

The Builders versus the Birds: Wetlands, People and Public Policy in the United States,
Florida and Hillsborough County

By

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ABSTRACT

This thesis is an interdisciplinary analysis of humans' relationship to the natural environment, specifically how wetlands are reflected in our legislative decisions. Our perceptions of wetlands and our relationship to the environment are influenced by our locality, history, and inter-generational relationships. These perceptions shape decision-making within a community. Our relationship to the natural environment and the way we interact with it can be explained through psychological and geographical theories.

Historical trends reveal our consistently negative perspectives of wetlands in the United States and a rapid decline in wetlands acreage. At the federal, state, and local level, Americans have attempted to agree upon regulations that protect both essential wetland functions and private property rights. Literature, academic discourse, newspaper articles, local voices, county employees, and legislation help reveal the relationship between perceptions of wetlands and the regulations that affect these ecosystems.

Hillsborough County's wetland controversy exemplifies a debate between differing public attitudes toward wetlands similar to that seen across the state and country. Pressure from landowners and developers encouraged the Hillsborough Environmental Protection Commission to vote to eliminate the county wetland protection division in the summer of 2007. Public concern following this decision led to debate

about the significance of local wetland regulations. The decision to eliminate the wetland protection division was placed on hold for further discussion. In the first four chapters I examine the historical, social and psychological roots of our relationship to wetlands. Then, chapters five and six address wetland regulations on the federal and state levels. Chapter seven is a case study of Hillsborough County's wetlands controversy that arose in summer 2007 with a commission vote to do away with the county wetlands protection. Finally, in chapter eight I attempt to bring together all sides of the wetlands conversation into towards finding a solution to what position county governments should take in regulating wetland impacts and use.

Chapter 1

Introduction: Wetlands in America

History, culture, science and politics surrounding wetlands have been a part of public discourse in the United States since the colonial era. Wetlands are places where the substrate is at least occasionally saturated, specially adapted plants thrive, and a unique set of life is supported. Without wetlands many species that rely on them for food and habitat would become endangered or extinct. Beavers, alligators, and wood storks are just a few examples of wetland animals that were nearly eliminated from the U.S. While many former wetlands are now agricultural and urban developments, the wetlands that remain play a valuable role in providing ecological and socioeconomic benefits. Because wetlands benefits extend across regional, state, and even national boundaries, regulatory discourse has become increasingly complicated. In this thesis, I examine historical perceptions of wetlands and the wilderness philosophies that encouraged these perceptions. I will also examine wetlands regulations on a variety of spatial scales: national, state, and county levels, and the interactions between the various regulating bodies.

A wide range of wetlands can be found in the United States from permafrost underlain wetlands in Alaska to portions of tropical rainforests in Hawaii and riparian wetlands in the arid southwest. Once viewed as an obstacle preventing productive land use, the value of wetlands has only recently been recognized. Wetlands provide fish and wildlife habitats, protect shorelines from erosion, maintain ground water supplies and

water quality, store floodwaters, trap polluting sediments, and modify climate. Yet the continental U.S. lost 53% of its wetlands between 1780 and 1980.¹ Roughly sixty acres of wetlands have been lost every hour for the past two centuries.² Environmental and socioeconomic benefits provided by wetlands are now seriously threatened.³

A number of theoretical concepts attempt to explain humanity's relationship with nature. Our relationship and interactions with nature influence the collective decisions we make that affect the environment. The bond between humans and the environment influences people's interactions with their surroundings. Proximity, life experiences, cultural messages, and education all impact our relationship with wetlands. People perceive wetlands in a variety of ways including profitability, recreation, aesthetic appeal, or plain distaste. Regardless of which response a person has to wetlands and other wild areas, there will always be an innate physical and mental attachment to our natural surroundings. Furthermore, people will always be dependent on nature and the resources and functions natural areas offer. Wetlands are certainly vital natural areas that offer humans a number of beneficial values and functions, and our relationship with these areas impact the way our society chooses to regulate their use.

The various perceptions of wetlands and wetland uses also play a vital role in the discussion of wetlands regulations across the nation. Historical perspectives of wetlands shape our attitudes toward decision-making that affects wetland ecosystems. Memoirs, literature, academic discourse, and legislation reveal the trends of attitudes toward wetlands over the last few centuries. Wetlands have long been an appealing theme for American writers and naturalists. Historically, our cultural attitudes towards these ecosystems were overwhelmingly negative. While some Romantics and other literary

figures of the nineteenth and early twentieth centuries have advocated conservation and preservation, a strong environmentalist movement recognizing the important values and functions of wetlands did not emerge until well into the twentieth century. The changing trends in perspectives toward wetlands have shifted from swamps in need of draining to sensitive ecosystems in need of preservation.

A pivotal moment occurred in 1849 when the federal government passed the Swamp Lands Act encouraging agriculture and development by transferring federal wetlands into states' hands. This transfer was the first time the federal government played a significant role in the fate of wetlands. By the 1930s, Americans witnessed the apparent impacts wetlands conversion had on wildlife. People also began to understand the values these ecosystems offered. Concerned Americans pressured the federal government to switch gears and focus on protecting wetland habitats and wildlife. The U.S. Army Corps of Engineers was directed to enforce the wetlands permitting program under the Clean Water Act of 1972. Ironically, the Corps became responsible for protecting the same wetlands they previously helped drain, dredge, and fill. Conflict continued between developers and environmentalists regarding the Corps' success, or lack thereof in enforcing the permit program. Indeed, the federal government's inadequate protection of wetlands led 35 states to establish some form of state level wetlands protection program.⁴ Still, many wetlands remained inadequately protected.

Suffering a nine million acre loss of wetlands mostly since 1900, Florida serves as a prime example of the increasingly complicated state of wetlands policy-making. The rain and temperate climate has long been ideal for an abundance of plant and animal life, and the mostly flat surface of Florida contributes to the accumulation of water forming

wetlands. Florida's landscape endured only modest human impacts prior to the late nineteenth century, as Native Americans were few in number. It was not until Governor William Bloxham, Hamilton Disston, Henry Flagler, and other leaders of the Gilded Age that development projects in Florida during the 1880s began to threaten wetlands and the values they provide.⁵ Federal, state, and local environmental regulations have protected Florida's fragile environment since the 1970s. Indeed, the Florida legislature created five water management districts in 1975 and blessed four of them with state-level wetland permitting authority.

As the benefits of wetlands and their mass destruction became increasingly understood, many county governments stepped in to further ensure protection of wetlands. A prime example in Florida is in Hillsborough County. In a state that was once comprised of about 20 million acres of wetlands, federal and state wetlands protection did not satisfy Hillsborough County's people who created the Environmental Protection Commission (EPC) in 1967, which later added a Wetlands Management division. Indeed, twenty of the sixty-seven counties in Florida now have their own wetlands rules.⁶ Yet conflict erupted in Hillsborough County during the summer of 2007. The County Commission initially tried to shut down the wetlands division of the EPC, but public outcry halted that effort.

In this thesis, I will address American academic and political discourse about wetlands, the cultural foundations of the wilderness dichotomy, the history of wetlands perspectives in the United States, and the federal, state, and local roles in regulating the use of wetlands. The focus of my thesis will be a case study of the 2007 controversy that arose in Hillsborough County, Florida when County Commissioners initially voted to do

away with the EPC's Wetlands Management Division. What protection did the County program provide that state and federal governments did not provide to wetlands in Hillsborough? What were the motives of commissioners who attempted to kill local wetlands protection? Why was there such outrage from the public and certain commissioners about the decision? In addition to answering these questions, I will report on where the wetlands management division of Hillsborough County stands today. I hope to offer a unique perspective that combines academic discourse across disciplinary boundaries regarding wetlands and which sheds light on humanity's relationship to the environment.

Chapter 2

Wetlands: Definitions, Classifications, and Functions

Until the mid-1970s wetland policies in the United States aimed to fill and drain wetlands for urban and agricultural development. With over 50 percent of the nation's original wetlands converted to other purposes by this time, a heightened concern for wetlands losses led to political support for protecting wetlands.⁷ Mounting public concern and political involvement led to environmental protection policies that encompassed wetlands throughout the United States as early as the 1970s. Wetlands are the only ecosystems comprehensively regulated across public and private lands in the United States.⁸ A complete, scientifically sound definition of wetlands is important to both government agencies who regulate land use and to the public whose understanding of the values wetlands offer is crucial.

The term *wetlands*, first publicized in a 1956 U.S. Fish & Wildlife Service report, a bulletin published in response to a rising concern over losses of wetlands.⁹ There is no all-inclusive definition for wetlands, only interpretations and delineation guidelines. Wetland ecosystems are best understood as the transition zone between an elevated upland and a lower lying deepwater environment. It is in this transition zone that a unique array of plant and animal species thrive. The act of delineation is the determination of specific boundaries around wetlands, generally for legal or regulatory purposes. Yet a high level of variability from one wetland area to another further

complicates the process of determining one universally accepted definition. A clear-cut definition is important for consistent rule enforcement and delineation. Three federal regulatory agencies have developed distinct definitions of *wetlands*: the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, and the Soil Conservation Service (now called the National Resources Conservation Service). All three agencies rely on similar research and scientific data to define wetlands, but they have somewhat different primary responsibilities and histories. Although it is not perfect, the definition used by the U.S. Army Corps of Engineers offers a reasonable point of departure. According to the Environmental Protection Agency and the Army Corps of Engineers, wetlands are “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.”¹⁰

A number of landscape issues shape and characterize wetlands. Because it takes such a wide array of cross-disciplinary knowledge to properly apply the definition of wetlands in the field, federal agencies develop extensive manuals for delineation purposes. Every widely accepted definition of wetlands includes three main components: (1) the presence of water: hydrology, (2) the presence of flood-tolerant vegetation: hydrophytes and (3) the presence of unique soil conditions: hydric soils. Along with the federal government, many states including Florida use indicators of these three characteristics to identify and delineate wetlands.¹¹ While hydrologic conditions can sometimes be a clear-cut sign of wetlands, the hydrology of an area can vary greatly throughout the year and from year to year. For this reason, the presence of standing

water observed during one site visit cannot stand alone as a single reliable wetlands indicator. The presence of hydrophytes and hydric soils are also important indicators used when defining and delineating wetlands. The three factors analyzed together can provide an adequate representation of an area.

Wetlands hydrology is generally characterized by water that is at or just below the surface during the local growing season. The frequency, duration, depth, and timing of wetness—collectively referred to as the hydroperiod—are the hydrologic characteristics considered when defining wetlands.¹² These four hydrological factors influence the plant and animal life, soil characteristics, and wetland functions. It is sometimes difficult to determine an area's hydrology because conditions can vary greatly from year to year, during different times of the year, and even day to day. Wetlands in general also vary greatly from region to region. Oftentimes, an area must be studied over a long period of time, sometimes over a century to adequately characterize its hydrology. Most wetlands possess very dynamic water flows and levels dependent on the time of year, location, and past and current soil conditions. For example, a coastal marsh may experience daily flooding with each high tide, while a river swamp may experience seasonal flooding.

Flood frequency refers to how often prolonged wetness occurs in a given area. The standard determination of frequency is based on the number of times saturated conditions exist in an average year—taking into consideration variations from year to year and allowing for extremely dry and extremely wet exceptions. The frequency requirement in the United States sometimes leaves out arid and semiarid areas from wetlands regulation even if they may have cyclical periods of wetness. This further supports the idea that plant and soil characteristics must be considered because the

presence of moisture is often an insufficient basis for wetland determinations. Just because an area does not appear to be wet when examined, does not mean the area is not a wetland.

The duration of flooding represents an important issue in wetlands because if places are flooded long enough, anaerobic (oxygen-less) conditions can occur. This is important because plant roots need access to oxygen. With scientific evidence suggesting anaerobic conditions can occur anywhere from one day to one month after flooding, the National Research Council concluded that fourteen consecutive days of flooding would generally produce a wetland environment. Wetlands need not experience standing water to produce anaerobic conditions in soil. Most all root systems of wetlands vegetation are found no more than four feet below the surface and most often occur within the upper one foot of soil.¹³ Therefore, if soils as much as a foot below the surface become saturated, only plants capable of coping with the resulting anaerobic conditions in the root zone can flourish.

The timing of the wetness is critical, as the conditions of the growing season determine what vegetation will be found in an area and what vegetation will not. In federal regulations, the growing season refers to the period of time for germinating and growing cultivated crops. This has typically been defined by the frost-free period of a region with thresholds from 28°F to 32°F. In central Florida, the growing season persists from the last freeze in spring (on average January 31) to the first freeze in fall (on average January 8) of the following year. Central Florida's growing season is thus 342 days out of the year.¹⁴ If flooding occurs when plants are not growing—the excess water

does not harm them. But, saturation during the growing season causes stress on plants, limiting the species that can survive.

Because the hydrology of an area can be so varied, one way to determine wetlands conditions is if the hydrology and soils support hydrophytic vegetation.

Hydrophytes are plants that can tolerate flooded and anaerobic conditions at least some of the time. Some hydrophytes compensate for anaerobic conditions by rapid stem growth or oxidizing rhizospheres.¹⁵ Oxidation of rhizospheres in hydrophyte is the process of releasing excess oxygen through the roots into the surrounding anaerobic environment.¹⁶ This aids in oxidizing toxic materials within the soils. Others have raised root systems or adventitious roots (roots just at the water surface) to access oxygen above the anaerobic soils. Developing airspaces in roots and stems, seed production during dry season, production of floating seeds, and occupying wetlands that are flooded during the cold, non-growing season are other ways hydrophytic plants avoid flooding stress.

Hydrophytic species are important in the process of classifying wetlands because to the untrained eye, an abundance of moisture-absorbing plants may give a misleading impression of an area's water table being lower than it is. An example of this would be an area with extensive tree cover keeping an area drained through transpiration, which might otherwise be flooded.¹⁷ Also, the vegetation can change from the wet areas of wetlands outwards to the drier borders, complicating delineation. On the outskirts of wetlands, the typical hydric species intermix with mesic species making the boundary unclear. This goes to show that all characteristics of an area must be examined in relation to one another before making a final determination, as they all go hand in hand.

To ensure accurate delineation and identification of wetlands, the federal government has developed a list of vascular plants that occur in wetlands. These species vary from plants that can tolerate saturated soils for a few weeks to those that can tolerate standing water for several months. Wetland scientists often classify plants into one of five different categories. Obligate wetland plants are found more than 99% of the time in wetlands. Facultative wetland plants are usually in wetlands and Facultative plants are found in wetlands half the time. Meanwhile, Facultative Upland plants are only occasionally found in wetlands and Upland plants are almost never found in wetlands. Obligate wetland and Facultative wetland plants are generally accepted among scientists as indicators of wetlands.¹⁸

Soils are important to defining wetlands because the nature of soils affects plant growth and peat deposits, and they can be especially helpful in identification where much of the vegetation has been removed. Hydric soils are most often found in depressions and flat plains that do not have drainage outlets and they may be created by outside factors such as beaver dams and human construction. The foul smell often found in wetlands is due to these anaerobic conditions, specifically, the accumulation and release of carbon dioxide, nitrogen, hydrogen, and methane gases. Soils are composed of mineral and organic materials, liquid, and gases that occur near the land surface. The anaerobic conditions of hydric soils greatly reduce the ability of oxygen breathing microbes to decompose organic matter. Fluctuations in the amounts of the constituents result in additions, losses, transfers, or transformations of energy over time and the ability to support plants with root systems in their natural environment.¹⁹ Hydric soils are saturated or flooded long enough during the growing season to develop anaerobic

conditions in the root zone. In flooded soils, microbial respiration quickly uses up the available oxygen, creating an anaerobic environment.

Some wetlands are hard to identify because the plant species, soil characteristics, and hydrology are difficult to classify with precision. This is partially due to human effects on wetland plant distribution. Human disturbances and interference can drastically alter the presence of indicators. It is hard to tell which plants would naturally grow if the agricultural or silvicultural species that now occupy an area were to be removed from an altered piece of land. Ralph Tiner suggests that “the 20th century landscape can be a most confounding ecological expression to decipher due to the great impact of urban development, agricultural and grazing practices, and natural resource management.”²⁰

Once an area has been designated as a wetland, it can be further classified as a specific type of wetland. Classification of wetlands is important for conducting inventories, watershed planning, assessing biodiversity, evaluating wetland functions, and assessing alteration, degradation, and restoration impacts, among other issues. The United States Geological Survey groups wetlands into three categories: “(1) areas with hydrophytes and hydric soils (marshes, swamps, and bogs); (2) areas without soils but with hydrophytes (aquatic beds and seaweed-covered rocky shores); and (3) areas without soil and without hydrophytes (gravel beaches and tidal flats) that are periodically flooded.”²¹ The USGS classification takes into account the variations due to alterations of wetlands, assuming the presence of two of the three factors: hydrology, hydrophytes, and hydric soils can imply the third is or once was present. Tiner introduces two types of classification systems, horizontal and hierarchical. Horizontal wetlands classification

divides habitats into a series of classes or types. Examples of horizontal classifications include bogs, marshes, swamps, and flatwoods. Hierarchical classification uses a set of matrices that include lower levels of wetlands that share only general characteristics of wetland vegetation, substrate, and hydrology to higher levels of wetlands that share more detailed and exemplary vegetation, substrate, and hydrology wetland characteristics.

The U.S. Fish and Wildlife Service reorganized their wetlands classification system in 1979 to prepare for a national wetlands inventory. The new system groups ecologically similar habitats before judging the value of a wetland, furnishing habitat units for inventory and mapping, and ensuring uniformity in concepts and terminology for classification across the United States. The new classification system, *Classification of Wetlands and Deepwater Habitats of the United States* by Lewis Cowardin, et al., is widely used by governmental agencies, universities, and private and non-profit organizations for identification and classification of wetlands.²² This system includes five main types of wetlands. Marine and estuarine wetlands have connection to the ocean; riverine wetlands are found near rivers and streams; lacustrine wetlands near lakes; and palustrine wetlands near smaller inland water bodies. Marine and estuarine systems are saltwater wetlands while the latter three are freshwater systems. These five systems are further organized into classes, subclasses, and dominance types. This classification system examines an area's vegetation, water chemistry, hydrology, origin of water, soil types, landscape, size, and ecosystem and energy sources.

Over the next 20 years, government scientists and regulators prepared a series of different wetland identification manuals. In 1993, Congress requested that the Environmental Protection Agency ask the National Research Council to assess the

adequacy and validity of wetland definitions, the delineation methods, present knowledge about wetlands, and the regional variation of wetlands. This request was triggered by the constant preparation, criticism, withdrawal, and amendments of various federal agency manuals addressing wetlands definitions and regulations. The criticized legislation promoting federal manuals included the Clean Water Act amendment to the 1977 Federal Water Pollution Control Act, the U.S. Army Corps of Engineers (Corps) 1987 Corps manual, the 1989 interagency manual, and the 1991 proposed revisions to the 1989 federal interagency manual.

The National Research Council (NRC) committee concluded that the 1991 proposed revisions would greatly reduce the amount of protection given to wetlands in the 1987 and 1989 manuals. The NRC saw the importance of having a definition of wetlands that stands alone, with no agency or policy connection. Their reference definition of wetlands serves as a contrast to definitions associated with specific regulatory or legislative practices. The three themes of the 1995 NRC report are wetland identification and delineation, functions and values of wetlands, and variations among wetlands. The relationship between these themes is seen in manuals and legislation throughout the federal agencies. The NRC reference definition is as follows:

A wetland is an ecosystem that depends on constant or recurrent, shallow inundation or saturation at or near the surface of the substrate. The minimum essential characteristics of a wetland are recurrent, sustained inundation or saturation. Common diagnostic features of wetlands are hydric soils and hydrophytic vegetation. These features will be present except where specific physiochemical, biotic, or anthropogenic factors have removed them or prevented their development.²³

In this reference definition, the three major factors characterizing wetlands are water, soil, and supported plant life. The NRC also puts stress on the possibility that an area of

wetlands has been so drastically altered by outside influences, that one or all of these factors may not be apparent. The identification factors used by NRC revolve around an area's hydrology reflecting recurrent, sustained saturation conditions.

Wetland identification and boundary delineation methods have been established by a number of federal agencies, each with their own wetlands definition. With each agency having different purposes and missions, the definition of wetlands plays a different role in each of the agency's agendas. The Corps enforces the Clean Water Act passed by Congress in 1972. The U.S. Fish and Wildlife Service manual focuses on the goal of protecting wildlife found in wetlands. The Natural Resources Conservation Service (previously the USDA Soil Conservation Service) wetlands manual is focused on in wetlands in terms of their relationship to agriculture. The need for wetland identification and delineation techniques arose with the evolution of conservation and preservation laws passed to protect wetlands and water resources. Because private property is such an important right of Americans, and public land is a shared treasure of the American people, regulatory practices including land use control need to be consistent. Prior to the development of federal wetlands delineation manuals, wetlands were mostly identified by scientists using indicator plants and plant communities. Recent federal definitions include the soil and hydrology characteristics of wetlands along with the presence of certain plant species.

Ralph Tiner criticizes the wetland regulations enforced by Corps (created in order to carry out the intent of Section 404 of the Clean Water Act passed by Congress) arguing that they fall short of the NRC standards. Tiner contends that while the NRC suggests that farmed wetlands are flooded up to 10 percent of the average growing season, the

Corps' 1987 manual limits the wetlands hydrology threshold to 5 percent of the average growing season.²⁴ The NRC concluded in 1995 that "wetland hydrology should be considered to be saturation within 1 ft of the soil surface for 2 weeks or more during the growing season in most years (about every other year on average)."²⁵ It is within one foot of the surface that most root systems would be affected by saturation. The Corps similarly uses a 12-16 inch saturation depth (and under 6.6 feet which is the depth used to classify a body of water) in wetland delineation.²⁶

The U.S. Fish and Wildlife Service's (FWS) definition of wetlands includes swamps; freshwater, brackish water, and saltwater marshes; bogs; vernal pools; periodically inundated saltflats; intertidal mudflats; wet meadows; wet pastures; springs and seeps; portions of lakes, ponds, rivers and streams; and all other areas which are periodically or permanently covered by shallow water, or dominated by hydrophytic vegetation, or in which the soils are predominantly hydric in nature. The FWS definition is a non-regulatory, technical definition geared toward wetlands protection and scientific investigations. FWS calls wetlands "lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification, wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports hydrophytes, (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year."²⁷

The National Resources Conservation Service's (NRCS) definition was developed in response to the Swampbuster provisions of the 1985 Food Security Act. As long as a

piece of property is used for agricultural purposes, the Swampbuster provisions require that the NRCS delineate wetlands on the property to determine mitigation requirements.

The NRCS defines wetlands are defined as:

lands that have all of the following characteristics:

- (i) A predominance of hydric soils.
- (ii) Are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions.
- (iii) Under normal circumstances support a prevalence of hydrophytic vegetation.

