General Assembly when Governor Perdue was considering withdrawal of all appropriations funding as well as dedicated source funding for the trust funds. Therefore it was understandable that funding availability was a very salient issue for professionals. A typical quote from a respondent, when I asked him or her what was needed to encourage effective future conservation was: "before we can do anything we need to get funding back on track." Since that time, CWMTF did receive $50 million in appropriation and ADFP received $1.5 million in the 2009-2010 and the 2010-2011 budget cycles; NHTF and PARTF were allowed their bonds and tax funding.

The recession cuts revealed how precarious appropriations can be, and also showed how dedicated funding mechanisms could be more efficient. Respondents were frustrated with, as one professional described, the "inherently flawed" system that restricts funding for land conservation when real estate values are lowest:

"Our funding model for land protection in the state is inherently flawed…it only works well when we are in really good economic times. Because the sources of the money are only the highest when we are either in really good economic times and people are buying land…When the economy turns and those activities slow…we end up with very little acquisition money but at the same time in those poor economic conditions a lot of property becomes available and it becomes available at much more reasonable prices. And so it's actually 180 degrees the opposite of how it needs to work." [6]

In 2001, in the wake of the MAI, the Environmental Finance Center at the University of North Carolina submitted a report on possible financing schemes for the conservation of one million acres that shows that existing structures could administer the resources necessary to fund land conservation (Whisnant et al. 2001). For example, increasing the real estate transfer tax by $1 would yield $30 million annually, based on conservative real estate trends; bond options could generate hundreds of millions; increasing consumer water fees by $0.07/1000 gallons would yield $19 million annually; removing the sales tax cap on boat, plane, and locomotives could yield $10 million annually; a $1 landfill fee would yield $10 million annually. The authors of the report point out that weighing funding options is an "essentially a political choice"; any funding mechanism involves tradeoffs of costs, equity, and effectiveness.

Planning/Coordination

In my interviewing work, statewide planning, or the strategic statewide coordination of conservation institutions, proved to be a particularly complex topic. Even though respondents agreed that planning ideally leads to effective spending on conservation,

respondents overall were unsure what a statewide plan would look like, and were unsure how the state would best devise one, or whether the state even should devise one.

Respondents brought up several hurdles that a statewide plan would face. For example, what would be, as one respondent from NC DENR put it, "the mechanism to actually get people to abide by it"? Conservation plans are actually ubiquitous across the state: NC WRC, NC DPR, regional partnerships, the Nature Conservancy, and many individual land trusts all have their own plans. How would these plans integrate? The respondents from land trusts that I spoke with kept their plans private out of concern that landowners would be offended that their property was targeted, or that landowners would try to sell their property for an inflated value. How would the state negotiate making a plan? The CPT faced this issue early on, according to one respondent from NC DENR:

"[The CPT has] always been walking this line between we want a plan that's clear enough to guide our action, but we don't want a plan that's clear enough to let anybody get mad at us for having made a plan."

As discussed earlier in this chapter, the role of the Conservation Planning Tool in guiding, or focusing, conservation has yet to be firmly established. As a tool, it identifies areas of high priority across the state according to various criteria, including biodiversity, wildlife habitat, and water resources. NHTF and CWMTF consult it during their awards process, meaning that institutions that submit projects to these institutions know that higher scoring projects will be more successful. But the CPT has not, as of yet, become a plan for implementation and coordination. For example, since 1999, 3.1% of the CPT's highly significant Water Service areas have been protected, meaning that these areas need to be more intentionally targeted to address the CPT's recommendations. The trust funds, as major funders of conservation projects, have the ability to incorporate the CPT into their assessment criteria and give greater weight to the CPT's highly prioritized areas.

Future planning, or coordination, may be necessary depending on the future threat of climate change. Six respondents, when asked about future concerns, listed climate change. People are beginning to ask if climate change should affect their work and beginning to wonder what would it look like if this were the case. The sense from respondents is that the future effects of climate change are still such a black hole that it remains unclear how to react or plan:

"I get this message everyday it seems like that climate change is an issue that's going to change the way we look at the world or going to have to change the way we look at the world…Our traditional thinking has been we protect the sites with the highest integrity, we try and connect those sites, we try to have redundancy of things. But the message I've been getting is that there are some things that are just going to change so much!" [16]

Stewarding

For institutions that own land for conservation purposes, stewardship is a long term responsibility to manage the ecological integrity of a property according to their institutional mission or public responsibility; for properties owned under conservation easement, stewarding also involves upholding the integrity of legal contracts.

Many professionals had concerns about the future of conservations easements; they are still largely untested legal tools in which organizations are investing the majority of their resources. Professionals from land trusts expressed concerns throughout my interviews, particularly about how they would take on the legal battles that could result if landowners violated easements. For example, one land trust execute director commented:

"With each easement we take on we have the permanent responsibility of monitoring and, if necessary, enforcing the terms of the conservation easement…It's an adrenaline rush for all of us who do this work to be able to get to the point where we're at a table signing the paperwork, signing deeds that are being recorded at the courthouse with landowners, but that is really the beginning…The institution now has a permanent relationship and bond [that] we have to be ready to honor. And, if necessary, go to the mat. And we've had to do that in some modest ways so far. But if we don't do that, if we're not preparing ourselves, our organization, for that, we're being disingenuous to ourselves and we're dishonoring what it is that we're going to be putting in the hands…of the next set of staff members or the next set of board members, and we're dishonoring every other landowner who is working with us and honoring the terms of their easement if we're not ready to keep everybody held to the same account." [29]