Exception: Lands in Alaska identified as having a high potential for agricultural development and a predominance of permafrost soils shall not be considered wetland for purposes of the Act. (7 CFR 12.2)²⁸

Aside from a few short comings, all three agencies acknowledge the relationship between an area's hydrology, soil, and vegetation to a recurrent, sustained saturation condition encouraged in the NRC publication. These definitions and the differences between these three federal agencies become increasingly important when they are viewed in light of regulatory practices. While this chapter focuses primarily on characterizing wetlands, the federal role—specifically that of the Army Corps of Engineers in wetlands delineation, protection, and destruction—will be discussed in more detail in chapter five.

Despite regulatory agencies and permitting practices that are supposed to limit interference with natural wetlands, these environments continue to be degraded. The dredging, destruction, and altering of wetlands has led to demands for well-regulated and effective policies at the federal, state, and local levels. Aside from aesthetic values of wildlife and natural enjoyment, wetlands serve a number of ecological, biological, and hydrological functions that are of value to humans and other life forms. In their extensive

account of wetlands, William Mitsch and James Gosselink remind us that the term *value* casts wetlands in an anthropocentric light: how do wetlands benefit humans?²⁹ The idea that the term *value* is anthropocentric is apparent in the legislative decision-making regarding wetlands delineation, regulation, conservation, and preservation. The National Research Council groups wetland functions into three categories: hydrologic, biogeochemical, and habitat and food web support.³⁰ Critical functions and values include storm abatement along coasts, flood control, water quality, and habitat and ecosystem sustainability. It is important to understand that a single wetland and its values are not limited to the wetland itself, but play a role in the larger hydrologic systems of the region, continent, and world. For example, many animals feed in wetlands but spend much of their lives in neighboring uplands. The destruction, manipulation, and degradation of wetlands has led to a loss of functions burdening people with costs such as controlling floods and treating water.

Wetlands are an important component of many watersheds because they help reduce flood peaks and maintain base flows and seasonal flow distribution in moving water bodies. Wetlands around rivers and streams play a major role in flood control by absorbing excess waters. Natural wetlands often recover quickly after storms, suffering little long-term damage. In floodplains, wetlands absorb flood waters and slow down the release of water into the river and watershed system. This prevents flash flooding that would be caused by storm or flood waters flowing downstream. In areas where wetlands have been eliminated, flood waters discharge more rapidly than flood waters in an area of wetlands. Of course a wetland's ability to store flood waters is reliant on the topography, size and depth, antecedent soil conditions, type of soil, and temperature below the

surface. While some wetlands serve as places for ground water discharge to the surface, others provide a place for surface water to recharge the ground water supply. The societal values from the effects of hydrologic systems in wetlands include maintenance of biodiversity and fish habitat during dry periods.³¹

The biogeochemical functions of wetlands include transformation and cycling of nutrients, retention and removal of dissolved substances, and accumulation of peat and inorganic sediments. Some wetlands serve as a sink for nutrients and sediments while others transform nutrients into other forms. Some nutrients are simply removed from water by attaching to sediment particles that settle at the bottom of wetlands. Nitrogen and phosphorous are two nutrients commonly found in waste water and absorbed by plants in wetlands. Biogeochemical functions ensure nutrient stocks within wetlands and reduce the transport of nutrients downstream. By retaining these nutrients, not only are they available within wetlands to support plant growth, but the downstream water quality is improved. By retaining inorganic sediments, wetlands further provide additional natural filtering for increased water quality.

In addition, wetlands offer ecosystem sustainability by supporting food webs and providing habitat for a number of species, including some endangered and threatened species. By supporting hydrophytic plant communities, wetlands offer food, nesting and cover for animals including furbearers and waterfowl popular with the hunting community. Migratory waterfowl rely on North America's wetlands in four major flyways.³² Unfortunately, the decrease in the amount of wetlands has led to a decrease in the waterfowl population. The decrease in wetland areas has also led to an increase in the spread of avian diseases due to fewer available resting places within the migratory

flyways. In addition, fish, shellfish, and other seafood resources we rely on are dependent on wetland habitats. A constant energy flow within wetlands also supports a number of vertebrates maintaining biodiversity and a significant food web. A bio-diverse community is important to beneficial natural processes such as nutrient cycling and maintaining water quality. Finally, there is a strong interdependence between wetlands and their neighboring upland and aquatic environments.

Another function many people can appreciate is the aesthetic and recreational value wetlands offer us. Wetlands contain unique vegetation, a direct contrast to terrestrial and aquatic surroundings, and greater biodiversity. As far back as Henry Thoreau, William and John Bartram, James Audubon, and John Muir, Romantics and nature-lovers have placed value on the sheer beauty of natural wetlands. Others rely on wetlands for recreational uses such as kayaking, hiking, and bird-watching. Culturally, wetlands preserve archeological evidence of past societies and serve as a place of inspiration for artists, poets, and writers.

Destruction, manipulation, and degradation of wetlands has led to a loss of functions burdening people with large costs to control floods, treat water, and protect endangered species. The National Research Council concludes: “when wetlands are removed, their collective functions are likely to decrease faster than the rate of reduction in surface area.”³³ Past perceptions of wetlands as disease-ridden and bug infested bogs have led to a number of wrong turns in wetlands management for which we are now paying a hefty price.

Chapter 3

Wetlands, Wilderness and the Human-Nature Bond

The philosophical development of humanity's relationship to nature over the course of United States history is vital to understanding wetlands as a wilderness environment, regulated, managed, and debated in American politics and legislation. Humanity's relationship to nature impacts our view of nature, thus having a direct influence on how we will solve our modern ecological and environmental problems. The evolution of the idea of wilderness in western society explains the changing attitudes toward wetlands in the United States and the twentieth-century emergence of environmentalism. Wetlands have been a part of American culture since the colonial era when they were largely viewed as dismal and unhealthy swamps and bogs. While the cultural attitudes expressed in the literary discourse of early Americans have often been negative toward wetlands, merely having these views expressed in popular literature provides evidence of the longstanding relationship between Americans and wetland environments.³⁴ This chapter first addresses the human-nature bond, and then examines the idea of wilderness in a cultural context. Finally, this chapter addresses the two theories of topophilia and biophilia as possible explanations for how and why we have developed stereotypes for natural environments throughout history. The bond humans have with nature impacts our view of wilderness. Our views of wilderness then influence our decision-making regarding natural environments such as wetlands. The discussion of

wilderness sheds light on some of the deeper, cultural meanings behind management and policy debate regarding natural areas. Through understanding wilderness and the human-nature bond, this chapter functions as the cultural, philosophical, and psychological foundation of the thesis. I hope to emphasize a deeper, cultural meaning in the public discourse influencing wilderness and wetland policy-making, historically and currently flooded with politics, economics, and science.

The idea of wilderness is a cultural concept imbedded in the particular culture defining it.³⁵ In western society, wilderness is traditionally defined as the other, all that is not human—natural landscapes, wildlife, and natural disasters typically fall within this definition. An understanding of western perspectives of nature and the human-nature bond provides substance and layers to the cultural meaning of wilderness beyond ecological and biological functions, and beyond prospective economic worth. There is an ever-lasting and undeniable cultural bond between Americans and their environment. Gordon G. Whitney suggests that this bond is based on the simple fact that humans rely on the earth to survive and are “superimposed upon its natural features.”³⁶ We have to find a way to relate to the natural environment because it is not only our home, we rely on its resources to maintain our livelihood. Understanding the evolution of the idea of wilderness and the evolving relationship humans have with their environment—and equally important—*why* we have this undeniable relationship, are fundamental ideas to our understanding of environmental policy in the United States.

Edward O. Wilson added *Consilience* to the academic lexicon in 1998.³⁷ Wilson argues that unlike animal sociality, human social existence is based on our genetic propensity to form moral precepts and laws. This occurs through the gene/culture co-

evolution. According to Wilson, culture is a super-organism that evolves on a track parallel to natural selection.³⁸ With this in mind, it will take the entire nation world bringing together knowledge to find the solution for our increasingly inadequate food and water supplies, polluted land and water, and diminishing natural resources. *Consilience* stresses a bond between the four major disciplines that impact our understanding of life: environmental policy, ethics, social science, and biology. With the unity of physical, natural, and social sciences (through consilience), humanity will have the tools to recover from the human-induced destruction of the natural world and regain moral sentiments that Wilson argues are embedded in our genes. This is possible by crossing disciplinary boundaries and unifying research findings in an interdisciplinary setting. Viewing culture as a super-organism also helps explain our propensity towards preserving nature. There seems to be an emerging public belief that humans are inflicting irreversible damage to natural environments. This is evident in the increasing number of environmental organizations in the United States and their impact on political decisions over the past century.

The same genetic morality embedded in the culture super-organism can be examined on an individual basis as well. Kay Milton argues that every individual is a product of their environment, and interactions with the environment shape each person's perspective.³⁹ Every experience triggers some form of an emotional reaction and our awareness of these reactions motivates our actions. Therefore, while human experiences are based on direct relationships between an individual and the environment, our environmental actions are products of our emotional reaction to these very experiences within the environment. Through the realization that emotion drives rational thought,

public discourse will lead to stronger decision-making in regards to nature and natural things. Milton contends that “[all] commitments are fundamentally emotional, without emotion there is no commitment, no motivation, no action.”⁴⁰ This argument can be directly applied to political action over the course of America’s environmental history. This will become increasingly evident in the following chapters of this thesis where I examine wetlands policy and the cultural attitudes that have encouraged legislation and enforcement of wetland protection laws.

The meaning of wilderness has a strong, cultural context in Western and particularly American society. Westerners have historically viewed the wild as the other, non-human components of the world. Modern perceptions of nature have also been skewed by the biblical interpretations of wild as satanic and beastly. Wilderness was once the antithesis of everything good and orderly, and modern society clung to this idea by dominating and managing everything we call natural.⁴¹ To understand Americans’ modern idea of wilderness, we must look back to the first humans and their encounters with nature, and to the cultural influences that impacted our European ancestors.

The idea of wilderness dates back to Paleolithic peoples; or rather, that the Paleolithic peoples had *no* idea of wilderness.⁴² Paleolithic peoples were hunter/gatherers of the Pleistocene era who viewed the world and survival as a game. They were players in a game where they loved, not hated, their opponents. They viewed hunting as a gift, the life they killed as a gift of life, and their own lives as a gift. They used plants and animals to develop symbolic thinking. There was no hiding of birth, death, butchering, or other facts of life. Children were able to understand life at an early age without age-restricted events like birth and death. They were a transient species

focused on place rather than space. Killing an animal was a sacred gift of food, not a sacrificial loss. Pleistocene people cherished their relationship with animals and the nonhuman world.⁴³

Ten thousand years ago, the first Agricultural Revolution formed the basis for human civilization and paved the way for the modern view of wilderness. The Agricultural Revolution was significant because it led to sedentary villages, an anthropocentric view of the world, and patriarchal cultures. This differed dramatically from the Paleolithic hunter-gatherers who lived a more balanced existence with other life, leaving an area as food supplies became scarce. The agriculturalists on the other hand lived a sedentary life and domesticated animals and plants to maintain and control food supply.⁴⁴ Manipulation and extraction of resources from the land led to human reliance on crops for survival, steering away from the hunter-gatherer lifestyle. The domination of land led to the competition for property because of the increased demand for large units of property for farming and livestock. The increased competition for land played a vital role in the cultural perspective of nature. Notions of private property and land ownership eventually emerged and prevailed over the old hunter-gatherer nomadic mentality. Nature became separate space and humans viewed themselves as masters and manipulators of the natural world. Wilderness became a place absent of human settlement.⁴⁵

The Judeo-Christian mindset is also argued to play a significant role in Western views of wilderness and nature. Early Greeks and Christians viewed the soul as independent from our bodies and in an eternal realm of existence. The soul was recognized as the intellect and personality. This is significant to the developing views of

nature because it places an eternal existence separate from the natural world; humans, as soul-bearers, became separate from the natural world. According to this view, there is the supernatural and the natural; the sacred and profane. This dualism fostered the idea of a Heaven separate from earth.⁴⁶

The mainstream recovery narrative of Judeo-Christian belief is based on the biblical, linear story of the fall of man from the Garden of Eden found in Genesis. Prehistoric religions were polytheistic with animal and fertility idols. Yet as the idea of exploitation of wilderness expanded, monotheistic supernaturalism emerged. The monotheistic belief system that formed the base of modern Judeo-Christian beliefs emerged around the time of the Kingdom of Israel between 1000 and 700 B.C.E. The Hebrews believed they were the chosen people of Yahweh (Hebrew for God) meant to occupy the land.⁴⁷ Their ideas of nature ultimately molded into the belief that land was useless unless it was used by humans.⁴⁸ The Old Testament rejects nature gods and mythology and contends that nature has no importance outside of serving human needs. Also, God, or Yahweh in the Old Testament is entirely outside of nature. These ideas set humans apart from nature and continue to justify the manipulation and use of the environment. The Judeo-Christian belief is that God gave man dominion over the earth. The Old Testament also desacralizes nature and states that humans have claim on the land. Genesis in particular justifies human manipulation and anthropocentrism placing humans separate from nature and free from nature idolatry.

In Genesis, humanity fell from the Garden of Eden following Eve's temptation to eat the fruit of the tree of knowledge. Genesis starts with God creating everything. The story says that God created man from dust: Adam or *adama*, which is feminine, means

“earth that gives birth to plants.”⁴⁹ God created Eden, including the tree of knowledge of good and evil. God created Eve from Adam’s rib. Humans were told to “dress and keep” Eden, and “be fruitful and multiply.” Yet, Eve is ultimately tempted by a serpent in the garden and she consumed the forbidden fruit God said to avoid. Adam follows suit and the couple is expelled from the Garden. This represents the loss of innocence and Eve becomes “wife” and “mother of all the living.”⁵⁰ Adam and Eve’s sons Abel and Cain become pastoralist and farmer, respectively. Humans were forced to adopt a labor-intensive way of life and nature became seen as acting through God in response to human sins.⁵¹

Before the fall, nature was a positive presence. After Adam and Eve disobeyed God, nature became a condemned and fallen land. The Recovery story believed by some modern Christians starts with the Fall of Eden into the desert, moves upward to the recreation of Eden on earth, and ends with heavenly paradise, a recovered Garden on Earth.⁵² This belief contends that humanity can be redeemed through Christianity, the Garden can be recovered, and when merged with advances in science, technology, and capitalism the fall of Eden will be followed by a long, slow, process to recreate the Garden on Earth.⁵³ It also conveys a path of upward progress by which humanity gains power to manage and control earth. Humanity will ultimately regain a life of ease through utilizing God’s gift of the earth. Time is viewed as linear with two poles, the beginning and the end, creation and salvation. The mainstream recovery narrative rejects the modern environmental narrative which describes a long, slow decline from our prehistoric past where the world was ecologically pristine and society was more equitable.⁵⁴ Conversely, the environmental narrative suggests a rapid recovery through

sustainable ecology and a more equitable society, not a slow process of recovery through dominion of nature suggested by the biblical narrative. In the environmental narrative, Earth is a victim of exploitation and the beneficiary of restoration.⁵⁵

Cartesian dualism and the Scientific Revolution of the sixteenth and seventeenth centuries also shaped the belief that humans are separate from nature. Rene Descartes and Francis Bacon argued that the immaterial mind and material body are ontologically distinct substances that causally interact. The mind is immaterial and everything of a physical worldly existence is of lesser value than the superior human mind. Nature became re-conceptualized not as mythical, but simply matter-in-motion. Knowledge became viewed as a means to reveal God's presence, an instrument unique to humans. The Scientific Revolution heralded major shifts into new science, new logic, mechanical reductionism, and physics. The meaning of the word nature changed dramatically and became an object of scientific study. Nothing could be wild because everything could now be studied. Nature became a lifeless mechanism; it became the physical world.⁵⁶

Bacon introduced the ideas of hypothesis and data. His anthropocentric view on creation argued that humans are the master of all things. Bacon wanted to convert everything wild into a sculptured *New Atlantis*, a Kingdom of Heaven on earth. He believed this would rescue humanity after its fall from Eden. The Bacon-Cartesian idea is that humans will use science to perfect nature and recreate heaven on earth, rising after humanity's fall.⁵⁷

Following the Scientific Revolution, western society experienced the eighteenth century Age of Enlightenment, a philosophical movement in which critical thinkers began to question traditional institutions and customs. Thinkers of this time period

followed Descartes and Bacon, stressing reason as the primary authority. During the Enlightenment, the attitudes toward the environment shifted to the idea of manifest destiny. This attitude implied that it was reasonable to think that people were made in the image of God and they were given Earth to use for their benefit. Indeed, it was viewed as man's duty to redeem otherwise unwanted and unhealthy lands and put them to more productive use. This manifest destiny view used reductionism and rationality as its basis, as opposed to holistic or intuitive approaches. Reductionist approaches understand nature by reducing things to simpler parts and explanations. Rationality uses logic to explain natural occurrences. Both of these Enlightenment views rely on our ability to reason, and not on our instincts and innate abilities to connect with and understand nature. As Peter Fritzell puts it, "a belief in the perfectibility of man and the redeemability of man's environments provides a legacy that augurs ill for wetlands."⁵⁸

The modern idea of wilderness has its roots in the cultural constructs of the sublime and the frontier.⁵⁹ Sublime lands are seen as rare and sacred places like the mountaintop, waterfall, thunderclouds, rainbow, and sunsets. They evoke emotions and bring one closer to divinity. It is clear that nineteenth century Americans had a stronger desire to preserve sublime places by preserving spectacular landscapes rather than more swampy areas that did not become established wilderness areas and parks until the later twentieth century. An example of the sublime versus the swamp and the transition in the wilderness perspective is evident in the national park system. The first such designation, Yosemite National Park was established in 1872, while Florida's great swamp, Everglades National Park, was not funded and dedicated as a national park until 1947. Fritzell reinforces the sublime versus the swamp in suggesting that "wetlands are not

conventional wild areas. They do not cater to established, classical concepts of vista, horizon and landscape.”⁶⁰ As I further examine in chapter four, historically, wetlands have a reputation of being frightening and unpleasant places. Fritzell concludes, “By comparison with the Smokies or the High Sierra, wetlands are claustrophobic... They do not give you grand views; they humble you rather than reinforce your delusions of grandeur.”⁶¹

The myth of the frontier in U.S. history is the myth of primitivism. Frederick Jackson Turner described how Americans from back east and recent European immigrants were moving to unsettled lands further west, essentially reinventing American democracy. In the 1890s, Turner claimed that the frontier was disappearing as more and more people moved west, simply reestablishing the old democratic communities of the east. He argued that the United States was dependent on free land and wilderness—the frontier, and that is why we established national monuments and parks.⁶² This ensured wilderness for the future and protection of the nation’s myth of origin, frontierism. To some, the American west was a last resort of individualism and “roughing it.” To Turner, the Wild West offered a communitarian theme in which primitive conditions led Americans to bond together and form democratic communities and practices.⁶³

Mainstream Western society defines wilderness as separate from humans. William Cronon argues the Western wilderness definition has hindered our ability to relate to nature in a constructive and progressive way. According to Cronon, the modern understanding of wilderness is somewhere we can escape from our own material creations. Wilderness, however, is not pristine, rather it is a product of our own

civilization. Sublime nature is the older and pervasive cultural construct that comes from the European mindset. Today, sublime nature is referred to as a Romantic perception and the frontier is a construct of American society. The two merged through literature and academic discourse and provide the foundation for today's environmental perspectives and dialogue.

Lynn White argues that the wilderness area mentality attempts to freeze in time a historical ecological existence but ignores an ever-changing natural environment that cannot be locked in time and place. In the nineteenth century, there was a shift in the idea of wilderness from obstacle to progress, to valuable resource, and finally to an endangered landscape in need of preservation. White and others argue that the idea of wilderness did not exist during Paleolithic times because humans were not separate from nature. Wilderness is now viewed by modern people as non-human; places in need of our dominion or stewardship. However, wilderness is a cultural construct, not something separate from us. The wilderness concept has changed from a savage place, desolate and barren, to a new kind of wild beautiful Eden where people may be redeemed and refreshed. To most, it is now a place of recreation, not work.⁶⁴

Preservation is a modern method of protecting wilderness areas from human impact for their aesthetic value, not for possible economic gains. William Cronon identifies an important problem of the modern preservation mentality. He argues that the modern view of wilderness is problematic because of its definition as uninhabited and pristine land. Removing people from a land to justify it as nature is exactly what has harmed our environment over the centuries. Preserving a people-less landscape such as a rainforest or national forest becomes a substitute for the real concern, finding a way to

live a sustainable and harmonious life with nature. As part of western culture, we forgive ourselves for living in cities. People who work the lands are perceived as harmful and indigenous people were removed from their natural homes to preserve natural spaces and to make way for urban development. The western idea of wilderness is also intertwined with the problem of socio-economic class. In the U.S., we construct wilderness areas to provide for those who can afford to use wilderness for recreation. This has been true since just after the Civil War when the elite began to seek wilderness through tourism and consumerism. Wealthy people had second homes or vacation spots near wilderness areas. Nature became a consumer's place, not a place for productive labor or permanent residences. Policies and plans in place to dominate and manage wilderness areas are generally geared toward those who use it for recreation and belittle or disregard those who use the land to make a living.⁶⁵

Meanwhile, we pollute and degrade lands not labeled as wilderness areas. A middle ground between destruction and separation is needed. That middle ground begins with an abandonment of the wilderness-human dualism that labels civilization as bad and nature as good; and it continues by accepting a way of life more in tune with and immersed in nature. Our current concept of wilderness is a serious threat to nature because we continue to work, live in houses, and buy consumer items that contribute directly to the destruction of wilderness. Meanwhile, we believe in preservation of wilderness areas separate from our developed neighborhoods.⁶⁶ Through deconstructing our cultural assumptions of what is nature and by recognizing the objectivity of wilderness and nature as by-products of our cultural upbringings and biases, we can develop a more sustainable relationship with nature.

The wilderness-human dualism is the environmental construct of modern American culture transplanted by European thought. Since humans first established agricultural settlements, the idea of wilderness has been grappled with and debated. It is not clear if a culturally unifying definition and understanding of wilderness will ever exist in the United States or the western world. This may be attributed to our diverse cultural backgrounds and the influences of our own environment and upbringings. To place this in perspective of the wetlands conversation, political lobbyists range from truck driving, wetlands dredging land developers, to bus riding, organic eating environmentalists. Regardless of whether one is a land developer who views wetlands as sources of profit, or one is an environmentalist who views wetlands as sensitive ecosystems in need of protection, one holds a specific value of wetlands and wilderness. One's relationship to nature is inescapable. The conversation addressing what to do with wetlands is never-ending, and will remain that way for a very good reason: we are innately bound to nature and our environment.

Humanity's relationship to nature impacts our view of nature, and thus has a direct influence on how we attempt to solve our modern ecological and environmental problems. Now, we will look deeper into the meaning of our relationship with nature and why humans cannot escape their natural environment. Topophilia and biophilia offer insight on why wetlands and other wilderness areas have been a focal point in Americans' lives through science, transportation, development, agriculture, public policy, environmental management, economics, and recreation. These two distinct theories explain the source of the human-nature relationship. Both theories explain the human-

nature bond that is so vital to the ecological health of earth and the biological and mental health of humans.

Topophilia and biophilia individually and jointly explain the natural tendencies humans have toward nature. Both stress an innate love for nature and natural surroundings. Topophilia is defined by Yi-Fu Tuan as “the affective bond between people and place or setting.”⁶⁷ Perception, attitude, value, and world view are all fostered by one’s experience with place. Unlike topophilia which is specific to one’s surroundings, biophilia can be sought by anyone, anywhere. E.O. Wilson expands on Erich Fromm’s concept of biophilia, the innate relationship we have with life and living things. Simply put, biophilia is the love of life. According to Fromm, biophilia is fostered through the freedom to create, construct, wonder, and venture. Biophilia will develop the most in situations and societies where there is security, justice, and freedom.⁶⁸ The biophilic instinct shared by all people elevates the ideas of life and oneness.⁶⁹

In the context of topophilia, perception, attitude, and value characterize one’s relationship with nature. Perception refers to sensory responses triggered by external stimuli and purposeful activity. While certain phenomena are registered, others recede or are blocked out. Our perceptions have value both for biological survival and preservation of our cultural roots. Attitude is the cultural position one takes in view of the world. Our attitudes have a greater level of stability than our perceptions as they are formed from lifelong experiences and perceptions. Attitude relies on experiences and leads to stronger establishment of values. Therefore, at infancy we lack both experiences and attitudes. Our world view relies on our social context, but includes personal experiences. Our

world view manifests from our attitudes and belief systems.⁷⁰ Our environmental preference is impacted by our biological heritage, upbringing, and physical surroundings.⁷¹

Topophilia is influenced by visual pleasure, sensual stimulus of physical contact, fondness of a familiar place, feeling of home and keeper of the past, pride of ownership or creation, and joy in the health and vitality of all members of the local ecosystem.⁷² The human world is derived from human perception. The sensory organs are the same in all people, but differ from other animals. Vision is the sense we are most dependent upon. Humans possess stereoscopic vision and a highly accurate level of color sensitivity, despite our narrow spectrum visibility. Sight binds our environment to a static space. Objects and boundaries define space through vision; without sight, space is empty. Unlike the other senses, sight triggers little emotional response. An object that is only seen remains distant to the viewer. Hands and tactile senses reveal static details such as shape and texture. The tactile sense offers a direct experience of pressure and resistance. This allows humans to distinguish feelings. Hearing is less essential and less acute in humans compared to other animals. Auditory sound functions to extend space, and gain information beyond our visual field. While sense of smell is important to primates, it is far from the acuity of carnivorous animals. However, the human nose does have the ability to distinguish a wide range of odors. Odor is also a powerful emotional trigger. It takes the simultaneous use of the senses to evoke a complete emotional response. The sight of a forest while driving does not trigger the same emotional response as walking through a forest smelling the crisp air, crumbling a dead leaf in your hand, and hearing the wind blow through the treetops or feeling it on your skin. When

not in use, senses will diminish. This results in different senses strengthening according to one's particular cultural and environmental surroundings. Not only do attitudes to the environment differ based on our direct surroundings, but the capacity of our senses differs as well.⁷³

An individual's perceptions, attitudes, and values reflect three levels of being: biological organism, social being, and unique individual. Humans have the biological ability to receive enormous amounts of sensory stimuli from the environment. Culture and environment are two factors that determine which senses are used and what is perceived. While genetic makeup plays a role in what our senses perceive, our cultural and ethnocentric background determines what colors, sizes, and symbols we detect in our environment. It is the group that enforces cultural standards of society affecting perception, attitude, and environmental value. Tuan calls attention to the danger in cultural influences. A culture can influence perception to such a degree that its people see things that do not exist, a sort of group hallucination. Meanwhile, the physical environment is the second factor affecting perception. Our visual acuity is related to the ecological components in our environment. The environment creates the foundation of cosmologies and world views. Of course, different environments provide a range of opportunities to perceive our world in different ways.

Meanwhile, biophilia explains the deep and complicated mental process of exploring and connecting with life. Erich Fromm first introduced the concept of biophilia in his 1964 book *The Heart of Man*, an analysis of the nature of evil and the human choice between good and evil. Biophilia is the love of life in contrast to the love of death. A biophilous is someone completely devoted to life. Fromm argues three levels

of progression leading to the “syndrome of growth,” or maturity; biophilia, love, and independence/freedom.⁷⁴ The essence of a human is not defined by their qualities or substance, but rather the “contradiction inherent in human existence.”⁷⁵ The contradiction is represented in two components. First, a human is an animal, but the only animal that needs material things, speech, and tools to ensure survival. Second, humans have intelligence like other animals, but unlike other animals, people have self-awareness. Man is “life aware of itself...Man is confronted with the frightening conflict of being a prisoner of nature, and yet to be as it were a freak of nature; being neither here nor there. Human self-awareness has made man a stranger in the world, separate, lonely, and frightened.”⁷⁶ We cope with this existence by seeking harmony and a sense of unity with other living things. We strive for the feeling of union and oneness with life to overcome our separateness from other life. Humans strive for this unification in response to his innate trait of biophilia.

Unlike Fromm’s argument that people are naturally separate from nature because of our material needs and self-awareness, E.O. Wilson argues that thousands of generations of cultural development are to blame for the human-nature dichotomy. Wilson introduces four realms of time all interacting with each other that help characterize biophilia. Moreover people are part of organismic time, where effort takes seconds or minutes to produce any critical action. Humans and larger organisms are made up of billions of cells involved in complex chemical and electrical communication, leading to longer time frames of thinking or acting. Biochemical time exists on a molecular level, and includes brain cell interaction and microscopic events. Biochemical time is too fast for the unaided eye or mind to comprehend. When we compress

biochemical time, we enter ecological time. Ecological time is mathematically defined by birth, death, competition, and replacement.⁷⁷ Ecological time is dependent on the species: a dog and a person will experience different ecological time frames. Gene pools and gene contributions make up evolutionary time. The genes of an individual diffuse steadily outward through children, grandchildren, great-grandchildren, and so on. The unity of the four time frames demonstrate the larger picture of biology, and to understand a single species takes knowledge of all four time frames for a given species. Wilson refers to biology as a time machine, studying evolution over billions of years and split second activities at a molecular level. The Romantics and humanists remind us that science reduces, oversimplifies, and generalizes. It is not until the humanities and science bond that humans and nature will build a harmonic relationship. Humanity's fixation with life and life forms is apparent in both the scientist who studies nature through the time machine, and the Romantic who studies nature through an aesthetic connection. When the two merge, the problematic relationship between humans and all other life will be reconciled. This is consilience at its best: the unification of disciplines leading to a greater understanding of the oneness of life.

Another characteristic of biophilia is humanity's evolving relationship to life through assigned cultural meanings. The snake is an example of this. People generally have an immediate, adverse reaction when a snake is in sight. Western culture's Judeo-Christian foundation uses the snake, or the serpent as a demonic tempter to evil. Biologically, humans have an innate propensity to establish fear of snakes, as do other primates. While we fear the snake, it is in fact a biophilic trait of humans to fear and admire of this creature. Cultures throughout time and place give meaning to the snake's

existence. The snake appears in literature, art, and other cultural patterns across most or all societies as “symbols of sex and power, totems, protagonists in myths, and gods.”⁷⁸ The biological fear of snakes leads to a cultural fear, calling the snake a serpent and assigning it a personality. We have a relationship with the snake through our evolved meaning of the snake. The tendency to give life meaning, and enhance our relationship with it, is an essential component of biophilia.

Wilson further implies that our biophilic tendencies influence our fascination with machines through time. People have a stronger and more interested reaction to natural organisms than to machines. We often adorn mechanical devices with pictures of natural things, such as a desktop image of an island or waterfall. It is the complexity of nature that stimulates our minds. Yet humans design complicated contraptions, and the more complex a machine is, the more interest humans have in it because mechanical complexity resembles nature. We strive to create machines that act independent of the creator and hold complexities similar to our own. This is a result of our love for complex and unpredictable entities that occur naturally—the complexities and intricacies of nature. Our biophilic tendencies lead us to mechanophilia (a love of machines), but humans need to pay closer attention to our dependence on other life forms for our own survival, and less on the aesthetic appeal derived from nature and replicated in our growing obsession with machines.⁷⁹

Wilson describes biophilia as a physical, emotional, and intellectual inclination toward life and nature. Our identity and our need to affiliate with nature are rooted in our connections to the natural world. Our psychological and physical development and well-being rely on this connection. Wilson argues that biophilia is innate, but can be

repressed. Evolution is competitive. Thus, instinctual and innate processes involve competition when resources are limited. The competitive aspect of biophilia is evident in our desire to control our surroundings and create a safe and secure existence by mastering nature.⁸⁰ We instinctively seek nature to foster physical and mental well-being.⁸¹ Aesthetic and symbolic values also play role in our connection to nature and life. While some want nothing to do with nature—exploration, adventure, challenges, and recreation in natural environments is a way some humans strive to attain psychological and physical balance. Furthermore, the unifying connection felt between humans and nature is an influential component of all mainstream religions, including the Judeo-Christian heritage. Creation, peace, harmony, and the cycles of life and death are rooted in religion and sought out in nature. People's attitudes and values become a reflection of these inclinations. Some are more inclined to connect to nature in an aversive or fear driven way as seen in our relationship to the snake, while others connect in a symbolic or moral way as exemplified in fables of the wise owl or the slow and steady tortoise.⁸²

Now that we have examined topophilia and biophilia theories, we can contextualize them. With the ability to rationalize and reason, our actions are influenced by our thoughts versus an animal acting on instincts alone. What we rationalize is based on what we perceive, and what we perceive is based on our immediate, daily surroundings. Yet not only are we capable of applying thought to our actions, but it is natural for humans to do so. A member of an indigenous culture will come to different rationalizations than somebody from modern Western culture. The size and utility of perceived objects will vary greatly from one culture to the next based on their daily surroundings and experiences, which build unique emotional bonds to different life

forms.⁸³ Furthermore, a culture utilizes cardinal directions to define what surrounds their region. When the earth does not offer distinct spatial orientations such as mountains, savannas, water or land, a culture will define boundaries ethnocentrically.⁸⁴

One's psychological structures and responses are formed by their schemata and culturally influenced symbolism. Schemata are structured through binary oppositions. These polarities can be biological, social, geographical and cosmological. Biological, social, and geographical schemata rely on experiences of one's physical reality: life and death, male and female, we and they.⁸⁵ Physical realities are often characterized in a culture by cosmological narration, such as the mainstream Judeo-Christian narrative of Western culture. The circle is a popular symbol used to make sense of life's contradictions and often representing harmony, oneness, and wholeness. One perceives the world with "self" as the center. Ethnocentrism is a universal human trait that defines symmetry and space. While egocentrism cannot be achieved because of a constant reliance on other human beings for survival, ethnocentrism is more attainable. A group, rather than an individual *can* achieve a strong level of self-sufficiency and sustainability. The early maps of Greeks, other Europeans, Chinese, and American Indians reveal an ethnocentric world view through the central positioning of their own culture and the size distortions of themselves and others.⁸⁶ While the group plays a major role in one's world view, we must not forget the individuality of every single person. Physiology and temperament, including differing levels of endocrine secretion, sex, and age all influence environmental attitudes and life views. Someone who is color-blind, a person with an uneasy temperament, or a passive individual will all develop differently. An individual's needs, desires, and expectations will stand out above social demands for harmony in a

group.⁸⁷ The group helps shape the individual's schema and perception of the world and environment.

There is a reciprocating causal relationship between topophilia and environment. This is apparent in our aesthetic appeal, physical connection, patriotism, and the urbanization and wilderness dichotomy. For example, aesthetic appeal is exemplified in the differences between the visitor and the native. The native's view of their local environment is influenced collectively by behavior, local tradition, lore, and myth. The outsider's perspective is limited to aesthetic response to the environment, judging simply in terms of appearance and beauty.⁸⁸ The outsider's view is superficial, while the native's view is skewed by the stability of long-term dwelling. This is not to say that the outsider's view is worthless, as they can certainly offer a fresh perspective. While topophilia includes any human's bond to the material environment, a more permanent topophilic connection is felt toward a place one calls home. Awareness of the past, loyalty, elements of history, and a society's heroes build a bond that fosters patriotism. Patriotism literally means love of one's natal land. Patriotism is an interesting influence based on pride and power, versus locality. One may be patriotic toward their residence, but it is not a required characteristic. Experiences, intimate knowledge, and symbols contribute to one's feeling of patriotism. It was once a local sentiment, but with modern mobility, one may be fond of their locality and patriotic toward a land halfway across the world.

The dichotomy of man and nature is exemplified more in urban life than rural life. A typical city dweller has little physical contact with the nearest natural environment, often developing a less intense and limited visual relationship. A typical farmer however,

works closely with the land and develops a more personal relationship with nature. The life of a rural resident is rooted in nature and connects to the cycles of nature more so than a city dweller. While a farmer's life may be full of hardships, "familiarity breeds affection when it does not breed contempt."⁸⁹ However, some urbanites and suburbanites seek the outsider's aesthetic bond to nature through vacations and temporary interactions with nature. Landscape architecture and gardening are other ways to inject nature into cities and suburban areas and fulfill the desire for connections to nature. Balance is often sought in urban areas between human constructed buildings and natural environment.

The city is an important place of observation. City dwellers have limited control of their environment, perhaps in their homes, neighborhood interactions, and work place. While people living in cities may have similar lifestyles and daily interactions, their perception and world view will differ from one another. Tuan contends that attitudes toward the environment start in cities, leading to the dichotomy of man and nature. Cities reinforce the idea of wilderness and a human-constructed Eden. Three types of environment manifest unique attitudes from mainstream America: the chaotic, demonic, and pure wilderness; the idyllic Edenic garden and farm; and the orderly city blessed with freedom and glory but plagued by oppression and corruption of natural values.⁹⁰ The perspectives and attitudes of city and suburban dwellers are shaped by their topophilic relationship to their immediate environment even if the immediate environment found in a typical city or suburban area lacks the naturalness found in more rural areas. A city dweller may be more influenced by biophilic tendencies than topophilic tendencies to explore and connect with nature. A typical developed area may have trees, parks, lakes,

and gardens, but some seek to fulfill a deeper biophilic connection than urban surroundings have to offer.

One result of ignoring our dependence on and oneness with nature is the loss of genetic and species diversity as a result of the destruction of natural habitats. The greatest problem with the loss of genetic diversity is that we are losing pieces to the puzzle of life. Wilson insists that if we want to understand how the puzzle of life fits together, we cannot destroy pieces of it.⁹¹ According to Wilson, our typical thought process hinders the ability to think of future generations, as we naturally focus on our own physiological well-being. Our values are time-dependent to ourselves and seldom incorporate the needs of distant generations. To enhance our conservation ethic, we need to be more aware of evolutionary time versus organismic time.⁹² Current conservation efforts across all cultures have been limited to immediate social needs.⁹³ Wilson calls this surface ethics. We approach conservation decisions with the same outlook as deciding the relative value of a piece of artwork or a book. We favor certain animals or species because of the superficial role they play. For example, dogs serve as pets and deer as game, while many people kill ants and rats without hesitation perceiving the latter to be lesser species serving little purpose. These surface ethics are helpful as the start to developing value criteria, but are far from complete.⁹⁴ Wilson introduces Garrett Hardin's interpretation of human altruism as the only solution. To make conservation work, Hardin argues that humans need to act on purely selfish reasoning, thus we must realize premises that fit our best interests.⁹⁵ Wilson similarly expresses that protection of the human spirit is the key to ultimate survival. This can be attained through balancing expansion, or personal freedom, and delicate, sustainable stewardship.

While the differences in the two theories are important, the application and combination of these theories helps us understand our relationship with nature, both individually and culturally. Topophilia is triggered by one's immediate surroundings and biophilia by one's biological tendencies. Both are necessary to understanding our relationship with nature and the environment's fragile existence. In 1983, Howard Gardner introduced the theory of multiple intelligences.⁹⁶ This theory suggests that seven intelligences define human thought and most of us only possess strengths in limited intelligences (perhaps one or two types). The seven intelligences are linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal, and intrapersonal. An eighth intelligence, introduced by Richard Louv, is our natural intelligence developed through readily using our senses, being outdoors, noticing patterns and anomalies, and being aware of our surroundings.⁹⁷ Nature is the direct stimulus of our eighth sense. Most importantly, nature's well-being depends on the relationship society fosters between our youth and the environment. An attachment to land will maintain the role of nature as an emotional stimulus. This attachment can occur naturally through the processes of topophilia and biophilia, but the success of our relationship to our surroundings depends on how we foster our topophilic and biophilic tendencies. If we neglect these natural tendencies, or only place ourselves in contact with commoditized nature or virtual nature, we will continue to damage our bond with nature, placing our planet's health and personal health in a deadly dilemma—and we are arguably already there.

We can now apply these concepts to our original question: what to do about wetlands? With wetlands existing in every state, we must first decide what is important

about our relationship with wetlands, and then decide how wetlands should or should not be regulated. Oftentimes regulations impact private property; indeed roughly 75% of all wetlands in the United States are in private hands. This brings about complex discourse regarding the Fifth Amendment to the Constitution, which states that private property cannot be taken (or used) for public purposes without just compensation. Our decisions regarding wetlands protection are influenced by our historical relationship with wilderness and our innate desire to relate with nature. Now that we understand the deeply embedded roots of our perspectives of wilderness—and by extension, wetlands—we can examine the stems of Americans’ changing perspectives toward wetlands since the colonial settlements of the 1600s.

Wetlands offer a variety of values including aesthetic appeal, cleaner water, wildlife habitats, and flood control. While some enjoy wetlands for recreation and something of a Romantic experience, others see their functional value. Still, there are others who view these ecosystems as a nuisance or waste of space. However, whether or not it is evident to them, residents in Hillsborough County have some form of relationship to wetlands. This is because of our relationship to our locality. This relationship is a source of care and concern for the value of wetlands whether they are economic, recreational, aesthetic, or holistic values. The local community will ultimately decide what aspects of wetlands are appealing and worth protecting. This is not a simple task because each person has a different perspective on these precious habitats. The way in which humans connect with natural environments is partly defined by their topophilic relationship to their surroundings. The way they were raised, the environment they are from, and the values instilled by their community all impact their idea of nature. In

Hillsborough County, there are folks from rural areas of the county, developed cities within the county, and implants from all over the world seeking Florida's paradise. These varying perspectives influence the wetlands discourse in Hillsborough County, and elsewhere. Each perspective brings a different attribute to the table from personal freedoms to sustainable stewardship. Our biophilic connection to nature is the reason for the constant dialogue (if people did not feel connected to their surroundings, there would be apathy and essentially no conversations about wetlands). Sometimes the conversation gets complicated, especially when local residents believe their government can better serve the needs of their immediate surroundings than state or federal governments. The following chapters will examine this conversation.

Chapter 4

Historic Trends of Wetland Perceptions in the United States

Until recent decades, America's perceptions of the environment encouraged destruction of wetlands throughout the nation. The original colonists viewed swamps as worthless and disease-ridden and avoided them altogether. Gradually, federal policy and public attitudes took a turn toward conservationism, but conservationism did not have the same meaning that it carries with modern environmentalists. In fact, early conservationist attitudes encouraged more orderly and efficient use of natural resources—but use of these resources. While some of these early conservationists acknowledge the importance of wetlands and other natural areas, there was little public awareness of wetland contributions toward wildlife and human well-being. Once the importance of protecting natural resources reached the public radar, environmentalism emerged to protect our nation's remaining wetlands. While the U.S. had previously been occupied and mildly altered by numerous Native American groups, it was not until centuries after the arrival of Europeans in America that massive degradation and alteration of wetlands began. For the first time in our history, federal regulations are striving for no net loss of wetlands—and this is directly attributed to the increased environmental awareness of the twentieth century.

Before 1800, America's landscape was quite different than it is today. It is estimated that the lower 48 states contained 221 million acres of wetlands in the 1780s, but two centuries later over half of these wetlands were converted to other uses.⁹⁸ One

factor that helped create many wetlands prior to early colonists was the presence of an estimated 60-400 million beavers building dams and flooding landscapes.⁹⁹ Alligators serve a similar purpose by digging holes that trap water. This creates small reservoirs important for other species during the annual dry season in the Everglades. The glaciated north of the continent spills water into the Missouri and Ohio Rivers, which eventually join the mighty Mississippi which pours out southward through the bottomland forests of the Mississippi River floodplain before reaching the Gulf of Mexico. Of course, Florida, the upper Midwest, the South Atlantic and Northeastern states all had many wetlands.¹⁰⁰ While this general pattern still exists, it has been greatly disrupted since the colonial era. While Native Americans had a modest impact on the natural landscape, European contact and mass settlement, agriculture, industrialization, and urban development threaten the integrity of our ecosystems, biodiversity, and water quality.

Prior to European arrival in the New World, Native Americans used wetland resources for food, medicine, shelter, and tools. They would harvest and hunt fish, shellfish, waterfowl, and other game. They would pick berries and other edibles such as cattails. Many made use of hydrophytes for medicinal purposes. Others used wood from wetlands for shelter, firewood, and tools for hunting and eating. Settlements by a river, stream, or sea shore were desirable because of the access to drinking water, seafood, and water transportation. Eventually Native Americans began to plant crops such as corn, beans, and squash. While they were making use of land for agricultural needs, their impact on wetlands was minimal. The agricultural practices of pre-colonial groups did not have a great impact on wetlands because they did not have the advanced tools to alter

large areas of land, and their relatively small population had access to copious natural resources, so they did not have the need for intense land management.¹⁰¹

The very first colonists in North America had little need to change the landscape because of availability of productive land elsewhere and the lack of tools to alter wetlands. By the 1630s, the Puritans of the Massachusetts Bay Company sought a moral landscape—a political, theological, and natural landscape. It was common for them to see the taming of wetlands as a kind of public service leading to economic success. The initial attitude toward wetlands to simply “leave them be” changed rapidly. The Puritans settling near today’s Boston wanted private property, knew of the unhealthy reputation of wetlands, and viewed creating usable land from marshes as beneficial and desirable. Moreover, they viewed both swamps and Native Americans as evil and in need of taming and spiritual salvation. Draining wetlands eventually became considered as a public service, ridding areas of mosquito and malaria filled swamps. Removing the foul smelling air and the natives was viewed as an improvement of the landscape. Early European settlers found prospects of economic hope and private property in wetlands drainage in the New World. As early as the late seventeenth and early eighteenth centuries, the northern U.S. focused on commerce and commercial success through timber and other natural resources, and the South focused on agricultural opportunities the mild climate encouraged. The uniting goal was to transform useless swamps, marshes, and bogs into economically profitable resources.