For state agencies, dealings with landowners over the next several decades are sure to be complicated, and further research would do well to explore the future of legal issues with state-owned easements. Fortunately for land trusts, the Land Trust Alliance offers support and programs towards these aims; for instance, LTA offers legal Conservation Defense insurance for land trusts to help organizations with legal costs.[19]

Secondly, for both state agencies and land trusts, management of land is a concern as the need for land management personnel increases along with the extent of conservation acres. Management of the properties that are under easement is often a legal obligation that the conservation institution must uphold; otherwise they are violating their own covenant. Management, according to one affiliate of the Natural Heritage Program, is the "often neglected" side of the conservation world:

"[Management]…that's maybe the often neglected side of conservation because we get excited about acquisitions and we aren't able to put as much into management as we'd like to make sure that these areas are managed appropriately." [16]

This means that in the near future state agencies and county governments will need to start incorporating the possibility of legal fees into budget planning and land management will need to be given more precedent in budgets as necessary. The state trust funds may also need to consider offering funding for land management and land management planning.

New messages needed from state government

The idea that new messages are needed from the state government is inspired by an interview with the chairman of the NHTF. The "dilemma" to which the chairman refers in the following quote was underscored at a trust fund meeting in fall 2009 during the height of

[19]See www.landtrustalliance.org for more information.

the NC economic recession and budget decision-making in the state capitol; NHTF was asked by the governor to not make any press or other public announcements regarding its land conservation awards. The Governor's request was presumably to avoid public backlash during tight budget times, but according to the Chairman of NHTF:

"I think we have got to develop a mindset among our citizenry that preserving our natural areas is, to me, *just as important as education, economy, and jobs*. Right now we're facing a dilemma where we do not want to say we're laying off 'x' number of teachers while we're buying a large tract of land…But that large tract of land has its own benefits! It has potential to increase jobs, it has potential to help local economy where the land is located, and it has a real potential to educate young people on the importance of the out-of-doors. So, you know, it's a situation where I think we've got to educate the public that preserving our natural heritage is just as important as some of our other priorities."

New messages from the Governor and legislators would speak loud and clear to the fact that investment in natural capital is just as important as investing in jobs and education. A 2011 report from the Trust for Public Land proposes that every $1 spent by the state on land conservation since 1998 has returned $4 in economic benefit.[20] New messages would not only speak to the importance of land acquisition efforts: private land ownership is extensive and the state cannot directly purchase it or fund its purchase through private organizations. Incentive programs for forestry or wildlife management can maintain ecological integrity on private lands. The strengthening and upholding of regulatory laws can proactively help water and air quality. Once seen through to its fulfillment in terms of tally, funding support, and strategic focus, the legacy of Million Acre Initiative could be, at the very least, a sign that environmental protection is not a marginal constituency in North Carolina.

[20]Considering the economic returns of flood control, water quality protection, air pollution control, pollination services, wildlife habitat, for 289,000 acres acquired with $585 million of the trust fund's monies; there is also the positive financial impact on the forestry ($6 billion annual contribution to the NC economy), agriculture ($32 billion) and tourism ($4.3 billion) industries, and the military.

APPENDIX A: Water Services Assessment Criteria
Available: http://www.onencnaturally.org/pages/CPT_Detailed_Report.html

Value Categories

Ranking value in CPT*	Individual Input Layers	Description
Primary Classifications - Division of Water Quality		
10	Water Supply I (WS-I)	Within natural and undeveloped watersheds in public ownership.
9	Water Supply II (WS-II)	In predominantly undeveloped watersheds.
7	Water Supply III (WS-III)	Generally in low to moderately developed watershed.
5	Water Supply IV (WS-IV)	In moderately to highly developed watersheds or protected areas.
4	Water Supply V (WS-V)	Upstream and draining to Class WS- IV waters.
4	Class _SC (General Purpose saltwater)	Protected for secondary recreation.
7	Class _SB (Recreation Saltwater)	Protected for all SC uses in addition to primary recreation.
4	Class _C (General Purpose freshwater)	Protected for secondary recreation.
7	Class _B (Primary Recreation freshwater)	Protected for all C uses in addition to primary recreation.
Supplemental Classifications- Division of Water Quality		
Added through rulemaking by DWQ to the primary classifications to recognize and provide additional protection to waters with special uses or values.		
6	Future Water Supply (FWS)	Currently no water bodies in the state carry this designation.
9	High Quality Waters (HQW)	To protect and recognize waters that are rated excellent based on biological and physical/chemical characteristics.
10	Outstanding Resource Waters (ORW)	Excellent water quality and being of exceptional state or national ecological or recreational significance.
9	Unique Wetland (UWL)	Of exceptional state or national ecological significance.
5	Benthos Database, Good	Locality and collection information for benthic macro invertebrates.
9	Benthos Database, Excellent	
5	Fish Community Database, Good	Inventory converted into NC Index of Biotic Integrity score.
9	Fish Community Database, Excellent	
Wetlands		
Wetlands maps refined by the NC Division of Coastal Management, and rated for function		
9	CREWS, Exceptional	NC Coastal Region Evaluation of Wetland Systems inventory
6	CREWS, Substantial	
2	CREWS, Beneficial	
5	National Wetland Inventory	USFWS National Wetland Inventory of 1983
Other Data Sets		
8	Head Waters	Data needs to be developed – not yet included in CPT
9	Native Trout Waters - Wildlife Resources Commission	Contain the naturally occurring and reproducing strains of Northern and Southern Appalachian Brook Trout
2	Riparian Zones and 100 Year Flood Plains	
Groundwater Recharge		
According to the South East Gap Analysis Project; land use used as a proxy for groundwater protection.		