Early American naturalists and Romantics recognized the sheer beauty of wetlands. William Bartram is famous for his eighteenth century account of the natural landscape along the eastern coast of the United States, including much of Florida.

Bartram spent much time in the forests and wetlands of Florida, primarily in the St. Johns River region. These adventures were documented and originally published in 1791.¹⁰² John Audubon was an ornithologist, naturalist, hunter, and painter in late eighteenth and early nineteenth century America. While Audubon was not a literary figure, his artistic endeavors are well known through his publication of *Birds of America*, which is full of paintings and artwork of birds in swamps and marshes.¹⁰³ His paintings aimed to uncover the beauty of these much belittled landscapes. Henry David Thoreau was a student of the nineteenth century transcendentalist Ralph Waldo Emerson. Both men engaged in first hand encounters with the environment and believed that nature is not separate from consciousness.¹⁰⁴ These early wetlands preservation supporters added to the cultural conversation but failed to prevent wetland conversion in the nineteenth century. Early American literature held conflicting views of wetlands, but the most popular view was a negative one.

Other figures in literature prior to the twentieth century expressed the more commonly held view of wetlands as dismal and unhealthy places. Ann Vileisis argues that the publication of fictional, exaggerated, and misleading representations of wetlands in myths and literature helped to shape the early negative views of wetlands.¹⁰⁵ The Old English story of *Beowulf* depicts Grendel as a monster that stalks through the marshes and fens.¹⁰⁶ In 1732, Carl Linnaeus, (a botanist) described the Lapland peatlands of Finland as hellish.¹⁰⁷ Another popular example of this is found in Washington Irving's "The Legend of Sleepy Hollow" with the headless horseman appearing out of the swamps.¹⁰⁸ These stories have stood the test of time and portrayed wetlands as fearful

and gruesome. This negative depiction of wetlands in literature influenced the cultural perception of wetlands as worthless mucks.

The environment remained interesting to some late-nineteenth and twentieth century writers. John Muir, the father of the American preservationist movement and founder of the Sierra Club was a Romantic and travel writer who wrote about his view of the web of life—specifically, seeing God within nature. Muir documented his journey through Florida’s panhandle and down the Big Bend to Cedar Key in *A Thousand Mile Walk to the Gulf* published in 1916.¹⁰⁹ Aldo Leopold was a forester and ecologist of the nineteenth and twentieth centuries and founder of The Wilderness Society. Leopold published *A Sand County Almanac* inspiring the use of science to make ethical environmental choices. He summarizes his land ethic by stating that “a thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise.”¹¹⁰ The view placing humans within the community of life was not commonplace in twentieth century America. Romantics and naturalists rejected the popular view of humans being above nature holding dominion over the land. Slowly, these views eventually became embedded in public discourse and environmental organizations, such as the Sierra Club and Audubon Society.

Florida’s extensive wetlands inspired writers and environmental activists alike. May Mann Jennings, Marjory Stoneman Douglas, and Marjorie Carr are important female figures in America’s twentieth century environmental movement in Florida. May Mann Jennings, the wife of former Florida Governor William S. Jennings (1901-1905), spearheaded the Florida Federation of Women’s Clubs movement to preserve Paradise Key, leading to the establishment of Royal Palm State Park in the Everglades in 1916.¹¹¹

Marjory Stoneman Douglas is famous for her environmentally conscious rendition of the history and ecological state of the Everglades in *River of Grass*, originally published in 1947. She lived to the age of 108 (passing away in 1998), and spent the second half of her life fighting for the Everglades and environmental protection in Florida.¹¹² Marjorie Carr, wife of ecologist and conservationist Archie Carr, was a prominent leader in the grassroots fight during the 1960s and 1970s to end the construction of the Cross Florida Barge Canal, a plan that would have permanently damaged some of Florida's sensitive wetlands, including the Green Swamp, and the St. Johns and Ocklawaha River floodplains.¹¹³

Selected pieces of twentieth century Florida literature describe wetlands and represent the ups and downs of swamp life. Zora Neale Hurston's characters provide awe-inspiring and sometimes distasteful expressions of wetlands. In Hurston's *Their Eyes Were Watching God*, she describes Tea Cake and Janie's experience in the Everglades. "To Janie's strange eyes, everything in the Everglades was big and new... Weeds that did well to grow waist high up the state were eight and often ten feet tall down there. Ground so rich that everything went wild.... Dirt roads so rich and black that a half mile of it would have fertilized a Kansas wheat field. Wild cane on either side of the road hiding the rest of the world. People wild too."¹¹⁴

Her account of the 1928 hurricane showed nature overcoming the power of man. "It woke up old Okechobee (sic) and the monster began to roll in his bed... The folks in the quarters and the people in the big houses further around the shore heard the big lake and wondered. The people felt uncomfortable but safe because there were the seawalls to chain the senseless monster in his bed."¹¹⁵ People tried to control nature by wrapping a

wall around Lake Okeechobee, but their feeble efforts were no match for the storm of 1928. Suddenly Tea Cake shouts “De lake is comin’!”¹¹⁶ The dike did not hold up and Janie and Tea Cake find themselves running from the gushing waters. This is important to understanding the view that nature is meant for humans to dominate and manipulate. However, here we see humans succumbing to the power of nature and witnessing the role wetlands plays in storm abatement and flood control. The dike provided a false sense of security (no dike would have ended with the same result). Perhaps if people had not settled in the swamp to begin with, the storm of 1928 would not have taken the lives of more than 2,500 people.

In Marjory Kinnan Rawlings’ *The Yearling*, the Baxter family experiences the trials and tribulations of living near a sinkhole amidst a bottomland forest swamp. While Pa and Jody Baxter spend several occasions hunting for bear, deer, and other forest creatures, the swampy conditions make one appreciate a good pair of boots. Sometimes, the swamp dwellers provide unfriendly encounters: once, Penny Baxter nearly dies from a rattlesnake bite. Rawlings describes the Baxter’s hunting path as they emerge out of the forest and hammocks: “to the south and west lay a broad expanse that looked at first sight to be a meadow. This was the saw-grass. It grew knee-deep in water, its harsh saw-edged blades rising so thickly that it seemed a compact vegetation.”¹¹⁷ Rawlings continues: the hound, “Old Julia splashed in it. The rippling of the water showed the pond. A gust of air passed across the open area, the saw-grass waved and parted, and the shallow water of a dozen ponds showed clearly... The treeless expanse seemed to Jody more stirring than the shadowy forest.”¹¹⁸ Her description of marshlands in central

Florida evokes feelings of tranquility and wonderment—a quite Romantic take on wetlands.

Literary voices are a reflection of public opinions that influence federal and state policies. The twentieth century witnessed major technological advances in agriculture, urbanization, and industrialization that further impacted wetlands. Wetlands were viewed as nothing but a nuisance during this time. Bugs filled the air, farmers were limited to growing rice, wetland animals ate their crops, and the terrain hindered transportation. These problems led to the development of drainage technology. Unfortunately, the increased technology and thriving agriculture industry resulted in dried out wells and a rapidly declining waterfowl population.¹¹⁹ The view of wetlands as conquerable and in need of drainage held strong on the minds of Americans until recent decades and is evident in federal and state wetland policy.

Chapter 5

Federal Wetland Regulation

Economic prosperity and private property rights have swamped wetlands legislation. With various governmental agencies owning and controlling only about a quarter of the country's remaining wetlands, private land rights and wetland values are both at stake. All regulations regarding wetlands have to wrestle with the constitutional right of private property. Yet landowners impede on the public's rights when private property is used in ways that threaten public water supply and water quality. Legislators and agency officials must distinguish the public aspect of "wet" from the private aspect of "lands" on wetlands property. With this in mind, it is easy to realize the difficulty all levels of government have in balancing adequate wetlands regulations and landowner demands for use of land. Although we have wetlands regulation, we still experience loss of fully functioning wetlands.

The federal government was first encouraged by public voices in the mid-1800s to step into the wetlands scene, not to protect wetlands, but to drain wetlands for agricultural and urban development. It seemed silly to allow these mosquito-filled, spongy masses of land and water to remain unproductive wastelands. It was not until the late nineteenth century that the federal government launched any conservation and preservation efforts and it took even longer for the public and federal government to assign worth to swamps as valuable spaces in need of protection.

Prior to World War II, the federal government's involvement with wetlands was specifically to encourage and finance extensive wetland conversion to agriculture, transportation, and urban development. The Federal Swamp Land Acts of 1849, 1850, and 1860 transferred a total of 64,895,415 acres of wetlands to state ownership in hopes of increased drainage.¹²⁰ Most of this land has since been put into private hands. Ironically, these are some of the same lands the federal government is now trying to buy back for conservation purposes. Drainage projects initiated and funded by the U.S. Army Corps of Engineers continued to promote wetlands conversion throughout the nineteenth and twentieth centuries, but many such efforts were privately motivated and resulted in much of the agricultural land in the U.S. today.¹²¹ The Rivers and Harbors Act of 1899 (sometimes called the "refuse act") established a basic permitting system aimed at preventing obstacles in navigable waters. By default, the Rivers and Harbors Act became something of a water pollution control act.¹²² For example, in 1959 the U.S. Supreme Court ruled in *United States v. Republic Steel Corp.* that the Act could be used to combat wastewater discharges caused by a steel mill. With a concern for the spread of communicable diseases, the Act also provided the means to prevent inappropriate discharge of human waste near drinking water sites. It was also significant as it was the basis for both the National Pollutant Discharge Elimination System (NPDES) and Clean Water Act (CWA) permitting systems.¹²³

Both the Migratory Bird Treaty Act of 1918 and particularly, the Migratory Bird Conservation Act of 1929 gave the U.S. Department of the Interior authorization to acquire and protect important wetland resources.¹²⁴ Yet, by the 1930s, there was an apparent decline in waterfowl due to the loss of wetland habitat. The Federal Duck

Stamp Program of 1934 provided funds for the purchase and protection of additional wetlands. The Federal Water Pollution Control Act of 1948 was developed to control water pollution through state-led efforts with only limited federal assistance.¹²⁵ This Act yielded poor results with few states following the guidelines for adequate enforcement of water-quality standards.¹²⁶ Meanwhile, the U.S. Department of Agriculture and the Army Corps of Engineers continued to encourage, subsidize, and finance wetlands conversion projects.¹²⁷ Still, the inherent value of wetlands remained unseen by the general public. While some fought to maintain wetlands, it was usually for hunting, fishing, or waterfowl and wildlife protection. Other values such as flood control, storm abatement, and water quality remained largely unrecognized until mid-century.¹²⁸

A few federal acts emerged in the 1960s that offered some level of wetlands management and protection including the Fish and Wildlife Coordination Act (1967) the Land and Water Conservation Fund Act (1968), and the National Environmental Policy Act (1969). The Fish and Wildlife Coordination Act “provides the basic authority for the Fish and Wildlife Service’s involvement in evaluating impacts to fish and wildlife from proposed water resource development projects” ensuring consideration of fish and wildlife resources as part of project features.¹²⁹ The Land and Water Conservation Fund Act “regulates admission and special recreation user fees at certain recreational areas and establishes a fund to subsidize state and federal acquisition of lands and waters for recreational and conservation purposes.”¹³⁰ The National Environmental Policy Act established the Council on Environmental Quality (responsible for coordinating federal agencies and White House offices to develop environmental policies and initiatives) and a national policy for the environment.¹³¹ The agencies responsible for enforcing these

acts were the U.S. Fish and Wildlife Service, Bureau of Land Management, Forest Service, National Park Service, Council on Environmental Quality, and the Environmental Protection Agency (created in 1970). Meanwhile, the U.S. Army Corps of Engineers and the Soil Conservation Service continued to support drainage projects in direct conflict with the other federal agencies' goals.

Until 1972, federal jurisdiction over wetlands was limited to interpretations of the Rivers and Harbors Act of 1899. The 1899 Act limited Corps jurisdiction to waters affected by tidal flows or used by interstate or foreign commerce.¹³² By the mid-1970s, scientists made significant progress in identifying and quantifying the many values of wetland ecosystems.¹³³ Subsequent to increased public knowledge, environmental lobbyists made more noticeable efforts in Congress. In response to the increased public pressures to address the state of wetlands, President Jimmy Carter issued an Executive Order 11990 in 1977 instructing federal agencies to minimize damage to wetlands. In the same year, Carter issued Executive Order 11988 requiring federal agencies to avoid activities on floodplains whenever possible. Federal agencies were also advised on specific procedures to determine direct and indirect impacts their activities had on floodplains.¹³⁴

William Mitsch and James Gosselink argue two important points regarding federal wetlands management. First, there is no specific national wetland law. Wetlands management and protection are regulated by a series of laws intended for other purposes. Further, these laws are spread out across agency boundaries requiring difficult interagency coordination. Second, wetlands are managed under regulations addressing both land use and water quality. They argue that these two separate issues cannot provide

a comprehensive wetlands policy.¹³⁵ There is a need for consilience in the scientific realm to encourage union in legislation. Mitsch and Gosselink suggest that a split occurs between ecologists who study aquatic systems and those who study terrestrial systems. Very rarely does an individual have expertise in both fields.¹³⁶

According to Joel M. Gross and Lynn Dodge, the 1972 amendments (including Section 404) to the Federal Water Pollution Control Act (the Clean Water Act or CWA) represent a “change in regulatory philosophy from water-quality standards established by states to a ‘clean waters’ approach.”¹³⁷ The main objective of Section 404 was to maintain and in many cases restore the water quality and integrity of waters in the United States. Section 404 requires that anyone dredging or filling in the waters of the United States must first obtain a permit from the U.S. Army Corps of Engineers (Corps). Section 404, or the Dredge-and-Fill Permit Program, is enforced by the Corps with the assistance of the Environmental Protection Agency and U.S. Fish and Wildlife Service. This was essentially an extension of the 1899 Rivers and Harbors Act in which the Corps was already responsible for regulating the dredging and filling of navigable waters.¹³⁸ The Corps initially applied their responsibility to navigable waters because Section 404 did not explicitly refer to wetlands as “waters of the United States.” The Act aimed to eliminate all discharges of pollutants into U.S. waters by 1985. Specific goals included improving water quality to ensure safety for fish, wildlife, and recreational use; prohibiting the discharge of toxic amounts of pollutants; and more federal financial assistance for water treatment works, waste treatment management plans, research and development to eliminate discharge of pollutants, and programs to control non-point sources of pollution.¹³⁹ The Act made it necessary for everyone to receive authorization

from the federal government to discharge of any pollutant into the waters of the U.S. Congress shifted the enforcement and determination of allowable levels of discharge from the states to the Environmental Protection Agency, created in 1970.¹⁴⁰

Between 1972 and 1977 judicial decisions called for a clear definition of wetlands. Two U.S. Supreme Court decisions (in 1974 and 1975) and Executive Order 11990 in 1977 ensured the Corps' responsibility for regulating many non-navigable waters including wetland areas under the Section 404 guidelines.¹⁴¹ Following these cases and Executive Order 11990, regulations included coastal and freshwater wetlands as "waters of the United States," as long as the wetlands were connected to navigable waterways. In 1977 the Corps completed a regulatory definition for wetlands. These legislative and executive decisions led to the amendments of the CWA in 1977 and again in 1987. The 1977 Amendments required the best available technology to be implemented for limiting toxic pollutants, and it called for best management practices for pollutant elimination by July 1, 1984.¹⁴² While the EPA was the final authority on management and enforcement of standards and waste management, the 1977 amendments called upon the states to bear the initial responsibility.¹⁴³ The 1987 Amendments "phased out construction grants program and introduced the State Revolving Fund (SRF)."¹⁴⁴ The goal of the SRF was to finance not only municipal wastewater collection and treatment facilities, but also improvements to waste management, water protection, and pollution control projects. The amendment also included the Water Quality Act of 1987, which strengthened point source storm water discharge regulations.¹⁴⁵

There are three major components to the screening process for a Section 404 permit. The first of these is avoidance—are there practicable steps that can be taken to avoid wetland impacts? Second, if complete avoidance is not possible, minimization should be attempted—how can the potential impacts on wetlands be minimized? Third, if neither of these provide a practicable alternative, mitigation is considered—how can the permit-holder provide “compensation for any remaining, unavoidable impacts through restoration or creation of wetlands?”¹⁴⁶ The main objective of Section 404 in regards to wetlands is to issue a dredge and fill permit only if no practicable alternative exists.

With unclear language in defining specific activities and specific waterways, the extent of protection Section 404 provides remains open to debate.¹⁴⁷ There are certain activities subject to Section 404 regulations and some that are exempt. Controversy has erupted over the exempt activities. Regulated activities include discharge of dredged or fill material into the waters of the United States, landclearing resulting in the addition or redeposition of dredged material, dredging, drainage, and the placement of pilings in waters of the U.S.¹⁴⁸ Exemptions apply to discharges of dredged and fill material resulting from normal farming, silvicultural, and ranching activities; maintenance or emergency reconstruction of dams, bridges, levees, and other transportation structures; construction of certain irrigation, drainage, or sedimentation systems; construction of forest and farm roads or temporary mining roads; and some state-approved activities.¹⁴⁹ According to Joel M. Gross and Lynn Dodge: “In general, routine discharges made in the course of ongoing activity are exempt while one-time discharges resulting in permanent alterations are not.”¹⁵⁰

The Corps issues three types of Section 404 permits. Individual permits are issued on a single project basis when planned activities result in potentially significant impacts. When an activity will result in minimal effects, general permits are often issued. General permits group together activities that are similar and cause only minimal adverse effects when performed separately.¹⁵¹ Nationwide, regional, or state permits are issued for some common activities such as cranberry production, minor road construction, utility line backfill, and bridge repairs. The Corps is ultimately responsible for deciding whether or not to grant permits considering all aspects of an application, but it does not stand alone. The Corps receives assistance from the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and state agencies when considering dredge-and-fill permits involving wetlands.¹⁵² The EPA has the power to designate wetlands subject to permits and to veto Corps' decisions. Some states have their own permitting process that is separate from the Corps' permitting process.

States can apply to the EPA to take the place of the Corps in issuing Section 404 permits within the state. Only Michigan and New Jersey have opted to assume control of Section 404 permitting in their states.¹⁵³ Applicants bear an additional burden when states have a permitting program separate from the Corps' program and both require separate applications. To remedy this, some states work with the Corps to establish a joint permit application to meet state and federal application requirements.¹⁵⁴ The individual application process can take several months. The Corps encourages anyone involved in a major project applying for a permit to meet with a Corps consultant for a pre-application consultation.¹⁵⁵ This consultation is an opportunity for the applicant to

learn about the application and review process, the factors that will be considered, and any documents the applicant should prepare ahead of time including possible mitigation plans. The applicant must provide a thorough description of the proposed activity, the location, purpose, and need for the activity, schedules, and a list of authorizations required by other governmental agencies.¹⁵⁶ The fee is virtually insignificant; applicants pay only \$10 for non-commercial activities and \$100 for commercial activities.

Stephen M. Johnson outlines the Corps' steps in the permit process.¹⁵⁷ The Corps has fifteen days from the receipt of an application to determine whether it is complete and a public notice can be issued, or incomplete and the applicant needs notification of the missing information. Once the application is complete, a public notice is issued which allows the community an opportunity to comment on the proposed project. The public notice must remain posted at least fifteen days and no more than sixty, the general length of time being thirty days. After reviewing the substance of the public notice comments, the Corps will determine if a public hearing is needed. The Corps will conduct a hearing if any person requests such a hearing during the comment period, unless the request lacks substance. Section 404 guidelines require the Corps to review every wetland permit application and prohibit the Corps from issuing any permit if there is a "practicable alternative" that would have a less adverse effect on the aquatic ecosystem. Section 404 also prohibits the Corps from approving any permit when the activity significantly contributes to the degradation of the waters of the United States; or violates water quality standards, toxic pollution standards, or federal marine sanctuary protection requirements; or jeopardizes endangered species or their critical habitats.¹⁵⁸ The Corps then weighs the public interest impacts of the proposed project. Finally, the Corps reviews any

requirements of other laws such as the National Environmental Policy Act which sometimes requires environmental impact statements for major projects causing significant changes in the quality of the environment.¹⁵⁹

Section 404 of the Clean Water Act charges the Corps to determine if practicable alternatives exist in the case of an individual permit application. Two presumptions are outlined in the Corps guidelines to determine if a practicable alternative exists. The first is the “water dependency” test which presumes that a practicable alternative does exist if there is no requirement for access or proximity to the specified aquatic site to fulfill its basic purpose.¹⁶⁰ The second presumption is that all suggested practicable alternatives have a less adverse impact on the aquatic ecosystem than the proposed discharge.¹⁶¹

Mark T. Pifher categorizes the steps the Corps takes within these presumptions to compare practicable alternatives with the project’s purpose. The Corps first defines the project purpose including multiple purposes in multi-component projects, and examines the project’s water dependency. Then, the Corps identifies practicable alternatives based on ownership and availability, timing of availability (the “market entry test”), the geographic scope of the alternatives, availability and other legal obstacles to the alternatives, the cost and economic viability of alternatives, logistics and technological feasibility, and a comparison of environmental impacts.¹⁶²

When no practicable alternative exists in a project application for a Section 404 permit, the Corps can opt to allow an applicant to remedy the harmful impacts on wetlands through mitigation—that is recreating or restoring wetlands that offer similar functions in a nearby location. Historically the Corps has been known to allow applicants to “buy down” adverse effects of their projects through proposing mitigation in their

original application.¹⁶³ The U.S. Supreme Court ruled in *Town of Norfolk and Town of Walpole v. U.S. Army Corps of Engineers* (1992) that it is reasonable for the Corps to consider mitigation measures to prevent secondary impacts under the practicable alternatives analysis.¹⁶⁴ The Corps now uses a sequencing approach that does not allow for compensatory mitigation within the practicable alternatives requirement. In this sequence, an applicant must first demonstrate that no practicable alternatives exist and propose ways to minimize the project's impacts. Only then will compensatory mitigation be considered for unavoidable adverse impacts to aquatic ecosystems.¹⁶⁵ One might suggest that the net result of the sequencing method toward mitigation would not differ much from allowing applicants to initially buy-down adverse impacts through mitigation. It merely changes the order in which the Corps approves mitigation measures.

The four types of mitigation projects recognized by the Corps and the National Research Council are restoration, creation, enhancement, and preservation. All methods are accomplished with human intervention or activity. Restoration is the process of returning a wetland to its existing condition prior to human disturbance.¹⁶⁶ Restoration is the preferred course of action because it is more likely to be successful than the other alternatives.¹⁶⁷ Wetland creation is the conversion of land or shallow waters into wetlands.¹⁶⁸ Enhancement is the increase of one or more functions of an existing wetland.¹⁶⁹ Preservation of wetlands without alteration protects existing wetland from future threats.¹⁷⁰

There are several factors which characterize compensatory mitigation projects. The Corps examines on-site versus off-site mitigation projects. On-site mitigation is almost always preferred because it offers more direct affects to the area being degraded,

but sometimes off-site projects provide watershed benefits to the impacted area.¹⁷¹

Although mitigation projects are most desirable within the same watershed, costs, long-term maintenance, and likelihood of success are also considered in the decision making process.¹⁷² The Corps then looks at in-kind versus out-of-kind wetlands, comparing the type and functions of wetlands in the proposed compensatory mitigation project and the type and functions of wetlands to be degraded by the permitted activity. The Corps attempts to maintain no net loss of types or functions of wetlands by permitting activities.

The Corps also authorizes the use of mitigation “banking” in which states, federal agencies, or private entities may sell credits for wetlands development based on their own wetland creation or restoration activities. There are single-client banks in which the bank sponsor offsets its own development projects, and there are entrepreneurial banks that sell mitigation credits to others.¹⁷³ President George H.W. Bush’s introduced the goal of no net loss in his 1988 presidential campaign and his administration added no net loss of wetlands and wetland functions as a short term goal to the EPA policy in 1989. This goal started with the U.S. Environmental Protection Agency’s request to hold a *National Wetlands Policy Forum* in 1987. The Forum was responsible for investigating the state of wetlands management in the United States and it formulated one overall objective:

to achieve no overall net loss of the nation’s remaining wetlands base and to create an restore wetlands, where feasible, to increase the quantity and quality of the nation’s wetland resource base (Nation Wetlands Policy Forum, 1988).¹⁷⁴

The forum recommended that not only should there be no further decrease in the number of wetlands, but that in the long run, the number and quality of wetlands should increase.¹⁷⁵

The no net loss goal paved the way for wetlands banking by creating a greater demand for mitigation. The Clinton Administration also set a no net loss goal through their Clean Water Action Plan. On December 24, 2002, the administration of President George W. Bush announced the National Wetlands Mitigation Action Plan which proposed to “further [the] achievement of the goal of no net loss by undertaking a series of actions to improve the ecological performance and results of wetlands compensatory mitigation under the Clean Water Act and related programs.”¹⁷⁶ Bush’s 2002 Plan intended to clarify mitigation guidance, integrate compensatory mitigation into the watershed context, and improve overall compensatory mitigation accountability.¹⁷⁷

Often mitigation projects either fail or do not occur at all. The policy of no net loss prefers on-site restoration or creation over restoration or creation in a different location, and a further preference for restoration or creation of same type of wetlands altered by discharge.¹⁷⁸ Although the no net loss policy impacts the Corps’ decisions regarding compensatory mitigation, the data representing gains and losses of wetlands reported by the Corps are not particularly encouraging. In 1991 for example, out of 40 mitigation projects involving wetland creation and restoration studied in south Florida, only about half of the required wetlands had been constructed and 60 percent of the projects were considered incomplete or outright failures.¹⁷⁹ Less than 5 of the 40 projects were considered a success. A study in 1992 concluded that of the Section 404 permits issued in Louisiana, only 8 percent of the drained area was compensated for, and only 50 percent of the mitigation sites were visited at least once.¹⁸⁰

In fiscal year 2003, the Corps permitted 21,000 acres of wetlands and waters to be affected across the U.S. by permitted activities and countered this by requiring over

43,000 acres of compensatory mitigation.¹⁸¹ This suggests a net gain of wetland acres. However, with unwilling and unable permittees, this number does not reflect the actual gains and losses.¹⁸² In 1990, the Environmental Protection Agency and U.S. Army Corps of Engineers signed a memorandum of agreement providing guidance on wetland mitigation. The Corps is responsible for violations and allegations of unpermitted discharges; repeat violators, flagrant violations, specific requests, or a Corps' recommendation can lead to administrative penalty actions by the EPA.¹⁸³ Violations of a Section 404 permit requirement can result in monetary and criminal penalties.¹⁸⁴ Yet regulations are hard to enforce when only half of the supposed mitigation sites are even visited. As a result, a 2001 report published by the National Research Council concluded five things about the Section 404 wetland program.¹⁸⁵ First, the goal of no net loss of wetland functions is not being met by the mitigation program enforced by the Corps, (although the report noted progress over the last 20 years). Second, a watershed approach is recommended to improve permit decision making. Third, expectations are often unclear to the permittee and compliance has often not been enforced. Fourth, the Corps has inadequate support for regulatory decision making. Fifth, the report recommends that third-party compensation approaches such as mitigation banks and in-lieu fee programs be used instead of permittee-responsible mitigation.¹⁸⁶

Mitsch and Gosselink argue that most studies call for improvement in building mitigation wetlands. They suggest two categories when judging the success of created or restored wetlands. First, there is legal success which compares "the lost wetland function and area with that which is gained by the replacement wetland."¹⁸⁷ Second, there is ecological success which compares "the replacement wetland with a reference wetland

(natural wetlands of the same type that may occur in the same setting or generally accepted ‘standards’ of regional wetland function).”¹⁸⁸ The overall success would be the combination of the legal and ecological successes.

In response to increasing wetland regulations, private property rights advocates have fought to protect the Fifth Amendment right to be justly compensated for any federal “takings.” Landowners argue that the restrictions caused by wetland protection policies inhibit or “take” their ability to earn profit from the land. In the 1985 case *United States v. Riverside Bayview Homes*, the U.S. Supreme Court ruled “assertion of regulatory jurisdiction by a governmental body does not constitute regulatory taking...” Yet, the Court added: “when denial of a permit resulted in the prevention of all economically viable uses for the land, such regulation would constitute taking.”¹⁸⁹ In 1992, the U.S. Supreme Court ruled in *Lucas v. South Carolina Coastal Council* that regulations denying a landowner all “economically viable use of land” require compensation to the landowner, regardless of the public interest provided by the regulations.¹⁹⁰ The issue in determining the need for compensation is whether or not there are other economically viable alternatives to the proposed action that is denied a permit.

The eruption by property rights advocates in the 1990s dates back to the 1960s, as landowners expressed opposition to the modern environmental movement. While the environmental movement encouraged the federal government to establish many national parks and wildlife refuges, property rights activists argued that the Fifth Amendment of the Constitution states that private property should not be taken for public use without just compensation. The Sagebrush Rebellion was a populist movement that began in

1979 when the U.S. government began to increase environmental protection on public lands in the American West. Landowners argued the federal government had no right to regulate public lands to the extent that it interfered with the land's economic viability and fought for more state and local authority over the use of these lands. Essentially, landowners used public lands for grazing, mining and other natural resources. In 1981 a U.S. District Court ruled against the state of Nevada—which originally filed suit—arguing that the state gave up its rights to control public domain when it entered the union. The public lands belonged to the federal government, not the state. People were frustrated with the federal government's opposition to resource development. Western states have abundant natural resources such as coal, natural gas, metals and timber. The states fought to have control over land use, arguing they had a better idea of what the lands should be used for than the federal government. Landowners who farmed or mined for a living on public lands were being threatened and shut down due to the federal government's new environmental policies that protected these areas. Interest groups and organized activists came together in a movement fighting for Americans' land rights in the Wise Use Movement.¹⁹¹

The Wise Use Movement, a piece of the Property Rights Movement was largely comprised of real estate developers, hunters, fishermen, and others often in opposition to environmentalists. While western states lost their skirmish in the Sagebrush Rebellion, the Property Rights Movement continued. Increased governmental spending on environmental rules and regulations in the 1970s affected many Americans. In the 1970s, Congress passed a series of environmental regulations addressing property use and ownership.¹⁹² Regulating many aspects of our lives from the food we eat and the water

we drink to the clothes we wear and the homes we live in, environmental regulations impacted Americans like never before. The Property Rights Movement fought back, complaining that environmental regulation had gone too far. The Wise Use Movement was primarily opposed to the way in which the federal government was “taking value” from private land by implementing land use regulations without compensating land owners for their perceived economic losses. Some land owners took their cases to court, others involved the media, and still others went to their state and local governments for assistance.¹⁹³ By the 1990s, the movement continued to fight for the recognition of property rights and the acknowledgment of “the importance of working together with the property owner to achieve environmental protection.”¹⁹⁴

Often, the “takings” issue in regards to wetland protection and the Fifth Amendment is inconclusive. Jody Lipford and Donald J. Boudreaux (1995) argue that, “unlike physical takings, regulatory takings do not guarantee compensation to landowners who have suffered diminution of property values as a consequence of government regulation. Further, judicial rulings are often uncertain and costly to pursue.”¹⁹⁵ Yet, in response to regulatory takings there is a growing movement to protect private property rights at the state level. By 1994, forty-two states had introduced property rights legislation (including Florida), and eleven had passed some form of legislation.¹⁹⁶ The movement continues into the current decade. For example, the people of Oregon in 2005 and Arizona in 2007 passed legislation stating that a property owner is entitled to just compensation when the value of one’s property is reduced due to state or local land use laws.¹⁹⁷

While Section 404 is the primary regulatory program governing wetlands, other federal programs and agencies have rulings that impact wetlands. Since 1990, at least thirty-six federal agencies have applied financial funding, acquisition, direct regulation, or other management techniques to help protect wetland functions and values.¹⁹⁸ Section 404 exemptions for normal agricultural and silvicultural activities allows for wetland drainage on farms and in commercial forests without permits. During the 1970s and early 1980s, a conflict of interest emerged between federal agencies as the Corps and the EPA encouraged wetland conservation while the Department of Agriculture encouraged wetland drainage by providing federal subsidies for drainage projects. To ensure wetland protection across the federal agencies Congress passed the “swampbuster” provisions of the 1985 Food Security Act stating that the federal subsidies would no longer be granted to farmers who knowingly convert wetlands into farmland.¹⁹⁹ Congress directed the U.S. Soil Conservation Service (now the Natural Resources Conservation Service, or NRCS) to help farmers identify wetlands and advise the farmers accordingly.

Congress passed the North American Wetlands Conservation Act (NAWCA) in 1989 to provide grants to public-private partnerships for wetland conservation projects in North America. The program is funded by federal excise taxes, Migratory Bird Treat Act funds, and interest earned on various federal accounts. These grants require that each federal dollar is matched by other government agencies or private sources. The NAWCA has funded over 20 million acres of wetlands conservation in over 1,600 projects throughout North America, including Mexico and Canada. From the establishment of the

Act through March 2007, more than \$790 million in federal dollars have been invested through the NAWCA.²⁰⁰

Several federal actions were taken toward protecting wetlands in the 1990s. In 1990, Congress passed the Coastal Wetlands Planning, Protection and Restoration Act. This Act encouraged the U.S. Fish and Wildlife Service to engage in interagency wetlands restoration and conservation planning, and expanded federal grants to restore, enhance, and acquire coastal wetlands. Then, in 1991 the U.S. Department of Agriculture's Natural Resources Conservation Service implemented the Wetlands Reserve Program to protect wetlands on private property on a voluntary basis. The Wetlands Reserve Program called for the acquisition of federal easements on up to one million acres of agricultural land that was formerly wetland.²⁰¹

In the summer of 1993, the administration of President Bill Clinton released "Protecting America's Wetlands: A Fair, Flexible, and Effective Approach," the Interagency Wetlands Plan reaffirming no net loss and Section 404 of the Clean Water Act. The Plan assigned NRCS as the lead agency responsible for identifying wetlands in agricultural areas under both the Clean Water Act and the "swampbuster" provisions of the Food Security Act.²⁰² The plan also called for an increase in the quantity and quality of wetlands in the United States. Furthermore, the plan encouraged non-regulatory practices to protect wetlands (e.g. private restoration programs), to decrease the reliance on the Section 404 program, and to support public-private cooperative efforts and research and inventory activities.²⁰³ The plan changed the 404 permit process by establishing a ninety-day deadline for Corps action on permit applications and an appeals process for Corps actions. It also minimized the level of permit review required for

smaller projects causing only minor environmental impacts.²⁰⁴ The U.S. Fish and Wildlife Service, Natural Resources Conservation Service, U.S. Army Corps of Engineers, and Environmental Protection Agency agreed to this in a memorandum in early 1994.²⁰⁵

In 2001, the U.S. Supreme Court's *SWANCC* (*Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers*) decision marked an important point in the path of federal wetlands protection. In this case, the Supreme Court examined the relationship between isolated, intrastate wetlands and water bodies and intrastate navigable waterways. Based on the Migratory Bird Rule, the Corps argued that particular migratory bird habitats needed protection under Section 404 because the birds generated interstate tourism (a form of interstate commerce, which the Constitution gives the federal government the authority to regulate).²⁰⁶ According to Gross and Dodge, the "Court ruled the Corps had stretched its outer limits of power and [the Court] would not assert jurisdiction under the Clean Water Act."²⁰⁷ It is now arguable that the *SWANCC* ruling limits the jurisdiction of Section 404 to wetlands adjacent to navigable waters. Gross and Dodge add that "others have interpreted *SWANCC* to exclude only those wetlands that have no hydrological connection to available water."²⁰⁸ Oftentimes manmade structures such as levees can obscure the proximity of wetlands to navigable waters. In recognizing a previous court decision (1985 *United States v. Riverside Bayview Homes, Inc.*) that based Corps' jurisdiction of non-navigable wetlands on a "significant nexus" between wetlands and other navigable waters, the *SWANCC* Court ruled the Corps did not have the authority to regulate non-navigable, isolated, intrastate

ponds.²⁰⁹ However, the Court explicitly refused to clarify the Corps' specific and precise extent of jurisdiction.²¹⁰

President George W. Bush announced a goal to achieve a net gain in wetlands in 2004. Some reports show that government regulation did appear to slow the rate of wetland losses. The rate of wetlands destruction decreased from 290,000 annually in the mid-1970s to 58,500 acres annually in the mid-1980s, representing an 80% decrease.²¹¹ Between 1998 and 2004 wetland area increased by an average of 32,000 acres annually, mostly due to regulatory and non-regulatory restoration programs.²¹² Gross and Dodge attribute current wetland losses to urban development (30%), agriculture (26%), mining (23%), and rural development (21%).²¹³ When examining the state of wetlands over the past century, it is possible that federal regulations have played a role in protecting our nation's wetlands. However, declining wetland losses over time may reflect a reduced number of wetlands that could be converted.

Aldo Leopold argued in 1949 for a widely accepted ethic dealing with the relationship between man and land, as well as animals and plants.²¹⁴ As long as economics dominate our relationship to land, he contends the relationship will be largely influenced by privileges gained from the land, and not our obligations and responsibility towards the planet. From a community standpoint, he suggests: "the land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land."²¹⁵ His land ethic would change our role from a "conqueror" to a "citizen" that respects its fellow members.²¹⁶ Leopold considers conservation to be a "state of harmony between man and land."²¹⁷ He argues that the slow pace of progression toward this state of harmony is due not to the quantity of environmental

education provided in our schools and public park systems, but the content of this education. Mid-twentieth century conservation education, he contends, “defines no right or wrong, assigns no obligation, calls for no sacrifice, implies no change in the current philosophy of values.”²¹⁸

While over a half century old, Leopold’s message of harmony with, and obligation to our land-community still holds truth and value in our relationship with wetlands and other natural environments today. Applicants submit Section 404 applications for permits to degrade wetlands in order to profit from their land. The Corps then approves permits under conditions specified in writing that generally call for improvements to nearby wetlands on at least a 1:1 ratio. That is, an applicant must restore, create, preserve or otherwise mitigate at least one acre of wetlands for each acre of wetlands degraded by the permitted activities. Yet, this creates merely an illusion that we are doing something right for the land and waters when the intended compensatory restoration, preservation, or mitigation projects either fail or never get off the ground to begin with. The ultimate outcome generally tends to be “development.” This outcome has led to an increase in state and local wetland regulations as well as an influx in membership in private and non-profit organizations. As Leopold calls out for a land ethic that views humans as citizens of the land, not conquerors—a modern environmental writer on wetlands comments:

“Ideally, the [government wetlands permitting] system will reflect the dynamic balance of federalism, achieving a streamlined permitting system that effectively protects wetlands, allows for appropriate development and resource use, and remains responsive to regional and local concerns, while also being applied relatively uniformly across the states.”²¹⁹

This ideal is not far from the ideal expressed over thirty years ago in the Clean Water Act to restore and maintain water quality and the integrity of waters in the United States.

Sadly, we have a long way to go regarding Aldo Leopold's land ethic.

Chapter 6

State-Level Wetland Regulations

State legislatures experience many pressures from environmental lobbyists, private and not-for-profit organizations, and other public voices, encouraging the state government to take steps toward improving and enhancing wetlands and water quality. While public voices may create enough of a demand to take regulatory action, the U.S. Environmental Protection Agency (EPA) offers funding, programs, guidelines, plans, and resources to help make state wetlands action possible. For example, upon a Governor's request, the CWA requires the U.S. Fish and Wildlife Service to assist states in developing and implementing regulatory programs to control the discharge of dredged and fill materials.²²⁰ State wetland protection programs began to emerge around the time the modern environmental movement surfaced. In 1963, Massachusetts was the first state to require a permit for fill and structures in coastal wetland areas. By 1978, thirteen states required a permit for such activities and five states had adopted inland wetland protection acts.²²¹ Florida has roughly 11.4 million acres of wetlands and has extensive regulatory programs in place with the goal of no net loss within the state.²²² Still, Florida struggles with the constant battle between land developers, farmers, and environmentalists to achieve balance between economic interests and ecological sustainability.

Through grant funding from the EPA, the Environmental Law Institute (ELI) studied seven components of state wetland programs published in four phases using data collected between 2003 and 2006.²²³ The seven components are: state laws, regulations, and programs; monitoring and assessment; restoration programs and activities; water quality standards; public-private partnerships; coordination among state and federal agencies; and education and outreach activities.²²⁴ The ELI designed four phases, each phase studied 12-13 states and represented a cross-section of geographic diversity and various approaches to wetlands protection.²²⁵ The ELI concluded that wetlands were either explicitly or implicitly included in every states' definition of "state waters."²²⁶ There are a number of ways states protect and regulate wetlands. Michigan and New Jersey chose to implement the Section 404 permitting program, some states protect wetlands with water quality programs, some have state-wide permitting programs and other states have laws mandating local governments to regulate and protect local wetlands.²²⁷

In Phase IV, ELI compared the results of the seven components in all fifty states. While this final phase of the ELI study does not provide numeric representation of the differences of the 50 states' involvement with wetlands, the study offers a general picture of state trends. Some states have specific laws, others have broader regulatory programs. Some have permit programs for dredge-and-fill activities, and other states have an agency that administers regulations but not necessarily a permit program.²²⁸ Mitigation regulations are also examined. ELI reported that many states did not have mitigation provisions outside of the Section 404 provisions. These states generally defer compensatory mitigation issues to the Corps. Some states, however, have established

specific ratios, site preferences, and other mitigation guidelines, and a few state resource agencies have established either mitigation banks or in-lieu fee programs.²²⁹ According to the ELI, “an in-lieu fee program is an agreement between a regulatory agency (state, federal, or local) and a single sponsor, generally a public agency or non-profit organization.”²³⁰ A mitigation sponsor collects in-lieu fees from numerous developers or other permittees and uses the funds for wetlands mitigation projects. In-lieu fee mitigation generally takes place after the permitted activity and its impacts take place. This allows the permittee to avoid the burden of completing a wetlands mitigation project. Most states do not have a formal system for monitoring and assessing wetlands or state-established water quality criteria separate from those required by the CWA.²³¹ According to the ELI study, most states in one way or another were involved with restoration projects and educational and outreach programs. However, only six states (Florida is not one of them) have a formal, wetland-specific education or outreach program.²³² Oftentimes, a state will instead have a more broad environmental education program that includes wetlands as a component.²³³ ELI also concluded that every state has some level of coordination with other state and federal agencies regarding permit applications, project reviews, and conservation and agricultural programs.²³⁴

Florida has a long history of developers hoping to convert Florida’s mosquito-filled, hot and humid swamplands into a tropical paradise and money-making oasis. Florida’s lands were sought out by inspired entrepreneurs, governors, and even presidents. In the late nineteenth and early twentieth centuries developers and other hopefuls suffered failures due to the lack of funding and technology. Perhaps at first, the task appeared manageable, but they all soon realized that wild Florida was very difficult

to tame. It would take more than some bulldozers, handy workers, and a couple of years to convert Florida into the Florida dream. Hamilton Disston, Henry Flagler, and Henry Plant were among the early speculators who made significant marks on the state through drainage canals, resorts, and railroads. The state's Internal Improvement Fund helped make conversion projects a possibility through project funding and swamp land giveaways. The early idea of "internal improvements" was not to protect land, but to build canals and railroads among other development.²³⁵ Through the first half of the twentieth century, the Division of State Lands maintained the IITF and its goals to "improve" lands for human use.

The Internal Improvement Board, created in 1851, and was Florida's first environmental program. The Board was quickly replaced by the Trustees of the Internal Improvement Trust Fund (IITF) in 1855, operated by the Division of State Lands and managed by the Secretary of Agriculture and the Governor. The IITF's lands came from the Great Pre-Emption Act of 1841 which gave each new state 500,000 acres for internal improvements; and the Swamp and Overflowed Lands Act of 1850 (Swamplands Act), which granted Florida 20,325,013 acres. Initially, the IITF sold lands specifically to railroad companies, but the lack of funding led the IITF to sell lands at a very low price to essentially any developer—some lands were sold for just pennies per acre.²³⁶ The IITF earmarked money gained from the land "giveaway" (following the Swamplands Act) to guarantee railroad construction bonds.²³⁷ When the railroad industry plummeted after the Civil War, demands for bond payments and a lawsuit against the IITF put the IITF nearly \$1 million in debt. In 1881 Hamilton Disston offered nearly \$1 million to Florida for 4 million acres of swamplands, saving Florida's IITF from bankruptcy.²³⁸

The dredge and fill development that swept the state over the course of the twentieth century was full of ups and downs, stops and gos, roads and floods. One could argue whether or not Florida's dream paradise was ever attained. In the midst of the hustle and bustle of construction and land development, the main actors in the paradise dream were beginning to disappear. The wildlife and vegetation that initially helped to make Florida so appealing declined rapidly. In the 1930s, the Civilian Conservation Corps, a federal program developed under President Franklin Roosevelt, came to Florida to wipe out all the undesirable plants from public lands. The program also altered land for the purposes of flood control, insect control, and built or maintained paths, tracks, and fire lanes on public lands across the state.²³⁹ The CCC took part in destruction of Florida's ecosystems by converting wetlands to other uses through draining and ditch building.²⁴⁰ The conversions threatened native plant and animal species that were perhaps viewed as unattractive, uninviting, or dangerous to humans in Florida. Hunting and poaching alligators, water birds, and other animals added to the significant human impact on Florida.