3	Row crops and quarries	
4	Barren	
5	Pasture and grasses	
6	Natural Cover	
Source Water Assessment Program Ratings		
All drinking water sources used by public water supply systems have a susceptibility rating from DWQ. Inherent vulnerability refers to the physical characteristics and existing conditions of the watershed or aquifer.		
8	Higher Susceptibility Rating	
6	Moderate Susceptibility Rating	
4	Lower Susceptibility Rating	
Shellfish Sanitation		
All shellfish growing areas are classified in accordance with National Shellfish Sanitation Program, by the NC Division of Marine Fisheries		
9	Approved Shellfish Areas	
9	Conditionally Approved Open Areas	
5	Conditionally Closed Areas	
Recreational Waters		
8	Tier I Swimming Areas	Areas that provide important water use for residents and tourists in NX.
7	Tier II Swimming Areas	Used less often than Tier I
5	Tier III Swimming Areas	Used less often than Tier II
Designated Rivers		
8	National Wild and Scenic River	The National Wild and Scenic Rivers Act protects designated rivers that have Outstanding Remarkable Values
8	State Natural and Scenic Rivers	Components of the State Parks System that have been designated in accordance with the Natural and Scenic Rivers Act of 1971
8	State Scenic and Recreational Trails	Components of the State Parks System.
7	Congressionally Authorized Study Rivers	The National Wild and Scenic Rivers Act provided some measure of protection for certain rivers while they are studied
7	U.S. Forest Service Eligible Rivers	Located within the proclamation boundary of a National Forest or adjacent to it.
5	National Rivers Inventory Segment	May potentially qualify as National Wild, Scenic or Recreational rivers.

*

1-4 moderate conservation value
5-7 medium conservation value
8-10 highest conservation value

APPENDIX B: GAP COVER TYPES OCCURING IN NORTH CAROLINA

GROUPED TYPES	**GAP TYPE**
OPEN WATER	Open Water (Fresh)
	Open Water (Brackish/Salt)
DEVELOPED	Developed Open Space
	Low Intensity Developed
	Medium Intensity Developed
	High Intensity Developed
CULTIVATED	Pasture/Hay
	Row Crop
LOW VEGETATION	Bare Sand
	Bare Soil
	Quarry/Strip Mine/Gravel Pit
	Unconsolidated Shore (Lake/River/Pond)
	Atlantic Coastal Plain Large Natural Lakeshore
APPALACHIAN BALD	Southern Appalachian Grass and Shrub Bald - Herbaceous Modifier
	Southern Appalachian Grass and Shrub Bald - Shrub Modifier
APPALACHIAN BOG	Southern and Central Appalachian Bog and Fen
APPALACHIAN ROCKY	Southern Appalachian Rocky Summit
	Southern Appalachian Granitic Dome
	Southern Appalachian Montane Cliff
APPALACHIAN EVERGREEN	Central and Southern Appalachian Spruce-Fir Forest
	Southern Appalachian Low Mountain Pine Forest
	Southern Appalachian Montane Pine Forest and Woodland
APPALACHIAN MIXED	Appalachian Hemlock-Hardwood Forest
APPALACHIAN DECIDUOUS	Central and Southern Appalachian Montane Oak Forest
	Central and Southern Appalachian Northern Hardwood Forest
	Southern and Central Appalachian Cove Forest
	Southern and Central Appalachian Oak Forest
	Southern and Central Appalachian Oak Forest - Xeric
PIEDMONT ROCKY	Southern Piedmont Cliff
	Southern Piedmont Granite Flatrock
PIEDMONT MIXED	Southern Piedmont Dry Oak-(Pine) Forest - Hardwood Modifier
	Southern Piedmont Dry Oak-(Pine) Forest - Loblolly Pine Modifier
	Southern Piedmont Mesic Forest
	Northeastern Interior Dry Oak Forest - Mixed Modifier
	Southern Piedmont Dry Oak-(Pine) Forest - Mixed Modifier
	Southern Ridge and Valley Dry Calcareous Forest - Pine modifier
MANAGED PINE	Evergreen Plantations or Managed Pine (can include dense successional regrowth)
HERBACEOUS	Ridge and Valley Calcareous Valley Bottom Glade and Woodland
	Southern Piedmont Glade and Barrens
	Successional Shrub/Scrub (Clear Cut)
	Successional Shrub/Scrub (Utility Swath)
	Successional Shrub/Scrub (Other)
	Clearcut - Grassland/Herbaceous
	Other - Herbaceous