At long last, environmentalists began to stand their ground in Florida, fighting to protect our state's precious lands. As Florida's wetlands and freshwater supply dwindled, the state began to listen to environmentalists' concerns. Florida's population more than doubled between the 1950s and 1970s.²⁴¹ The 1970s marked a period of transformation for the Division of State Lands most likely due to the increased awareness of decreased water quality and land availability. With the population increase and wetland decrease, the state's water supply came under greater strain, and in 1970-71 Floridians found themselves rationing water supplies because of a severe drought.²⁴² Recall that in 1972,

the federal government took action through the creation of the Clean Water Act. Florida subsequently created the Department of Environmental Regulation in 1975.²⁴³ This was not, however, the initial attempt by Florida's legislature to develop an environmental program.

Prior to Florida's Governmental Reorganization Act passed in 1969, numerous agencies controlled various aspects of the state's lands including the Outdoor and Recreational Development Council, the Board of Drainage Commissioners, the Florida Board of Conservation, the Canal Authority, the Suwannee River Development Authority, the State Park Service, and the Game and Fresh Water Fish Commission.²⁴⁴ Under the 1969 Act, the Department of Natural Resources was created to take over most of the duties of the various agencies, eliminating the need for all but the Game and Fresh Water Fish Commission (which was later merged with the Marine Fisheries Commission to create the Fish and Wildlife Conservation Commission).²⁴⁵ In 1975, the Legislature created the Department of Environmental Regulation (DER). The DER became the head agency over the state's five Water Management Districts and all other agencies that dealt with pollution.²⁴⁶ In 1979, the legislature passed an act putting the Division of State Lands within the Department of Natural Resources, "responsible for acquisition, administration, and management of state lands for the Department."²⁴⁷

Florida continued to seek a solution for better management of the state's environmental programs. In 1972, the state established the Environmentally Endangered Lands Acquisition Program (EEL) enabling Florida "to purchase endangered or environmentally damaged areas for use as natural resource preserves and/or recreation areas."²⁴⁸ The EEL transitioned into the Conservation and Recreation Lands (CARL)

program in the late 1970s and early 1980s. The legislature created CARL to purchase lands containing naturally occurring plants and animals; habitats critical for endangered or threatened species; unique geological features; and to acquire lands to enhance, protect, restore, or preserve lands and waters for the public interest.²⁴⁹ In 1984, Florida's legislature passed the Warren Henderson Wetlands Protection Act requiring permits for any dredging and filling of Florida's wetlands for the first time.²⁵⁰ The Act established guidelines for defining wetlands and required the state to consider mitigation projects before issuing a dredge and fill permit. The Henderson Act also required applicants' activities to meet the state's water quality standards and a public interest test.²⁵¹ The Department of Environmental Regulation (now called the Department of Environmental Protection) was responsible for considering public health and safety, fish and wildlife conservation, navigation, recreation, and historical or archeological significance when determining whether to issue a permit.²⁵²

On a federal level, the Fish and Wildlife Service added about 250,000 acres to the National Wildlife Refuge System in Florida during the 1980s alone—most of which were wetlands.²⁵³ Also in the 1980s, the National Park Service gained authorization to acquire almost 250,000 acres of wetlands in the East Everglades and Big Cypress Swamp.²⁵⁴ The U.S. Forest Service acquired between 60,000 and 90,000 acres near Osceola National Forest, and Florida purchased over 500,000 acres of wetlands.²⁵⁵ Still, wetland losses continued and it was clear that Florida's wetlands needed more protection.

There are several ways states can take regulatory action to protect wetlands, many of which are encouraged and even funded by the federal government. According to Section 404 of the Clean Water Act, states are authorized to take control of the 404

permitting process upon the EPA's approval. Only Michigan and New Jersey have assumed this authority.²⁵⁶ Other states have not chosen this path because of the EPA's extensive requirements and the inability to meet specific regional needs such as protecting non-navigable waterways or unique natural resources.²⁵⁷ The Corps may also choose to issue state programmatic general permits (SPGPs) in cases where specific activities are regulated in a state permit program to an equal or greater extent than Section 404 requires. The activities must be similar in nature and have only minimal effects on the environment (e.g. single-family docks, construction or restoration of seawalls, canal and channel maintenance).²⁵⁸ SPGPs minimize the hassle for applicants that may otherwise have a duplicate process applying to both state and federal permit programs.²⁵⁹ Regarding water quality, states are required by Section 303 of the CWA to adopt water quality standards that are at least as stringent as federal standards.²⁶⁰ While many states have included wetlands within the definition of "state waters," few have specific water quality standards for wetlands.²⁶¹

The EPA provides both technical assistance and funding for wetland programs (including but not limited to state assumption of Section 404 enforcement) through Wetland Program Development Grants to state and tribal governments. The EPA also encourages states and tribes to adhere to six elements under their Comprehensive Wetlands Program.²⁶² These six elements are as follows. First, the EPA asks each state and tribe to establish wetland regulations that are at least as strict as Sections 404 (waters and wetlands) and 401 (water quality) of the CWA. Second, states and tribes should also monitor and assess the quality and quantity of their wetlands. Third, there should also be programs in place for improving wetlands through restoration, enhancement, and

increased water quality. Fourth, state/tribal wetland programs should adopt EPA approved wetland water quality standards. Fifth, public-private partnership programs are encouraged to enhance wetland resources. Finally, state and tribal governments should ensure coordination between various agencies that deal with wetlands and wetlands-related issues.

While the Florida Department of Environmental Protection (FDEP) and the state's water management districts (WMDs) are responsible for some Section 404 general permits, complete delegation of Section 404 enforcement has not yet been granted to the state of Florida. The state never formally applied for assumption of the Section 404 program, but formally explored the possibility in the late 1980s, again in 1992-95, and once more in 2000.²⁶³ An EPA-issued Wetland Program Development Grant funded the 1992-95 effort and resulted in the state's SPGP program, allowing applicants to apply to the state for Corps-approved Section 404 general permits.²⁶⁴ In 2005, the FDEP developed a Consolidation of State and Federal Wetland Permitting Programs designed to implement House Bill 759 requiring the department "to consolidate, 'to the maximum extent practicable,' federal and state wetland permitting programs."²⁶⁵ Later that year, the Florida legislature passed Florida Statute 373.4144 directing the Department of Environmental Protection to implement the program.²⁶⁶ The intent was that dredge and fill activities effecting wetland areas of 10 acres or less would be processed using an environmental resource permitting program that encompasses state and federal requirements.

A report prepared by the FDEP's Office of Submerged Lands and Environmental Resources states several reasons to not pursue Section 404 assumption.²⁶⁷ Most of

Florida's waters are non-assumable under Section 404 due to their lack of connection to navigable waters. Moreover, Florida's method of delineating wetlands and other surface waters differs from the federal method, and some inland wetlands would be significantly impacted by a change in assumption. For instance, non-navigable wetlands protected by the state are not protected by the federal government. Conversely, the federal wetland classification uses slash pines and gallberries as wetland indicator species, but Florida considers them neutral (neither upland nor wetland) species.²⁶⁸ Some of the differences in legislation that would go along with assumption of Section 404 powers would potentially require federal legislative changes and a change in state legislation.²⁶⁹ The federal statutory changes include requiring the Corps to continue enforcing and monitoring modifications to any previously issued Corps permits, including Clean Water Act general permits; removing the "clean break" provision requiring the Corps to finish processing any pending applications at the time of transfer; and removing the five-year limitation on state-issued Section 404 permits because Florida has a 25-year permit program that includes a five-year review cycle.²⁷⁰

Florida's likely statutory changes include returning FDEP as the state's leading agency for wetland permitting with authority to modify, revoke, or rescind permits currently issued by WMDs; revising state law to include consideration of project alternatives (e.g. accounting for economic considerations); and removing the automatic "default" issuance of permits that are not processed within the state's 90-day limit for permit review.²⁷¹ It would probably take a significant amount of time for both the federal and state legislatures to pass the needed changes, which may deter the state and EPA from following through. However, if the consolidation of the two programs results in

drawing the more protective characteristics of each into a single program, perhaps it would be worth the assumption of powers. Indeed, the FDEP is working on its third attempt in the past 20 years to assume the Section 404 permitting responsibilities. Janet G. Llewellyn, Assistant Director of the FDEP Division of Environmental Resource Permitting describes Florida's ongoing process in a federal Senate subcommittee hearing in 1995: "Florida has been undertaking an ambitious initiative to streamline its wetland and surface water programs with the goal of reducing duplication, red tape, and delays for applicants, but without reducing environmental protection."²⁷² This 1995 testimony is still being referenced in this year's discussion of state assumption of the Section 404 program.²⁷³

Florida was among the 12 states studied in the second phase of the ELI's state wetland study.²⁷⁴ Florida stood out particularly strong relative to the other states in the category of 'restoration and partnerships.' Florida's wetland regulatory program is administered on a state and regional level, and has a no net loss of acreage goal and similar (but not identical) delineation criteria to those used by the Corps. Florida is divided into five Water Management Districts (WMDs) and four of these five WMDs are responsible for the state's Environmental Resource Permit Program.²⁷⁵ The Northwest Florida WMD (in the panhandle) currently uses an outdated Wetland Resource Permit Program implemented by FDEP regulating dredge and fill activities. It does not include the regulation of activities in lakes or isolated wetlands under 10 acres that the new program includes.²⁷⁶ It is expected that the Northwest Florida WMD will use the new program developed in 1995 (which the other four WMDs already use) by the year 2010.²⁷⁷ The Environmental Resource Permit Program regulates landscape alterations

including tidal and freshwater wetlands. It also regulates dredge and fill activities, stormwater treatment, flooding, and upland alterations.²⁷⁸ In enforcing these activities, Florida may use abatement/ compliance orders and injunctions, civil penalties and prosecution, and criminal penalties and prosecution.²⁷⁹ The Florida permitting program is not mere duplication of the federal government's Section 404 program. Florida delineates wetlands slightly differently than the Corps and protects non-navigable wetlands not protected under federal legislation. Florida also does not allow applicants to apply for mitigation in an initial application, while the Corps will consider mitigation before an applicant makes any attempt to avoid or even minimize their planned impacts to wetlands.

There are other programs in place to help improve the conditions of wetlands in Florida. Both the state and federal government are spending billions of dollars in restoring the Everglades, the Kissimmee River and associated floodplain wetlands. Another \$300 million in state and federal funds are spent annually for land conservation, acquisition, and management under the Florida Forever program.²⁸⁰ Florida's SWIM Program (the Surface Water Improvement and Management Program), which is intended to repair degraded surface water bodies, and the state's invasive plant management program both play a role in Florida's wetland restoration programs.²⁸¹

Florida's relatively well-funded and regulated wetland programs are what set it apart from other states. Unfortunately, so do Florida's wetland losses. By the 1970s, only about 11 million acres of the original estimated 20 million acres of wetlands remained in Florida.²⁸² The total net loss of wetlands between the 1970s and 1980s equaled 260,300 acres, an annual average of 26,030 acres of wetlands.²⁸³ It is important

to note that palustrine wetlands suffered the greatest loss.²⁸⁴ Palustrine wetlands are vegetated, small, inland bodies of water less than twenty acres in area and no more than two meters deep, generally called ponds. These smaller wetlands are often not protected because of their perceived lack of function. Yet, palustrine wetlands offer habitats for plants and animals and provide relief from floodwaters during severe flooding from nearby lakes and rivers.²⁸⁵ As at the national scale, agriculture, urban development, and other forms of development are to blame for the conversion of wetlands to other uses. Agricultural areas increased by 528,500 acres and urban areas increase by 551,600 acres in the Sunshine State, but only 66,000 acres of the urban areas were converted *directly* from wetlands—most were converted from agricultural lands that were once wetlands.²⁸⁶ Thomas Dahl reported in 2005 that Florida has approximately 11.4 million acres of wetlands, representing a net increase in quantity.²⁸⁷

Florida's wetland acreage reports can be misleading. The state's Department of Environmental Protection reported the following data for wetland impacts between 1984 and 1995: 7,476 acres permanently destroyed, 10,071 acres temporarily destroyed, 22,195 acres preserved, 39,131 acres created, and 204,895 acres improved (accounting errors suggest this may actually be only 28,584 acres improved). However, the figures do not account for a number of effected wetlands.²⁸⁸ Losses from exempt activities, general permit activities such as agricultural activities, unauthorized dredging and filling, whether the permitted actions including mitigation were ever implemented, or degradation from exotic infestation, drainage, impoundment, or wetlands in need of restoration were not included.²⁸⁹

The 1993 Florida Environmental Reorganization Act initiated the Environmental Resource Permit program (ERP program) to regulate activities dealing with stormwater, tidal and freshwater wetlands and other connected and isolated surface waters.²⁹⁰ The Florida Forever land acquisition program established in 1999 is the largest conservation land buying program in the world.²⁹¹ The program allows for \$3 billion in bonds for acquiring state lands over a ten-year period. Through 2006, the program has contributed \$1.8 billion toward the protection of over 530,000 acres of land, including 236,210 acres of functional wetlands in Florida.²⁹² Passed by 72 percent of Florida's voters, the program was a response to an overwhelming public demand to protect state lands. The program funds land acquisition by the five WMDs, Division of State Lands, Division of Recreation and Parks, Rails to Trails, Florida Recreation Development Assistance Program, Florida Fish and Wildlife Conservation Commission, Department of Community Affairs, and Department of Agriculture and Consumer Services, Division of Forestry.²⁹³ Florida Forever is updated annually and now includes the Save Our Rivers and Preservation 2000 programs. The program has also pressured the Division of State Lands to develop better and more accurate mapping and delineation methods in response to the demands for public lands.²⁹⁴ The program was also a response to the role the Corps has played in Florida, approving more wetland permits in Florida than in any other state. According to the *St. Petersburg Times*, the Corps rejected only one permit to degrade wetlands out of over 12,000 permit applications between 1999 and 2003 (approving the rest).²⁹⁵

“Wetlands” are defined by the state Statutes as (adopted in the 1995 Florida Water Plan):

areas that are inundated or saturated by surface water or groundwater at a frequency and a duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils. Soils present in wetlands generally are classified as hydric or alluvial, or possess characteristics that are associated with reducing soil conditions. The prevalent vegetation in wetlands generally consists of facultative or obligate hydrophytic macrophytes that are typically adapted to areas having soil conditions described above. These species, due to morphological, physiological, or reproductive adaptations, have the ability to grow, reproduce, or persist in aquatic environments or anaerobic soil conditions. Florida wetlands generally include swamps, marshes, bayheads, bogs, cypress domes and strands, sloughs, wet prairies, riverine swamps and marshes, hydric seepage slopes, tidal marshes, mangrove swamps and other similar areas. Florida wetlands generally do not include longleaf or slash pine flatwoods with an understory dominated by saw palmetto. Upon legislative ratification of the methodology adopted pursuant to s. 373.421(1), as amended, the limitation contained herein regarding the purpose of this definition shall cease to be effective.²⁹⁶

Florida has an abundance of wetlands and wetland types including all five major types of wetlands systems: Marine, Estuarine, Riverine, Lacustrine, and Palustrine. The Wetland Resource Permitting Program (WRP Program) was authorized in 1984 pursuant to the Warren S. Henderson Wetlands Protection Act.²⁹⁷ The WRP Program and Florida's administrative code and statutes protect wetland areas through the Mangrove Trimming & Preservation Act (1996), water quality standards, specific rules and procedures for permits and dredge and fill activities, regulation of stormwater discharge, and 25-year permits for maintenance dredging in deep water ports.²⁹⁸

Florida's permit program is similar to the Section 404 permit program of the Clean Water Act administered by the U.S. Army Corps of Engineers. Unless the activity is specifically exempt, all actions affecting wetlands and other surface waters require a state permit, including dredging, filling, and construction of structures.²⁹⁹ The permit program also includes dredging channels, canals, ditches and lakes; depositing fill;

constructing docks, piers, boardwalks, platforms, artificial reefs; or other activities in or connecting to jurisdictional waters.³⁰⁰ As of July 1, 1994, Florida's jurisdiction "delineates the landward extent of all wetlands and other surface waters, including isolated wetlands" throughout the state; except in the panhandle where the permit program is not yet in effect.³⁰¹ While some activities are exempt from the permit program, all projects must meet water quality standards throughout the project and may still need authorization under other federal, state, or local regulations.

Like the Section 404 program, Florida issues individual and general permits. Individual permits are required for any activity not covered by the general permits. Permits are generally issued for five years, but may be issued for up to twenty-five years. An applicant may decide to meet with the Florida Department of Environmental Protection before submitting their permit. Florida collaborated with the Corps to develop a joint application process that covers the federal and state application requirements. An applicant submits their application to the appropriate WMD; the District then submits a copy of the application to the Corps. The District reviews and processes the application independent of the Corps. Generally, the Corps waits until the state or WMD makes an authorization before issuing a permit because the applicant must first meet Florida's water quality standards.³⁰²

Florida considers water quality, public interest, and cumulative impact when reviewing an application. The state uses a uniform mitigation assessment methodology (UMAM) by calculating "the amount of functional loss of impacted wetlands and amount of proposed functional gains produced by mitigation wetlands."³⁰³ The District may propose mitigation if it decides that the project will have adverse effects on wetlands or

other surface waters, and the applicant is unable to meet the permitting criteria.³⁰⁴

Except for mining applications, Florida does not allow mitigation to be considered in the initial application process.³⁰⁵ It must first be determined whether or not a project is eligible for a permit. The WMD first considers practicable alternatives and minimization of adverse effects, and only if no practicable alternative exists will they suggest compensatory mitigation. Mitigation proposals can include any one or a combination of:

- Restoration of wetlands or other surface waters
- Enhancement of wetlands or other surface waters
- Creation of wetlands or other surface waters
- Preservation of wetlands and other surface waters
- Net improvement of water quality or aquatic habitat.³⁰⁶

Like the federal program, on-site mitigation is preferred, but off-site mitigation will be considered if there are significant long-term values to the mitigation project.³⁰⁷

Mitigation banks and in-lieu fee programs are also used in Florida upon program approval by the FDEP or the appropriate WMD.³⁰⁸ Mitigation is generally not considered by the state in potential cases of significant degradation to Florida's waters, when endangered species are put at risk by the project, or if proposed mitigation is likely to fail.³⁰⁹ An applicant must also provide 100 percent financial assurance of the estimated cost of the mitigation proposal by providing proof of financial resources when the estimated cost of mitigation is \$25,000 or more.³¹⁰

The Southwest Florida Water Management District (SWFWMD) is responsible for overseeing wetlands activities in 16 Florida counties, including Hillsborough County bordering the eastern side of Tampa Bay. This does not include the permits for activities within the district that must be approved or denied directly through FDEP. The FDEP is generally responsible for reviewing permits for projects having complex issues such as

projects that also need a waste treatment or management permit, mining projects, power plants, communication lines, natural gas activities and facilities, docking facilities, government navigational dredging projects, and high speed rail facilities.³¹¹ All other (standard) permit applications are directed to SWFWMD. Under the Florida Forever program, SWFWMD receives over \$26.5 million a year for projects initiated through the program.³¹² Aside from statewide programs, SWFWMD runs numerous projects and programs. For example, the Adopt-A-Pond program encourages groups to restore or rehabilitate stormwater ponds. The Aquatic Plant Management program is designed to minimize invasive species. The FARMS program provides incentives to farmers who install and maintain irrigation best management practices. These are just a few of the 17 local and statewide programs and projects SWFWMD implements. As of August 29, 2008 SWFWMD has 255 permits pending review.³¹³

Craig Pittman and Matthew Waite, award winning environmental journalists for the *St. Petersburg Times*, launched a special series on wetlands in 2005 titled: “Vanishing Wetlands.” In this nine-part series, Pittman and Waite explore wetland losses in Florida. They begin by addressing the issue of wetland data in Florida. The National Wetlands Inventory (NWI) was created in 1976 with the purpose of mapping wetlands in the United States. While Florida’s wetlands are mapped, much of the data is more than twenty years old.³¹⁴ The NWI data serves as an approximation of wetland boundaries and is not intended for jurisdictional purposes. Pittman and Waite revealed a flaw in the Corps’ permitting program, and perhaps the Corps’ relationship with “big business.” For instance, Wal-Mart applied for a nationwide permit claiming only one-tenth of an acre of wetlands would be affected within the St. Johns River WMD boundaries, when in fact 10

acres would be impacted by the project (as determined by the WMD). The Corps was later sued for ignoring the cumulative impact on Florida, and is now required to perform a study examining the long-term impacts of the Corps permit program on wetlands in Florida.³¹⁵ Cumulative impacts are a pressing concern, but they are given little attention by the Corps. On no-net-loss the *St. Petersburg Times* reports that from 1990 to 2005, Florida lost nearly 85,000 acres.³¹⁶ A recently retired Corps employee told reporters the Section 404 program is simply a “make-believe program” and that “mitigation is a fraud.”³¹⁷ Florida’s permitting program has offered little more protection than the federal program in terms of mitigation projects and permit denials. In late 2005, Jeb Bush released his plan to spend an additional \$3 billion on top of the original proposed \$10 billion of federal and state money to speed up the state’s road building projects.³¹⁸ Thousands of acres of wetlands will be destroyed in the process. Pittman reports:

The DOT destroys more wetlands than any other state agency. When the DOT has tried to make up for the damage by creating wetlands, the agency has run into expensive problems. When it has paid other agencies to do the work, the money has been spent on projects with only a tenuous connection to balancing out wetland losses.³¹⁹

Florida’s Secretary of the Department of Transportation, Denver Stutler, argued that transportation is the backbone of our economy and that we cannot afford environmental protection if our economy is not strong.³²⁰ Apparently Stutler thinks we must destroy wetlands in order to protect them!

There are at least 100 environmentally-concerned organizations in Florida ranging from well-organized national societies like the Sierra Club with branches throughout Florida to county-wide programs like Keep Hillsborough County Beautiful, Inc.; from neighborhood initiatives such as the Earth N’Us Farm in Little Haiti, Miami to groups

that cross international boundaries like the ReefKeeper International or the Florida Caribbean Chapter of the American Bamboo Society. Florida is a place with unique habitats, landscapes, creatures, and even a threatening number of exotic species. For some, Florida is also a place to escape to, a retreat to a tropical paradise.³²¹ The same lands some value as unique and natural are the ones others want to build homes and malls on, and others want to use for recreational activities.

Despite so many special interest groups for and against wetland conversion to urban and agricultural uses (and regional differences within the state) Florida does have a progressive and arguably successful system of managing wetland resources. William Mitsch and James Gosselink suggest that *states* are more likely to be successful in wetland protection programs than local governments for the following reasons:

1. Wetlands cross local governmental boundaries, making local control difficult.
2. Wetlands in one part of a watershed affect other parts that may be in different jurisdictions.
3. There is usually a lack of expertise and resources at the local level to study wetland values and hazards.
4. Many of the traditional functions of states such as fish and wildlife protection are related to wetland protection.³²²

Yet others argue that local protection is necessary to ensure the highest quality of management and supervision. This is evidently a concern as twenty counties in Florida have opted to develop countywide wetlands programs separate from the state's program. Hillsborough County is one of the counties that decided to develop their own wetlands protection rules. The following chapter will demonstrate the battles between the Corps, state, and county officials, developers, environmentalists, and citizens in Hillsborough County as a case-study on wetlands protection.

Chapter 7

A Case-Study on Wetlands Protection in Hillsborough County, FL

The U.S. Army Corps of Engineers and Florida Department of Environmental Protection shape their wetlands protection programs around budgets and pressure from citizens. Local governments are similarly shaped by demands specific to the community. One could argue that the public can more effectively shape county policies than state or federal policies. Some argue that county wetland programs in Florida waste taxpayers' money and simply duplicate state and federal regulations.³²³ Others are concerned with extra fees and delays that burden applicants with a county program.³²⁴ Still, others demand their local government provide extra protection and local oversight of wetland use. Many county wetland programs in Florida developed in the 1980s and 1990s.³²⁵ There are currently twenty counties that have a wetlands regulation program separate from the state.³²⁶ Many other counties address wetlands protection in their county plans or codes.³²⁷ Hillsborough County provides an excellent example of the wetland conversations that localities across the state and nation are involved in. Hillsborough's residents have contributed to the conversations of the county's Environmental Protection Commission (EPC) regarding these ecosystems.

In this chapter I address the role of Florida counties in wetlands protection, the history of Hillsborough County's EPC and its Wetlands Management Division, the permitting controversy that arose in the summer of 2007, and the role of Hillsborough

County's Wetlands Management Division (hereon addressed as "the Division") today. I conducted surveys and interviews of county level officials in Hillsborough and elsewhere, asking a series of questions in hopes of better understanding the possible impact local government's can have on wetlands protection in Florida.

Counties in Florida demonstrate various approaches to local wetlands protection. Florida Statute 373.441 provides the option for counties to assume the state Environmental Resource Permit program (which includes wetland use permitting) if the local government is financially, technically, and administratively capable.³²⁸ By the end of fiscal year 2007, only Broward County assumed the state Environmental Resource Permit program.³²⁹ However, Hillsborough County applied for assumption of the single-family permit portion of the state program. Some counties have a separate permitting process from the state, requiring applicants to apply to both the state and local permit programs. Hillsborough County combines the state and county permit application to make the application process easier. Counties that do not have local wetland permitting have the opportunity to provide feedback to their Water Management District (WMD) which has state jurisdiction, or to the FDEP in the panhandle.

In September 2008, I administered a survey combining open-ended and closed-ended questions directed toward county officials most familiar with local wetlands protection. (See Appendices A, B, and C for the survey and tables of results.) The survey was sent to every county office in Florida. Of the 67 counties, 34 surveys were returned. The response rate of 51 percent may create a bias in the counties that chose to respond (e.g. less busy, no program or an extensive program, local pressures to respond to the public). Lack of time or interest, lost surveys, surveys addressed to the wrong person, or

other work pressures are possible reasons for not receiving responses from 49 percent of the counties. Recall that 29 percent of Florida is covered by wetlands—the highest percentage of land surface of all other states in the lower 48 United States.³³⁰ Of the 34 counties that responded, only four (12 percent) reported having no wetlands use regulations or protection at the county level. Wetland use regulations and protection in this survey differs from the criteria used by *St. Petersburg Times* to determine that 20 out of Florida’s 67 counties have a distinctive county program dedicated to wetlands protection. In this survey, wetland use regulations or protection within a county may include, but is not limited to, wetlands use permitting programs, county plans, and zoning and development regulations.

When asked how their county wetland protection compares to the state and federal protection, out of 30 counties reporting some form of wetlands protection at the local level, 11 (37 percent) reported having similar protection as the state and federal programs. 13 counties (43 percent) reported more protection at the county level than the state and federal levels. 12 of the 30 counties having some type of wetlands protection reported setbacks and buffer zones as a primary difference between the county and state programs. A setback or buffer zone refers to a specific distance separating construction activities from wetlands. The zones generally consist of natural or managed areas and serve as protection for wetlands from pollution or other human disturbances. Counties reported buffer zones from 25 to 75 feet from the wetland delineation line. Of the 30 counties with some sort of wetland protection, 9 counties specified that they rely on the state for permitting and enforcement of wetland use. Other reported differences include vegetation protection (not allowing mowing), protection for isolated wetlands (including

SWANCC exemptions), maximum disturbance of 5 percent, and additional “avoidance and minimization” requirements. Avoidance and minimization refers to avoiding impacts to wetlands when at all possible, and if not, then minimizing a project’s impact as much as possible through the consideration of reasonable alternatives.

Twenty-three of the thirty-four counties reported the initiation of wetlands regulations at the county level sometime between 1980 and 1996. When asked if their county plans to take over the state wetlands permitting program, an overwhelming majority of the thirty-four respondents (97 percent) reported some discussion or not at all likely to occur. Respondents reported several pros and cons of their local county wetlands protection. On the positive side, mandated buffer zones, consistency with the state process, and stricter programs than the state were common responses. Some county officials reported local problems including insufficient wetland protection, too much reliance on state and federal programs, no county permit process, the need for larger buffers, and weak compliance and enforcement. One county reported having unqualified staff and another considered their program to “not [be] very progressive.” Of the counties that had no wetlands protection rules (10 of the 34 counties), half of them reported it was not at all likely the county will create wetlands protection rules in the next two to three years. Only two counties viewed county wetlands protection rules as somewhat likely in the near future.

Obviously, many counties in Florida are involved in local wetlands protection. Many of the responses received were well-thought out and extensive. For example, one county official examined their local program stating:

The County recognizes the actual wetland as a primary zone with restrictions in accordance with state and federal law. Further, we reserve

jurisdiction to approve/deny dredge/fill activities through development order approval process. In addition to the primary zone we have a secondary protection zone or buffer of 25 feet which must be preserved and accounted for in development plans.³³¹

Some counties reporting no local program stated that the county offers recommendations to the local WMD's regarding wetland use decisions within the county. One official explains that "all wetland issues are forwarded to the FDEP or WMD's. Our land Development Code does not support the permitting of wetlands—but developers must first obtain a permit from the state prior to impacts. Conservation [or protection of] wetlands [is] required for large developments but not for a single family home owner."³³² Availability of funding, development demands within the county, and amount of land available for use may all impact a county's decision to protect wetlands beyond the state and federal programs. One thing is certain, many county officials *are* talking about wetlands and no one seems to believe their county has the ideal solution for governing wetland use.

Hillsborough County's EPC is a separate entity from Hillsborough County, and was created in 1967 by an enabling act of the Florida legislature authorizing the EPC to "adopt appropriate rules and regulations reasonably necessary to provide for the effective and continuing control and regulation of water pollution in Hillsborough County."³³³ The Hillsborough County Commissioners serve in a separate capacity as the EPC Board. The EPC acts as an environmental extension agent to the citizens in Hillsborough and has administrative and legal departments separate from the county. The EPC believes it is within the county's authority to issue and deny authorization of activities that impact wetlands and other surface waters under the EPC Wetlands Rule.³³⁴ The county created its Wetlands Management Division in 1985 and the Division has played a role in the

protection of wetlands ever since.³³⁵ In March 1987, Hillsborough residents voted nearly 3:1 in favor of a tax increase to protect environmentally sensitive lands. The money was immediately used to purchase over 10,000 acres throughout the county including wetlands within Cockroach Bay, Lithia Springs, Buckhorn Springs, and other marshes and riverbeds that offer a habitat to birds, fish and other species.³³⁶ Also in March 1987, a farmer in Hillsborough was ordered by the Division to restore 11 acres of hardwood swamps he illegally cleared with the intention of planting an orange grove. While the EPC coped with wetland issues prior to the creation of the Division, this was one of the largest illegal clearings the EPC handled in almost a decade.³³⁷ The landowner Charlie Buzbee asked the county investigator, “Are you trying to tell me what to do with my land?”³³⁸ The owner insisted the land needed to be cleared for farming. County officials expressed that they believe Buzbee’s clearing was an honest mistake due to the farmer’s advanced age.

In 1987, wetland mitigation was still a relatively new idea with some advances in technology and knowledge increasing the success rate of wetland restoration. A year after the Division was fully functioning, a staff biologist investigated mitigation sites approved by the EPC in previous years finding that 20 percent of the sites were not successful and overgrown with nuisance and invasive exotics.³³⁹ One problem developers, scientists, and environmentalists run into is reaching a consensus as to what a successful, healthy mitigation project should look like. Bob Stetler, supervisor of the dredge and fill permit section of FDEP told the *St. Petersburg Times* in 1987, “Mature cypress trees and the grasses that can grow under their canopy of shade function differently than a young stand of trees that provide no shade and share space with

different types of grasses.”³⁴⁰ An environmental lawyer shared his concern with journalist Frank DeLoache that we are “designing the wetlands around the developments rather than the development around the wetlands.”³⁴¹ That year, the EPC responded by requiring companies to monitor new marshes and grassy ponds for three years and new hardwood forests for five years. The new policy required developers to report the environmental condition of the sites to the EPC quarterly in the first year and semiannually or annually in subsequent years.³⁴²

Hillsborough County Commissioners voted three times since the Division’s creation (in 1989, 1996, and 2007) on whether or not to keep major aspects of the Wetlands Management Division. In May 1989 landowners and development lawyers spoke out about the pitfalls of the county wetland regulations.³⁴³ Opponents argued at EPC hearings in May and June that the rules defining wetlands unfairly limited the use of property, included too many types of land, and were enforced too strictly. The commission proposed changes including limiting the kinds of plants used to define wetlands, waivers for certain types of land uses such as fish farming and digging irrigation ponds, and establishing a public interest balance test for land use authorization.³⁴⁴ By a 6-1 vote, commissioners ultimately decided to leave the wetlands rules the same. Yet the commissioners urged the EPC to develop better relationships with landowners affected by wetland rules and to enforce the rules more uniformly and fairly.³⁴⁵

The 1996 debate stemmed from large landowners concerned with the significant role county environmental laws played in land use. With a struggling agricultural economy, farmers were particularly concerned.³⁴⁶ Still, the EPC citizen advisory

committee voted 12-5 to reject changes that some argue would have provided loopholes for developers by avoiding oversight in certain circumstances.³⁴⁷ The concerns expressed by landowners did encourage the EPC to consider streamlining federal, state and local wetlands regulations under one agency. In 1996, the EPC, SWFWMD, and the Corps all claimed jurisdiction over wetlands within Hillsborough County. Time wise, this is not necessarily a burden on developers because if the EPC approves a project, SWFWMD and the Corps will also approve in relatively short order. The real problem developers had was not with the number of enforcing bodies, but the stricter regulations of the EPC. Roger Stewart, executive director of the EPC in 1996, argued that developers favor SWFWMD because more often than not, the WMD allows destruction of wetlands as long as landowners promise mitigation.³⁴⁸ SWFWMD's former regulation director John Heuer disagreed, arguing that the WMD can allow greater flexibility because they examine the ecosystem of an entire region, not just a single county.³⁴⁹

In 2007, the Division did not simply face a rule change, it faced extinction, twice. The first instance occurred in March 2007 when a sentence was added to a Florida House bill by panhandle Representative Will Kendrick (R-Carrabelle) that read: "In order to avoid duplication and inefficiency, no local government shall enact or enforce a wetland regulatory program" unless a county is approved for assumption of the state program.³⁵⁰ The *St. Petersburg Times* reported that the bill "would result in a loss of legal protection for about 3-million acres of Florida wetlands."³⁵¹ The Florida Home Builders Association and the Association of Florida Community Developers lobbied for the bill arguing it would take thousands of dollars off of the cost of a new home and limit the wetland permit process to a single standard instead of three. Representative Kendrick

singled out Hillsborough County for “wasting” \$2.2 million annually on additional wetland protection, more than any other Florida county.³⁵² However, the cost to taxpayers is not as significant as Kendrick makes it out to be. Over half of the EPC’s budget comes from sources outside the county budget (e.g. fees collected, grants).³⁵³ The EPC protested that the county provides protection to wetlands less than a half acre which the state does not regulate. For example, in 2006 the Division reviewed 446 wetlands permits while SWFWMD reviewed only 166 permits within Hillsborough County.³⁵⁴ Representative Scott Randolph (D-Orlando), an opponent of the amendment, argued that local governments are best able to understand and respond to the demands of its citizens.³⁵⁵ Tampa’s Republican representative, Faye Culp voted in favor of Kendrick’s amendment, even though Hillsborough County commissioners urged Culp to vote against it.³⁵⁶ Ironically, just one month earlier, Hillsborough County considered creating *stricter* wetland regulations by increasing the 30 foot buffer zones around wetlands to 50 feet. The larger setbacks were not passed due to strong protest from developers.³⁵⁷

In April 2007, EPC commissioners voted to study the EPC and planning and growth management departments of the county to eliminate duplication of state wetlands protection within the county. After months of discussion, in June 2007 Hillsborough County commissioners voted 4-3 to disband the EPC wetland division entirely.³⁵⁸ Some of the decision was based on the state’s property tax rollback that would reduce the county’s budget by up to \$90 million.³⁵⁹ One Hillsborough resident, Manfred Liebner wrote to *The Tampa Tribune* expressing that the EPC’s vote to eliminate the Division was “the most boneheaded, shortsighted and dumbest decision this county commission has ever made.”³⁶⁰ Liebner suggests that the future of Hillsborough will be “wall-to-wall

concrete” if the Division is eliminated.³⁶¹ The County Commission scheduled a public hearing on the matter providing an opportunity for EPC executive director Richard Garrity to present a plan for streamlining the wetlands permitting process.³⁶²

While developers and other opponents of the EPC’s wetland division continue to argue the duplication of the state process, the fact is that Hillsborough County protects wetlands less than half an acre including many isolated wetlands, and only considers wetland destruction when no other reasonable use of the property is available to the landowner. The Tampa Bay Builders Association, a chapter of Florida Home Builders Association, lobbied the commissioners to eliminate the county Division. Also, a local developer Stephen Dibbs as well as a phosphate company (Mosaic Fertilizer) urged the county to save taxpayers money and eliminate the wetlands division.³⁶³ Mosaic Fertilizer owns thousands of acres in Hillsborough County and plans to mine more than 1,500 acres of its land.³⁶⁴ While SWFWMD would approve most of the project, the EPC would protect 200 acres of wetlands beyond state regulations.³⁶⁵ Florida TaxWatch contends that the county could reduce spending by \$1 million by drastically reducing its wetlands division.³⁶⁶ TaxWatch further argues that the EPC takes 144 days longer (on average) to process each permit, and its permits are 22 times more expensive than SWFWMD’s.³⁶⁷ Garrity pointed out that this 2006 data did not consider the hundreds of projects EPC staff worked on that resulted in avoiding projects near wetlands altogether, eliminating the need for permits in those cases.³⁶⁸

Local developers with small businesses have differing views of the wetlands division. William L. Dean, a Plant City small-project general contractor, wrote to *The Tampa Tribune* expressing his belief that smaller developers and contractors like him

“have come to understand and respect the importance of even the smallest of local recharge areas as they relate to the overall health of the environment and have found ways to incorporate them into the plans.”³⁶⁹ Dean felt “betrayed and angered by what appears to be a tendency by some on the commission to put the interests of a powerful, vocal and well financed few ahead of the concerns of the greater public.”³⁷⁰ However, David Campo, a local development consultant described the EPC permit process as a dreadfully painful experience: “think IRS audit, local automobile tag office, drivers license office, colostomy, root canal, and emergency room visit all rolled into one.”³⁷¹

The City of Tampa is one of many supporters of Garrity’s plan, stating that the City would propose a wetland division if the commissioners do away with the county Division.³⁷² Garrity’s hybrid plan proposed to eliminate five jobs (two of which were vacant) and speed up the review process on building projects.³⁷³ The EPC would be required to create a wetlands advisory committee made up of scientists, environmentalists, and developers.³⁷⁴ Ditches, cattle ponds and other artificial wetlands would be exempt from protection under Garrity’s plan.³⁷⁵ Under the plan, the EPC would also create a handbook to guide applicants through the permit process and requirements.³⁷⁶ The new plan is projected to save the county \$367,859 annually, and it is intended to consolidate local, state, and federal approval making the permitting process faster and more efficient.³⁷⁷

Another avid supporter of the wetlands program is Jadell Kerr, former director of the Wetlands Division of the EPC. Her support went beyond the EPC Board and Division discussions when she publicly criticized the commissioners and their decisions in an online blog site called Sticks of Fire.³⁷⁸ Kerr’s June 24th comments posted on the

blog and exposed by the press, first resulted in a two-week suspension and ended with a forced resignation. The EPC offered Kerr four months severance pay with an agreement not to sue the county, ending her 15-year career with the EPC.³⁷⁹ Richard Garrity insisted the resignation was mutual.³⁸⁰ In the blog, Kerr accuses Todd Pressman, who sits of the Governing Board of SWFWMD, of being involved in the plan to eliminate Hillsborough's wetland division. According to Kerr, Pressman also acts as a political consultant to developer Stephen Dibbs. She contends that Dibbs had a controversial development plan for a series of pipelines not likely to make it past the EPC, but would likely be approved by SWFWMD. Finally, she writes, "these arrogant commissioners have to go....they are not listening to us. The Planning Commission is next, be on the watch."³⁸¹

On July 26, 2007 Dr. Richard Garrity presented the hybrid plan to the EPC Commissioners. The *St. Petersburg Times* reported an overflowing crowd in the Board chambers speaking out in support of the wetlands division.³⁸² The *Times* painted a rousing picture of citizens storming in with t-shirts that read "WETLANDS – Save 'Em, Don't Pave 'Em," and depositing 60 cents – the program's cost per citizen into a "tip jar."³⁸³ Former EPC chief Roger Stewart was one of many outspoken wetland division supporters at the hearing. Stewart criticized the commission for only allowing each speaker one minute to address the Board. Other ex-officials, including former Commissioners Chris Hart and "Big Jim" Selvey attended the hearing in support of Garrity's plan.³⁸⁴ Garrity's presentation included information on Hillsborough's wetland types and functions, their ecological importance, and the effects wetlands have on water quality within the county.³⁸⁵ He also presented the environmental benefits from the EPC

wetlands division including wetland treatment of stormwater and natural wetland buffers, more efficient manner of meeting Total Maximum Daily Loads of nutrients and other pollutants into county waters, protection from flooding and storm surges, and protection of critical habitats.³⁸⁶ The impacts of eliminating the EPC Division include less responsive investigation and enforcement, reduced compliance, lack of local permitting process, and total reliance on less effective state programs.³⁸⁷

The Board of Commissioners voted in an August 2007 meeting to keep the wetlands division, but with cutbacks and changes to wetland protection using Garrity's hybrid plan (the plan). The commissioners attempted to appease voices from both sides. *St. Petersburg Times* columnist, Howard Troxler published a catchy carol in response to the commissioners' decision to reduce the Division entitled, "They Came Upon a Wetlands Clear":

They came upon a wetlands clear, in Hillsborough County one day,
And reg-u-la-tors of county hire for pro-tec-tion of it did pray.
"You fools!" cried angry co-mis-sion-ers, "for asphalt and condos are best!"
And so, they gutted the rules henceforth, at their monied buddies' request.³⁸⁸

In fiscal year 2007 (October 1, 2006 through September 30, 2007), the EPC wetlands division proved its worthiness. The Division completed 438 wetland delineations, reviewed 20 applications for mangrove trimming, and reviewed 1,386 projects associated with development (some impacting wetlands, some not) throughout unincorporated Hillsborough County and its municipalities. The Division received 43 applications to impact wetlands, with 22.15 acres of wetland impacts and 125.71 acres of wetland mitigation being authorized. To ensure compliance, 50 inspections were conducted, with 94 percent of mitigation sites found to be in compliance. The Division

responded to 660 citizen complaints and issued 165 warning notices for alleged violations. 81 wetland violation cases were escalated to administrative enforcement and 63 enforcement documents were executed. Furthermore, the EPC received only 47 percent of its budget from the county's general revenue fund. The remaining 53 percent came from fees collected, grants, contracts and other funds.³⁸⁹

Since the foundation of the United States and even the foundation of western civilization, farmers have used land for agriculture and carpenters have used land to build homes and businesses. Perhaps it is the natural order of things for today's landowners to argue their right to use private property for seemingly reasonable purposes like farming and building. Many consider roads, homes, stores, crops, and irrigation to be logical and practical uses of land. So, where do we draw the line with land use, specifically wetland use? Hillsborough County uses public interest and reasonable use tests to determine wetland use. Because wetlands offer public benefits like water quality, flood control, and aesthetic appeal, a landowner must first prove that the proposed activity does not negatively impact the public interest. Then, they must prove that no other reasonable use of their land exists for before a permit to impact wetlands is approved. If a permit is approved, the county determines mitigation requirements needed to offset the proposed impacts.