cont…

GROUPED TYPES	GAP TYPE
	Utility Swath - Herbaceous
LONGLEAF	Atlantic Coastal Plain Fall-Line Sandhills Longleaf Pine Woodland - Loblolly Modifier
	Atlantic Coastal Plain Fall-line Sandhills Longleaf Pine Woodland - Open Understory Modifier
	Atlantic Coastal Plain Fall-line Sandhills Longleaf Pine Woodland - Scrub/Shrub Understory Modifier
	Atlantic Coastal Plain Upland Longleaf Pine Woodland
	Southeastern Interior Longleaf Pine Woodland
	Central Atlantic Coastal Plain Wet Longleaf Pine Savanna and Flatwoods
COASTAL PLAIN MARITIME	Atlantic Coastal Plain Central Maritime Forest
	Atlantic Coastal Plain Northern Maritime Forest
COASTAL PLAIN MIXED FOREST	Atlantic Coastal Plain Dry and Dry-Mesic Oak Forest
	Atlantic Coastal Plain Mesic Hardwood and Mixed Forest
RIVERINE FLOODPLAIN	Atlantic Coastal Plain Blackwater Stream Floodplain Forest - Forest Modifier
	Atlantic Coastal Plain Brownwater Stream Floodplain Forest
	Atlantic Coastal Plain Small Blackwater River Floodplain Forest
	Atlantic Coastal Plain Small Brownwater River Floodplain Forest
	South-Central Interior Large Floodplain - Forest Modifier
	South-Central Interior Small Stream and Riparian
	Southern Piedmont Large Floodplain Forest - Forest Modifier
	Southern Piedmont Small Floodplain and Riparian Forest
	South-Central Interior Large Floodplain - Herbaceous Modifier
SWAMP/POCOSIN	Atlantic Coastal Plain Nonriverine Swamp and Wet Hardwood Forest - Taxodium/Nyssa Modifier
	Atlantic Coastal Plain Nonriverine Swamp and Wet Hardwood Forest - Oak Dominated Modifier
	Atlantic Coastal Plain Clay-Based Carolina Bay Forested Wetland
	Atlantic Coastal Plain Northern Basin Swamp and Wet Hardwood Forest
	Atlantic Coastal Plain Peatland Pocosin
	Atlantic Coastal Plain Streamhead Seepage Swamp, Pocosin, and Baygall
	Southern Piedmont/Ridge and Valley Upland Depression Swamp
TIDAL SWAMP/MARSH	Atlantic Coastal Plain Northern Tidal Wooded Swamp
	Atlantic Coastal Plain Southern Tidal Wooded Swamp
	Atlantic Coastal Plain Central Fresh-Oligohaline Tidal Marsh
	Atlantic Coastal Plain Embayed Region Tidal Freshwater Marsh
	Atlantic Coastal Plain Northern Fresh and Oligohaline Tidal Marsh
	Atlantic Coastal Plain Central Salt and Brackish Tidal Marsh
	Atlantic Coastal Plain Embayed Region Tidal Salt and Brackish Marsh
	Atlantic Coastal Plain Northern Tidal Salt Marsh
DUNE/BEACH	Atlantic Coastal Plain Sea Island Beach
	Atlantic Coastal Plain Northern Dune and Maritime Grassland
	Atlantic Coastal Plain Southern Dune and Maritime Grassland

APPENDIX C: LAND CONSERVED BY COUNTY

County	Tier	RUC	County Size, Acres	Million Acre Portfolio, Acres	All Conservation Lands Database, Acres	% of conservation lands conserved after Jan 1 1999	% of county that is under conservation
SWAIN	2	8	345,587.9	4,187.4	246061.9	1.7%	71.2%
GRAHAM	1	9	192,911.9	947.7	116676.5	0.8%	60.5%
CLAY	1	9	141,328.9	41.2	66701.4	0.1%	47.2%
MACON	2	7	332,573.2	2,191.0	156374.2	1.4%	47.0%
TRANSYL-VANIA	2	6	243,392.5	18,190.0	111520.4	16.3%	45.8%
HAYWOOD	3	2	354,865.1	13,279.8	148809.2	8.9%	41.9%
HOKE	2	2	251,090.4	1,038.5	98323.8	1.1%	39.2%
CHEROKEE	2	9	298,867.2	952.0	93928.9	1.0%	31.4%
TYRRELL	1	9	389,776.3	31,797.9	110291.6	28.8%	28.3%
JACKSON	2	6	316,710.5	4,522.2	88302.6	5.1%	27.9%
MCDOWELL	1	6	286,755.8	6,503.7	76068.8	8.5%	26.5%
ONSLOW	2	3	524,462.2	8,061.7	136994.5	5.9%	26.1%
YANCEY	2	8	200,344.6	2,289.1	51658.7	4.4%	25.8%
DARE	2	5	799,121.9	2,662.2	199910.3	1.3%	25.0%
BURKE	1	2	328,395.9	26,355.0	81883.2	32.2%	24.9%
AVERY	2	8	158,360.9	4,025.7	38447.4	10.5%	24.3%
PENDER	2	2	563,448.7	43,404.2	111116.8	39.1%	19.7%
MADISON	2	2	289,128.8	1,662.9	56715.9	2.9%	19.6%
CRAVEN	2	5	493,361.5	10,538.4	96758.2	10.9%	19.6%
HYDE	1	9	882,040.9	21,106.8	171060.7	12.3%	19.4%
WASHING-TON	1	7	265,590.2	7,512.7	50037.4	15.0%	18.8%
CALDWELL	1	2	303,783.2	8,929.5	56005.6	15.9%	18.4%
CARTERET	3	4	665,408.8	9,966.4	120487.6	8.3%	18.1%
DURHAM	3	2	191,089.5	2,575.5	34525.5	7.5%	18.1%
GATES	1	8	221,245.7	6,030.7	38328.7	15.7%	17.3%
CAMDEN	1	8	195,563.3	7,257.0	33513.1	21.7%	17.1%
HENDER-SON	3	2	240,055.0	15,415.6	39550.2	39.0%	16.5%
BUNCOMBE	3	2	422,189.2	10,609.8	66764.0	15.9%	15.8%
MITCHELL	1	9	141,835.5	612.9	20852.0	2.9%	14.7%

County	Tier	RUC	County Size, Acres	Million Acre Portfolio, Acres	All Conservation Lands Database, Acres	% of conservation lands conserved after Jan 1 1999	% of county that is under conservation
CUMBERLAND	1	2	421,202.1	6,139.2	61023.3	10.1%	14.5%
SCOTLAND	1	6	205,394.7	1,998.8	29684.9	6.7%	14.5%
VANCE	1	4	172,724.4	416.5	23958.5	1.7%	13.9%
JONES	1	8	303,755.8	704.4	41898.3	1.7%	13.8%
MONTGOMERY	1	6	320,860.1	2,147.9	43543.9	4.9%	13.6%
RICHMOND	1	4	306,894.2	3,404.5	40642.3	8.4%	13.2%
BRUNSWICK	3	2	573,643.1	48,920.0	71402.7	68.5%	12.4%
POLK	2	8	152,720.0	6,824.0	17020.6	40.1%	11.1%
CURRITUCK	2	1	283,933.7	2,275.8	30566.8	7.4%	10.8%
BERTIE	1	9	474,421.6	3,667.3	48213.9	7.6%	10.2%
ORANGE	3	2	256,968.8	11,139.1	26073.8	42.7%	10.1%
WATAUGA	2	6	200,036.2	8,349.4	19912.5	41.9%	10.0%
CHATHAM	3	2	453,690.2	3,552.5	44233.7	8.0%	9.7%
BLADEN	1	6	568,139.6	4,622.2	53908.5	8.6%	9.5%
NEW HANOVER	3	2	140,534.2	2,085.1	12831.9	16.2%	9.1%
ALLEGHANY	1	9	150,006.0	1,932.7	13470.5	14.3%	9.0%
WAKE	3	2	547,995.4	3,939.6	46734.6	8.4%	8.5%
WILKES	1	6	485,694.3	9,782.9	37159.9	26.3%	7.7%
MARTIN	1	6	295,971.8	606.5	21789.6	2.8%	7.4%
GRANVILLE	2	6	343,236.4	5,892.2	25006.0	23.6%	7.3%
RUTHERFORD	1	4	361,791.1	10,411.1	25543.2	40.8%	7.1%
HALIFAX	1	4	468,009.0	8,932.6	29245.7	30.5%	6.2%
CASWELL	1	8	274,504.8	2,288.4	17136.1	13.4%	6.2%
ASHE	2	9	273,893.0	6,802.5	15735.3	43.2%	5.7%
WARREN	1	8	283,768.3	2,962.9	15859.7	18.7%	5.6%
HARNETT	2	4	384,759.0	1,273.3	21243.1	6.0%	5.5%
COLUMBUS	1	6	610,019.3	9,785.7	27975.7	35.0%	4.6%
HERTFORD	1	7	231,307.4	1,488.8	10359.4	14.4%	4.5%
GASTON	2	1	232,694.5	5,086.6	9278.2	54.8%	4.0%
MECKLENBURG	3	1	351,606.4	6,953.7	13620.3	51.1%	3.9%

County	Tier	RUC	County Size, Acres	Million Acre Portfolio, Acres	All Conservation Lands Database, Acres	% of conservation lands conserved after Jan 1 1999	% of county that is under conservation
SURRY	1	4	345,225.2	7,346.3	12053.0	61.0%	3.5%
FRANKLIN	2	2	316,685.3	9,788.4	10336.0	94.7%	3.3%
MOORE	3	4	451,347.3	3,422.5	13588.8	25.2%	3.0%
RANDOLPH	2	2	505,668.0	3,164.5	14932.9	21.2%	3.0%
PAMLICO	2	9	359,453.2	5,410.9	10408.8	52.0%	2.9%
PASQUO-TANK	2	7	185,082.4	572.7	5001.1	11.5%	2.7%
STOKES	2	2	291,801.7	504.1	7622.4	6.6%	2.6%
ANSON	1	1	343,568.1	973.6	8706.5	11.2%	2.5%
STANLY	2	6	258,886.6	1,772.0	6493.6	27.3%	2.5%
FORSYTH	3	2	263,718.2	175.7	6082.7	2.9%	2.3%
BEAUFORT	1	6	613,372.4	5,009.2	14083.3	35.6%	2.3%
DAVIE	2	2	170,591.5	680.5	3756.2	18.1%	2.2%
WAYNE	1	3	356,469.3	1,574.9	7482.6	21.0%	2.1%
ROWAN	2	4	335,082.5	4,900.7	6735.0	72.8%	2.0%
CLEVELAND	1	4	299,697.6	1,879.1	5216.0	36.0%	1.7%
CHOWAN	1	7	149,345.1	1,714.4	2490.3	68.8%	1.7%
SAMPSON	2	6	605,866.7	8,536.7	9893.0	86.3%	1.6%
ROBESON	1	4	608,191.9	2,563.5	9743.6	26.3%	1.6%
JOHNSTON	3	2	509,250.4	3,110.4	8056.2	38.6%	1.6%
PITT	2	3	419,067.9	928.8	5764.9	16.1%	1.4%
DUPLIN	2	6	524,331.2	0.0	6980.8	0.0%	1.3%
EDGE-COMBE	1	3	324,302.1	1,750.1	4237.2	41.3%	1.3%
IREDELL	3	4	379,626.2	2,785.1	4426.7	62.9%	1.2%
ROCKING-HAM	1	2	366,053.1	2,704.8	4005.3	67.5%	1.1%
LEE	2	4	165,914.5	1,124.4	1731.7	64.9%	1.0%
GUILFORD	3	2	420,968.9	1,683.2	4145.8	40.6%	1.0%
NORTHAM-PTON	1	9	351,931.7	712.7	3394.7	21.0%	1.0%
LENOIR	1	4	257,265.8	333.5	2461.7	13.5%	1.0%
NASH	2	3	347,339.3	1,322.9	3133.5	42.2%	0.9%
LINCOLN	3	4	196,551.2	1,736.7	1743.4	99.6%	0.9%

County	Tier	RUC	County Size, Acres	Million Acre Portfolio, Acres	All Conservation Lands Database, Acres	% of conservation lands conserved after Jan 1 1999	% of county that is under conservation
CABARRUS	3	1	233,367.1	394.9	2062.9	19.1%	0.9%
ALAMANCE	2	3	278,127.0	846.3	2196.0	38.5%	0.8%
CATAWBA	2	2	264,833.7	495.5	1503.7	33.0%	0.6%
UNION	3	1	409,365.2	778.8	2135.3	36.5%	0.5%
DAVIDSON	2	4	363,215.1	103.8	1680.9	6.2%	0.5%
YADKIN	2	2	216,142.6	90.4	766.2	11.8%	0.4%
PERSON	2	2	258,586.3	395.5	478.0	82.7%	0.2%
WILSON	1	4	239,491.1	36.2	429.1	8.4%	0.2%
ALEXANDER	2	2	168,641.0	191.7	293.1	65.4%	0.2%
PERQUIMANS	2	9	210,532.8	283.4	292.3	97.0%	0.1%
GREENE	1	3	170,453.8	134.3	144.6	92.9%	0.1%

APPENDIX D: Species and Natural Communities that are not tracked by NC NHP on any conservation land.

LATIN NAME	COMMON NAME	HABITAT	TYPE*	ACRES TRACKED
Adlumia fungosa	Climbing Fumitory	Terrestrial	VP	17.30
Anticlea glauca	White Camas	Terrestrial	VP	19.36
Arabis missouriensis	Missouri Rockcress	Terrestrial	VP	7.43
Asclepias purpurascens	Purple Milkweed	Wetland	VP	1.53
Asplenium bradleyi	Bradley's Spleenwort	Terrestrial	VP	0.04
Asplenium heteroresiliens	Carolina Spleenwort	Terrestrial	VP	46.26
Asplenium pinnatifidum	Lobed Spleenwort	Terrestrial	VP	12.72
Asplenium ruta-muraria	Wall-rue Spleenwort	Terrestrial	VP	212.26
Balduina atropurpurea	Purple-disk Honeycomb-head	Wetland	VP	1.26
Barbaetis benfieldi	Benfield's Bearded Small Minnow Mayfly	Aquatic	I	16.11
Callitriche terrestris	Terrestrial Water-starwort	Wetland	VP	0.53
Callophrys irus	Frosted Elfin	Terrestrial	I	8.41
Carex basiantha	Widow Sedge	Terrestrial	VP	40.70
Carex canescens ssp. disjuncta	Silvery Sedge	Wetland	VP	12.25
Carex decomposita	Cypress Knee Sedge	Wetland	VP	1.21
Carex leptonervia		Wetland	VP	1.33
Carex lupuliformis	Hop-like Sedge	Terrestrial	VP	136.31
Carex socialis	Social Sedge	Wetland	VP	0.17
Carya myristiciformis	Nutmeg Hickory	Wetland	VP	583.12
Cephaloziella hampeana	A Liverwort	Terrestrial	NP	1.13
Chamaesyce cordifolia	Heartleaf Sandmat	Terrestrial	VP	0.68
Chrysoma pauciflosculosa	Woody Goldenrod	Terrestrial	VP	6.07
Coastal plain marl outcrop		Terrestrial	NC	44.89
Collinsonia tuberosa	Piedmont Horsebalm	Terrestrial	VP	5.80
Collinsonia verticillata	Whorled Horsebalm	Terrestrial	VP	15.94
Cornus asperifolia		Wetland	VP	590.84
Corallorhiza wisteriana	Spring Coral-root	Terrestrial	VP	161.79
Coreopsis grandiflora var. grandiflora	Large-flowered Tickseed	Terrestrial	VP	23.07
Coscinodon cribrosus	Copper Grimmia	Terrestrial	NP	192.90
Cottus caeruleomentum	Blue Ridge Sculpin	Aquatic	V	59.92
Cottus carolinae	Banded Sculpin	Aquatic	V	108.00
Crocanthemum nashii	Florida Scrub Frostweed	Terrestrial	VP	0.71
Cyperus granitophilus	Granite Flatsedge	Terrestrial	VP	1.87
Cyperus virens	Green Flatsedge	Terrestrial	VP	0.12
Cyprinella zanema	Santee Chub	Aquatic	V	23.64
Delphinium exaltatum	Tall Larkspur	Terrestrial	VP	35.10
Dichanthelium boreale	Northern Witch Grass	Terrestrial	VP	50.45
Dicranella rufescens	Red Fork Moss	Terrestrial	NP	192.90
Diplophyllum apiculatum var. taxifolioides	A Liverwort	Terrestrial	NP	30.74
Eleocharis vivipara	Viviparous Spikerush	Wetland	VP	1.81
Entodon sullivantii	Sullivant's Entodon	Terrestrial	NP	192.90
LATIN NAME	COMMON NAME	HABITAT	TYPE*	ACRES TRACKED
Epidendrum magnoliae	Green Fly Orchid	Wetland	VP	61.88

Epilobium ciliatum	Purpleleaf Willowherb	Wetland	VP	15.00
Euphorbia mercurialina	Cumberland Spurge	Terrestrial	VP	1.83
Euphyes dukesi dukesi	Dukes' Skipper	Wetland	I	3.29
Eurycea longicauda	Longtail Salamander	Wetland	V	20.12
Fusconaia subrotunda	Long-solid	Aquatic	I	8.06
Gentianopsis crinita	Fringed Gentian	Terrestrial	VP	2.15
Gillenia stipulata	Indian Physic	Terrestrial	VP	0.53
Helenium brevifolium	Littleleaf Sneezeweed	Wetland	VP	15.74
Helonias bullata	Swamp Pink	Wetland	VP	86.14
Heuchera pubescens	Downy Alumroot	Terrestrial	VP	8.24
Hibiscus aculeatus	Comfortroot	Wetland	VP	26.59
Hydrastis canadensis	Goldenseal	Terrestrial	VP	16.13
Hyla versicolor	Northern Gray Treefrog	Wetland	V	12.51
Ilex longipes	Georgia Holly	Terrestrial	VP	13.48
Ipomoea imperati		Terrestrial	VP	13.41
Iris prismatica	Slender Blue Iris	Wetland	VP	2.64
Lachnocaulon minus	Brown Bogbutton	Wetland	VP	26.80
Lanius ludovicianus	Loggerhead Shrike	Terrestrial	V	162.05
Lasmigona decorata	Carolina Heelsplitter	Aquatic	I	61.44
Lilaeopsis carolinensis	Carolina Grasswort	Aquatic	VP	15.56
Lilium canadense ssp. editorum	Red Canada Lily	Wetland	VP	12.03
Lilium philadelphicum var. philadelphicum	Wood Lily	Terrestrial	VP	0.31
Linum floridanum var. chrysocarpum	Yellow-fruited Flax	Wetland	VP	3.98
Lupinus villosus	Lady Lupine	Terrestrial	VP	14.30
Macrocoma sullivantii	Sullivant's Maned-moss	Terrestrial	NP	210.51
Maritime shrub swamp		Wetland	NC	4.87
Marsupella emarginata var. latiloba	A Liverwort	Wetland	NP	192.90
Minuartia uniflora	Single-flowered Sandwort	Terrestrial	VP	16.80
Monarda media	Purple Bee-balm	Terrestrial	VP	11.74
Mustela nivalis	Least Weasel	Terrestrial	V	740.22
Mycteria americana	Wood Stork	Wetland	V	268.91
Myriophyllum pinnatum	Cutleaf Water-milfoil	Wetland	VP	1.21
Nardia scalaris ssp. botryoidea	A Liverwort	Terrestrial	NP	192.90
Northern hardwood forest (beech gap subtype)		Terrestrial	NC	90.47
Oenothera riparia	Riverbank Evening-primrose	Terrestrial	VP	1.92
Oligoneuron rigidum var. glabratum	Southeastern Bold Goldenrod	Terrestrial	VP	2.31
Parietaria praetermissa	Large-seed Pellitory	Terrestrial	VP	3.74
Paronychia herniarioides	Michaux's Whitlow-wort	Terrestrial	VP	1.11
Passerculus sandwichensis	Savannah Sparrow	Terrestrial	V	20.94
Percina rex	Roanoke Logperch	Aquatic	V	74.11
Percina squamata	Olive Darter	Aquatic	V	193.95
LATIN NAME	COMMON NAME	HABITAT	TYPE*	ACRES TRACKED
Phacelia maculata	Spotted Phacelia	Terrestrial	VP	0.19
Plagiochila ludoviciana	A Liverwort	Terrestrial	NP	40.46
Pleurobema oviforme	Tennessee Clubshell	Aquatic	I	7.64
Poa paludigena	Bog Bluegrass	Wetland	VP	6.25

Porella wataugensis	A Liverwort	Terrestrial	NP	9.87
Pseudacris brachyphona	Mountain Chorus Frog	Wetland	V	60.21
Pycnanthemum setosum	Awned Mountain-mint	Terrestrial	VP	0.13
Quercus ilicifolia	Bear Oak	Terrestrial	VP	3.84
Rhynchospora harperi	Harper's Beaksedge	Wetland	VP	2.07
Rhynchospora tracyi	Tracy's Beaksedge	Wetland	VP	14.83
Ruellia strepens	Limestone Wild-petunia	Terrestrial	VP	20.50
Sabatia kennedyana	Plymouth Gentian	Wetland	VP	2.68
Sagittaria chapmanii	Chapman's Arrowhead	Wetland	VP	3.06
Sagittaria weatherbiana	Grassleaf Arrowhead	Wetland	VP	215.51
Sand and mud bar		Wetland	NC	0.55
Sarracenia minor	Hooded Pitcher Plant	Wetland	VP	1.46
Sceptridium jenmanii	Alabama Grape-fern	Terrestrial	VP	13.44
Scirpus lineatus	Drooping Bulrush	Terrestrial	VP	258.64
Scleria reticularis	Netted Nutrush	Wetland	VP	21.81
Sedum pusillum	Puck's Orpine	Terrestrial	VP	31.66
Solidago leavenworthii	Leavenworth's Goldenrod	Wetland	VP	4.07
Solidago plumosa	Yadkin River Goldenrod	Wetland	VP	0.41
Solidago radula	Western Rough Goldenrod	Terrestrial	VP	2.78
Spartina pectinata	Freshwater Cordgrass	Wetland	VP	0.62
Sphagnum squarrosum	Squarrose Peatmoss	Wetland	NP	192.90
Spiranthes laciniata	Lace-lip Ladies'-tresses	Wetland	VP	2.07
Stylisma aquatica	Water Dawnflower	Wetland	VP	4.53
Thoburnia hamiltoni	Rustyside Sucker	Aquatic	V	3.25
Tortula ammonsiana	Ammons's Tortula	Terrestrial	NP	11.56
Tortula papillosa	Papillose Tortula	Terrestrial	NP	0.87
Tradescantia virginiana	Virginia Spiderwort	Terrestrial	VP	192.90
Trichechus manatus	West Indian Manatee	Aquatic	V	423.90
Trichophorum cespitosum	Deerhair Bulrush	Terrestrial	VP	1.41
Villosa trabalis	Cumberland Bean	Aquatic	I	36.95
Wet marl forest		Wetland	NC	494.46
Woodsia appalachiana	Appalachian Cliff Fern	Terrestrial	VP	0.61
Xyris chapmanii	Chapman's Yellow-eyed-grass	Wetland	VP	8.21
Zephyranthes simpsonii	Rain Lily	Terrestrial	VP	25.61

Type: NP = Nonvascular Plant; VP = Vascular Plant; I = Invertebrate; V = Vertebrate; NC = Natural Community Type.

APPENDIX E: LAND FOR TOMORROW ACTION ALERTS FROM 2009

For budget year 2009-2010:

Received 16 June 2009
From: info@landfortomorrow.org
Subject: "Action Alert: Funding for Land and Water Conservation"

Take Action Now

Action Alert: Funding for Land and Water Conservation

Urge Legislators to Support Land Conservation Funding

Funding for the N.C. Clean Water Management Trust Fund (CWMTF) and the N.C. Agricultural Development & Farmland Preservation Trust Fund (AFPTF) is in jeopardy and we need your help.

Please contact your legislators **immediately** and urge them to provide significant funding for land and water conservation as they make final budget decisions about these two funds.

Both the N.C. House and Senate have named a conference committee to negotiate the final budget for 2009-10. The House budget only provides $25 million for the CWMTF, a 75 percent reduction from previous years and $2 million for AFPTF, a 50 percent reduction. The budget passed by the Senate includes $95 million for CWMTF and no funding for AFPTF.

Received 17 July 2009
From info@landfortomorrow.org
Subject: "A message to our supporters"

Dear Land for Tomorrow Supporters:

Thanks to your action, nearly 2,000 messages were sent to members of the General Assembly over the past week urging their support of adequate funding for the Clean Water Management Trust Fund and the Agricultural Development and Farmland Preservation Trust Fund. We are so very appreciative of your efforts communicating with lawmakers to help protect our state's land and water.

We wanted to share a letter with you from an important Land for Tomorrow partner, the United States Marine Corp. This week, U.S. Navy Captain and Chief of Staff J.D. Voltz urged Governor Bev Perdue and members of the General Assembly to continue supporting North Carolina's Trust Funds. Since 2001, the Marine Corps, the state of North Carolina and conservation organizations have worked together to conserve more than 46,000 acres of land that also helps to buffer Marine Corps ground and air training space.

For budget year 2010-2011:

Received 4 May 2010

From info@landfortomorrow.org
Subject: "Action Alert: Join us in thanking Governor Perdue for recognizing the economic benefits of conservation!"

Governor Bev Perdue released her recommended state budget adjustments last week, and she kept intact the current $50 million appropriation to the state's Clean Water Management Trust Fund. The appropriation is a vital commitment to conservation, which is an economic engine for many areas that have been hit hard by the economic downturn.

Now that Governor Perdue has released her recommendations, it's up to the Legislature to maintain the funding. There are dozens of quality projects waiting in line for funding from CWMTF. For its investment in conservation, the state would receive an incredible economic return.

Received 9 June 2010
From info@landfortomorrow.org
Subject: "Action Alert: Thank your legislators for conservation funding in budget proposals"

We need your help!

The NC House and Senate have approved their budget proposals for the upcoming fiscal year, and the two plans have now been sent to a conference committee to work out the differences.

We are very pleased with the support and funding recommended for the Clean Water Management Trust Fund (CWMTF). In both the Senate and House budgets, CWMTF received $50 million for FY 2010-11, which begins July 1. In addition, the House budget includes $2 million for the Agricultural Development and Farmland Preservation Trust Fund (ADFPTF),but no funding was included in the Senate budget.

As the conference committee begins its work this week, please contact your legislators and thank them for the House and Senate's strong support of the CWMTF, and urge them to include $2 million for farmland preservation in the final budget proposal.

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