The Division remains responsible for delineation of wetlands within the county. This may include delineations requested by the county or a landowner. Jurisdictional delineation is determined through a field assessment of the property in question by an EPC environmental scientist.³⁹⁰ If an applicant applies for a permit for construction in a wetland area, adequate protection of environmental benefits must be enforced by the

Division (e.g. permit denial, suggesting reasonable alternatives, or mandating mitigation).³⁹¹ The county defines “reasonable use of the land” as an actual, present use or activity on a parcel of land which is suitable for the parcel of property and compatible with adjacent land uses.³⁹² The rules specify that reasonable use *does not* mean the highest and best use of property. This is an important distinction because a property use may be identified as a reasonable use without being the highest and best use of the property. The highest and best use of property is a method used in real estate appraisal that identifies which use of a property would produce the greatest net return in a given period of time.³⁹³ The highest and best use must comply with all laws and regulations including county codes and ordinances.³⁹⁴ The Division considers eleven factors when determining if a proposed property use is reasonable:

1. current zoning of the property
2. whether the land would lose all economic value upon denial of the wetland impact
3. existing use of the property
4. a survey showing the parcel’s wetlands, setbacks, and buildable areas
5. any reasonable alternatives when the proposed activity is for access roads
6. documented efforts by the applicant to avoid impacting wetlands
7. wetland or other surface water regulations in effect at the time the owner acquired the property
8. whether the purpose of the proposed activity is solely for an environmental restoration project or other environmentally beneficial project
9. efforts of the landowner to obtain waivers or variances from other development restrictions that would result in wetland or surface water impacts

10. whether the impact is necessary for public health and safety

11. any other circumstances or information important to the development of the property (e.g. unusual topography or unique engineering requirements).³⁹⁵

It is the applicant's burden to prove that they cannot get any other reasonable use out of the property. The Division's Mike Thompson admits this is a high bar for applicants.³⁹⁶

The decision to approve a wetland impact permit and the methods for mitigation are two separate processes within the Division. Mitigation is not used as a justification for approval of a wetland impact permit.³⁹⁷

Once the Division determines that an activity represents reasonable use of the land, the Division then decides how to maintain the environmental benefits provided by the wetland. The applicant must address the adverse impacts through mitigation whether the proposed impacts are temporary or permanent.³⁹⁸ However, temporary or nominal impacts do not require the same level of mitigation as permanent impacts. The Division conducts engineering reviews before and after the project takes place. Reviews help to protect wetland and aquifer hydrology and to ensure water quality is maintained throughout the project.³⁹⁹ The EPC timeframe requires that wetlands staff will issue comments through either an approval letter or request for additional information within 30 days of receiving a complete application for wetland impact and mitigation proposals.⁴⁰⁰

The Division applies the Uniform Mitigation Assessment Method (UMAM) to assess the type of impact and proposed mitigation, "including the preservation, enhancement, restoration, and creation of wetlands" and an evaluation of the use of mitigation banks.⁴⁰¹ The UMAM determines the functional loss of impacted wetlands

and the functional gain of mitigated wetlands. The Florida Legislature directed the FDEP and the four WMDs responsible for the state ERP program to develop a UMAM for wetlands and other surface waters to ensure state-wide mitigation consistency. The method went into effect February 2, 2004 and is the sole method of mitigation assessment used by state entities.⁴⁰² Appendix D displays the forms used by governments throughout the state including the Hillsborough EPC to determine the UMAM for wetland impacts. Hillsborough County considers quality and quantity of the impacted and mitigated wetlands using a numerical scale that ranks various categories of wetland characteristics.⁴⁰³ When mitigation is required, the county requires at least an acre for acre replacement of the same or better quality wetland providing the same environmental benefits lost in the impacted wetland.⁴⁰⁴ Furthermore, the entire mitigation project must be within Hillsborough County.⁴⁰⁵

There are several mitigation exemptions in the county program. The applicant is exempt from mitigation requirements if the proposed activity will permanently impact 500 square feet or less of an artificially created ditch to develop a crossing (for a maximum of two crossings at least 500 feet apart).⁴⁰⁶ This exemption does not apply if the impacted ditches “divert historical perennial or intermittent streams or creeks.”⁴⁰⁷ Wetland impacts of one quarter acre or less in size are also exempt from mitigation requirements if the total impacted area on the property is less than one half acre (and does not impact endangered or threatened species) and the property is used for agricultural purposes for at least five years from the date of impact.⁴⁰⁸ If the property is converted to other uses within five years by the same landowner or a new landowner, the impacted wetlands must be fully restored or the functional loss must be mitigated.⁴⁰⁹ Opponents to

this exemption argue that developers can lease a property for agricultural uses for five years, destroy wetlands on the land during that time, and develop when the five years are up.⁴¹⁰

I examined wetland impact permit applications that were approved by the Division in 2007 and 2008 after the hybrid plan was approved, but before the single-family permits were streamlined with the state and federal process.⁴¹¹ My data collected from the case files is located in Appendix E. It could have been beneficial to also examine denied permit applications; however the cases I reviewed were pre-selected by the Division staff intended to represent typical permits resulting in mitigation. They do not offer a representative sample of all permit applications. In all of the nine cases I reviewed, the mitigation requirements resulted in a higher quantity of wetlands and an increase in ecological function, or functional lift. The Division calculates the functional lift by adding together the functional loss of impacted wetlands (a negative number) and functional gain of mitigated wetlands (a positive number). Six of the nine files resulted in permits allowing impacts to low quality wetlands (e.g. dominated by invasive or nuisance species, poor water quality, previously built ditch) and mandated higher quality wetland mitigation (e.g. improved water quality, desirable wetland vegetation, habitat to an increased number of wildlife species). In three of the nine cases, endangered or threatened species were found within the impacted wetlands.⁴¹² The permits were approved because nearby wetlands offered a habitat for the threatened and endangered species affected, the wetland impacts were only temporary, or the mitigated wetlands would provide a habitat within close proximity of the impacted wetland. The cases

appeared to be thoroughly examined by Division staff including field examinations, series of scaled maps, and consistent dialogue between the staff and the applicant.

The current wetlands plan offers a number of benefits to taxpayers compared to the state and federal programs. The manager of the Permitting Section of the Division, Mike Thompson shared a number of these benefits in an interview in October 2008. The Division has a strong compliance and enforcement department compared to that of SWFWMD or the Corps. As of August 2007, *The Tampa Tribune* reported that SWFWMD had only one designated compliance officer.⁴¹³ Since 2005, the EPC has agreed in a Memorandum of Understanding (MOU) with SWFWMD to do the compliance on state permits.⁴¹⁴ Since Hillsborough County's wetland permit requirements are more strict than the state's, the county would already be enforcing compliance for the projects receiving state-issued permits. While customer service improvements and regulation changes are some of the improvements Thompson noted, he argues that the unfortunate budget and staff cuts came at what was perhaps an ideal time. With an economic slowdown, the Division began to receive fewer permit applications and is continuously finding ways to become more efficient.⁴¹⁵ However, the compliance section has not seen a decrease in activity, as much of the big development activity of the past decade (especially 2002-2006) is still being mitigated.⁴¹⁶

The Division has a relationship with SWFWMD, the Corps, Tampa Port Authority, and phosphate operations. The Division is responsible for commenting on applications for development activities affecting wetlands submitted to other agencies such as Hillsborough County (planning, zoning, etc.) the Tampa Port Authority, and municipalities. This may include applications submitted to the county's planning

department for projects impacting buffer zones set by the county's planning department, but areas not delineated as wetlands. It may also include applications submitted to another county department in which wetlands are indirectly impacted or the impacts fall within permit exemptions with the Division. Further, the Division submits comments to the Tampa Port Authority. In November 2007, the EPC agreed to delegate minor works activities such as docks, rip rap, and maintenance dredging to the Tampa Port Authority.⁴¹⁷ EPC is working with SWFWMD to ensure consistency in delineation and UMAM processes through their MOU.

Garrity's hybrid plan directed the EPC to investigate assumption of a portion of the state permitting program. In January 2008, the EPC applied to the FDEP for partial delegation of the Environmental Resource Permit program (ERP program). This would also include delegation of Programmatic General Permit authority from the Corps for single-family property reviews that impact wetlands. Single-family permit applications refer to any project impacting wetlands on a single-family property such as construction of a private dock and minor fill activities for reasonable use of the property. The application is currently in the process of receiving state comments and county responses. The implementation of the state's ERP program by Hillsborough County is estimated to start early 2009.⁴¹⁸ The county is not taking over the entire state ERP program at this time because single-family applicants account for approximately 10 percent or less of the total permit reviews within the county.⁴¹⁹ The assumption will save time and will not cost the county taxpayers any extra money. The EPC and SWFWMD are simply combining the two permit programs making it a more efficient one-stop permit process for single-family applicants.

The citizens of Hillsborough County are very much interested in the role the EPC plays in defining wetlands and wetland use. Each citizen brings a different perspective to the table from environmental activists of the local Sierra Club to environmental lawyers who represent big name developers. At the same time, farmers perhaps have a unique relationship with wetlands. The purpose of their professional life is to produce food and other crops for human consumption. Farmers feed people, provide cotton for clothes, and raise cows that produce milk. Wetlands are a nuisance to farmers. Wildlife eats their crops and the low-lying land floods during the growing season. Phosphate miners are controversial players in the wetlands discussion in Hillsborough County. Aside from impacting the quantity and quality of wetlands through new mining projects, reclamation of previously mined areas for wetlands restoration is risky. The Florida Institute of Phosphate Research, an independent state research agency, reports that soil radium, phosphor-gypsum, and radon (a known cause of lung cancer) are by-products of phosphate mining and the fertilizer process, so public health must be considered when reclaiming old phosphate mines.⁴²⁰ If wetlands are restored on old phosphate mines, the wetlands may become a part of the local watershed impacting public and environmental health with phosphor-gypsum, radium, and phosphorous seepage into the ground and flood waters.⁴²¹

Through the years, developers have demonstrated that they have no use for the EPC's wetlands management division, seeking loopholes, fighting the division in its entirety, and lobbying local and state legislators to eliminate the Division. Can we blame them? Their professional goals are to make money building homes and businesses for residents, and wetlands protection costs them money. With more than 29 percent of the

state consisting of wetlands, developers have a tough time finding land that is free of any and all wetland impacts.⁴²² Environmentalists also speak out toward the Division—but for more landscape protection, not less. Hillsborough County’s EPC and the Board of Commissioners act to appease the many voices demanding very different actions. We should ask ourselves if the EPC has met our expectations for wetlands protection or if there is a better and more practical approach. Perhaps there is, but Hillsborough County currently offers the state and nation a working example of a reasonably well-thought out local wetlands program.

Chapter 8

Conclusion

Over the course of American history, our culture has developed a better understanding of the functions and values of wetland ecosystems. This understanding led to greater demands for government intervention in the use of wetlands. Most Americans agree that wetlands need some level of protection because they enhance water quality, wildlife support and flood control. Advances in scientific research and geographical studies have impacted our perspectives of these unique ecosystems. The more we learn as a culture, the more our demands shift. Food, water, and oxygen are irreplaceable necessities of life that no level of technology can replace. Simply put, human survival is dependent on nature, including wetlands. While our capitalistic culture promotes growth, development and the mass production of consumer items, our innate needs for clean water, food and air balance consumer demands.

Our relationship to nature impacts how we address environmental problems. The wetlands conversation within a locality is driven by the connection residents have with these ecosystems. Humans have a tendency to connect with surrounding natural areas through topophilia, one's bond to their direct environment and biophilia, humanity's innate love for living things. Our perception of wetlands influences our views on wetland policy. Some perspectives lean toward personal freedoms while others favor sustainable stewardship. Wetlands are generally harder natural areas to protect. They are often

viewed as swampy grasslands or mosquito-ridden bogs with little aesthetic appeal. Florida's wetlands are especially flat and heavily vegetated, and may even lose aesthetic battles juxtaposed against a nicely designed office building and subdivision. Yet, state governments develop wetland regulation and protection in response to inadequacies of the federal government's Section 404 program and demands of concerned citizens. Several county and municipal governments have responded to residents asking for wetland policies that best meet the unique needs of their locality; requests the state cannot always meet.

Government actions are deeply rooted in public opinions. The county government is generally the first place a community turns to with local concerns or complaints. While some counties in Florida do not provide any wetland regulation and protection, many have some type of wetland rules and several have wetland protection divisions. Some counties offer their residents little more than the opportunity to comment on state permit applications. Other counties include wetlands rules and enforcement within their master plans. An increasing number of counties are considering or already use a wetlands permit program separate from the state program.

Hillsborough County's Wetland Division seems to be moving toward an efficient program that offers a clear-cut permit process to applicants. Hillsborough EPC's hybrid plan demonstrates an efficient wetland impact permit process. While they are perhaps the most vocal opponents to county wetlands protection, farmers, developers and phosphate companies are not the only ones seeking permits from the county. Residents may find themselves applying for a permit to fill a wetland as small as a tenth of an acre to achieve desired use of their property. Furthermore, single-family residents may find out that their

application to fill that seemingly useless muck-filled hole is denied. If the program in Hillsborough County was not in place, filling a wetland that size would not need state approval. To the state, any wetland under a half acre is not worth the time and resources necessary to protect it.

One could argue that an ideal county wetland program would meet the local residents' expectations and fulfill all state and federal requirements, creating a completely consolidated permit process. This would appease applicants, particularly farming and development communities and it has the potential to meet the environmental demands sought out by environmentalists and residents who are looking to enjoy Florida as it is: a series of swamps, lakes, rivers, and beaches. A fully consolidated program may be possible if the Army Corps and Florida DEP provided funding equivalent to that otherwise used to review applications and enforce permit compliance within the county seeking state and federal wetlands permit program assumption.

With more time and financial resources, one could dig deeper in the local wetlands discussion. I would like to interview more people involved with the Corps, FDEP, and Hillsborough EPC to study the perspectives of various staff members. Interviewing local environmental organizations and residents including farmers and developers would be very time-consuming, but could tell us more about local opinions and the role individuals and organizations play in County decisions. A juxtaposition of the history of Hillsborough County's and Broward County's wetland program and permit process would offer insight on the effectiveness of consolidated wetland permit programs. Such research may also lead to studying the success of wetlands mitigation projects approved by Hillsborough County within the last decade. The success of

wetlands mitigation projects approved by Hillsborough County could also be compared to those approved by either the State or the Corps.

Endnotes

¹ Thomas E. Dahl, *Wetlands Losses in the United States 1780's to 1980's*. (Washington, D.C.: U.S. Department of the Interior, Fish and Wildlife Service, 1990), 1. Thomas Dahl reports in: *Status and Trends of Wetlands in the Conterminous United States 1986 to 1997*. (Washington, D.C.: U.S. Department of Interior, Fish and Wildlife Service, 2000) that 105.5 million acres of the original 221 million acres of wetlands remain in the conterminous United States. This figure represents a 52.27% loss from 1780 to 1997. Thomas Dahl reports in: *Status and Trends of Wetlands in the Conterminous United States 1998 to 2004*. (Washington, D.C.: U.S. Department of Interior, Fish and Wildlife Service, 2006) that there was a net gain of 191,750 acres of wetlands between 1998 and 2004, but that this number did not take into account the quality of these wetlands.

² Dahl, *Wetlands Losses*, 4.

³ *Ibid.*, 10.

⁴ According to the Association of State Wetlands Managers, programs include wetland regulation and mitigation, wetland water quality standards, monitoring and assessment, voluntary restoration, tax incentives, coordination and public/private partnerships. <<http://aswm.org/swp/statemainpage9.htm>>, updated April 4, 2005.

⁵ Michael Grunwald, *The Swamp: The Everglades, Florida, and the Politics of Paradise*. (New York: Simon & Schuster, 2006), 81-89.

⁶ Rebecca Catalanello and Craig Pittman, "18 words imperil 3-million acres," in *St Petersburg Times*, March 31, 2007, 1B.

⁷ 117 million acres converted of the estimated 221 million acres in 1780s, Dahl, *Wetlands Losses*, 5.

⁸ National Research Council, *Wetlands: Characteristics and Boundaries* (Washington, D.C.: National Academy Press, 1995), 1.

⁹ Hugh Prince, *Wetlands of the American Midwest: A Historical Geography of Changing Attitudes* (Chicago: The University of Chicago Press 1997), 14.

¹⁰ Environmental Protection Agency, “Recognizing Wetlands: An Informational Pamphlet,” <<http://www.usace.army.mil/cw/cecwo/reg/rw-bro.htm>>.

¹¹ Ralph W. Tiner, *Wetland Indicators: A Guide to Wetland Identification, Delineation, Classification, and Mapping* (Boca Raton: Lewis Publishers, 1999) 127.

¹² *Ibid.*, 18.

¹³ *Ibid.*, 21.

¹⁴ *Ibid.*, 23.

¹⁵ *Ibid.*, 66.

¹⁶ *Ibid.*, 66.

¹⁷ *Ibid.*, 19.

¹⁸ *Ibid.*, 77.

¹⁹ *Ibid.*, 128

²⁰ *Ibid.*, 81.

²¹ Ralph W. Tiner, “Technical Aspects of Wetlands: Wetland Definitions and Classifications in the United States,” in *National Water Summary on Wetland Resources, USGS Water Supply Paper 2425*, (Washington, D.C.: United States Geological Survey, 1996) <<http://water.usgs.gov/nwsum/WSP2425/definitions.html>>.

²² Tiner, *Wetland Indicators*, 267; Lewis M. Cowardin, et al. *Classification of Wetlands and Deepwater Habitats of the United States* (Washington, D.C.: U.S. Department of the Interior, Fish and Wildlife Service, 1979).

²³ National Research Council, *Wetlands: Characteristics and Boundaries*, 3.

²⁴ Tiner, *Wetland Indicators*, 21.

²⁵ *Ibid.*, 21.

²⁶ US Army Corps of Engineers, “Wetlands Delineation Manual Part II: Technical Guidelines” (26)(b)(3), and “Part III: Characteristics and Indicators of Hydrophytic Vegetation, Hydric Soils, and Wetland Hydrology” (49)(b)(2).

²⁷ Cowardin, *Classification*, 3.

²⁸ U.S. Department of Agriculture, *National Food Security Act Manual*, 4th ed., Title 180, 514.2(G) (Washington, D.C.: United States Department of Agriculture, 2003).

²⁹ William J. Mitsch and James G. Gosselink, *Wetlands*, 3d ed. (New York: John Wiley & Sons, Inc., 2000), 571.

³⁰ National Research Council, *Wetlands: Characteristics and Boundaries*, 34.

³¹ *Ibid.*, 35.

³² Ann Vileisis, *Discovering the Unknown Landscape: A History of America’s Wetlands*. (Washington, D.C.: Island Press, 1997), 163.

³³ National Research Council, *Wetlands, Characteristics, and Boundaries*, 42.

³⁴ These works of literature and prominent views will be addressed in Chapter Four of this thesis including Washington Irving’s “The Legend of Sleepy Hollow” and the Old English story of *Beowulf*.

³⁵ Max Oelschlaeger, *The Idea of Wilderness* (New Haven: Yale University Press, 1991),

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³⁶ Gordon Graham Whitney, *From Coastal Wilderness to Fruited Plain: A History of Environmental Change in Temperate North America, 1500 to the Present* (New York: Cambridge University Press, 1994), 2.

³⁷ Wilson, Edward O., *Consilience: The Unity of Knowledge*. (New York: Alfred A. Knopf, 1998), 325.

³⁸ Wilson, *Consilience*, 128-29.

³⁹ Kay Milton, *Loving Nature: Toward an Ecology of Emotion*. (New York: Routledge, 2002).

⁴⁰ *Ibid.*, 150.

⁴¹ Oelschlaeger, *Idea of Wilderness*, 5-9.

⁴² Paul Shepard, *Coming Home to the Pleistocene*, ed. Florence R. Shepard (Washington, D.C.: Island Press, 1998), 7-8: Paleolithic people believed in a continuum of all things living and non-living; not a separation of human and nature; and no separation of good and evil, or subject and object.

⁴³ *Ibid.*, 43-47.

⁴⁴ Oelschlaeger, *Idea of Wilderness*, 31-41.

⁴⁵ *Ibid.*, 31-41.

⁴⁶ *Ibid.*, 41-67.

⁴⁷ *Ibid.*, 51-52.

⁴⁸ *Ibid.*, 32-37.

⁴⁹ Carolyn Merchant, *Reinventing Eden: The Fate of Nature in Western Culture* (New York: Routledge, 2004), 12.

⁵⁰ *Ibid.*, 14.

⁵¹ *Ibid.*, 17.

⁵² *Ibid.*, 18.

⁵³ *Ibid.*, 20-21.

⁵⁴ *Ibid.*, 26.

⁵⁵ *Ibid.*, 11-38.

⁵⁶ Oelschlaeger, *Idea of Wilderness*, 76-90.

⁵⁷ *Ibid.*, 76-90.

⁵⁸ Peter Fritzell. "American Wetlands as Cultural Symbol: Places of Wetlands in American Culture," in P.E. Greeson, J.R. Clark, and J.E. Clark [eds.], *Wetland Functions and Values: The State of Our Understanding* (Minneapolis: American Water Resources Association, 1979), 529.

⁵⁹ William Cronon, "The Trouble with Wilderness; or Getting Back to the Wrong Nature," in *Uncommon Ground: Rethinking the Human Place in Nature*, ed. William Cronon (New York: W.W. Norton & Company, 1996), 69-90.

⁶⁰ Fritzell, *American Wetlands*, 530.

⁶¹ *Ibid.*, 530.

⁶² Frederick Jackson Turner, *The Frontier in American History* (New York: Henry Holt and Company, 1920).

⁶³ William Cronon, "The Trouble with Wilderness...", 69-90. The concepts of sublime and frontier are elaborated in this text.

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- ⁶⁴ Lynn White, "The Historical Roots of Our Ecological Crisis," in *Environmental Ethics: What Really Matters, What Really Works*, ed. David Schmidtz and Elizabeth Willott (New York: Oxford University Press, 2002), 7-14.
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- ⁶⁶ *Ibid.*, 69-90.
- ⁶⁷ Yi-Fu Tuan, *Topophilia: A Study of Environmental Perception, Attitudes, and Values* (Englewood Cliffs: Prentice-Hall, Inc., 1974), 4.
- ⁶⁸ Erich Fromm, *The Heart of Man: Its Genius for Good and Evil* (New York: Harper & Row, 1964), 52.
- ⁶⁹ Edward O. Wilson, *Biophilia* (Cambridge: Harvard University Press, 1984), 22.
- ⁷⁰ Tuan, *Topophilia*, 4.
- ⁷¹ *Ibid.*, 59.
- ⁷² *Ibid.*, 246-7.
- ⁷³ *Ibid.*, 12.
- ⁷⁴ Fromm, *The Heart of Man*, 113-4.
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2. program must apply to ‘waters of the U.S.’ Sec 404 (g)(1)
3. program must be an individual and general permit program; Sec 404 (g)(1)
4. State must have authority to issue permits; Sec 403, Sec 404 (h)(1)
5. permits must apply for a fixed term not exceeding 5 years; Sec 404 (h)(1)(A)(ii)
6. permits must be able to be terminated for cause, Sec 404 (h)(1)
7. State must apply and assure compliance with the monitoring and enforcement requirements of Section 308 of the Act, or “inspect, monitor, enter and require reports to at least the same extent as required in Section 308...” Sec 404 (h)(1)(B)
8. State must assure that the public, and other States with waters which may be affected by such a permit receive notice of each permit application and be provided with “an opportunity for public hearing” before the permitting State rules on the application. Sec 404 (g)

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9. State must assure that the Administrator of E.P.A. receives notice of each general permit and individual permit application; Sec 404 (j)
 10. State must be able to deny a permit if E.P.A. objects to the permit, or if the Secretary of the Army determines that “anchorage and navigation of any of the navigable water could be substantially impaired thereby.” Sec 404 (h)(1)(F)
 11. State must be able to “abate violations of permits or the permit program; Sec 404 (h)(1)(G)
 12. State must assure that the program and permits are coordinated with other “Federal and Federal-State water-related planning and review processes.” Sec 404 (h)(1)(H).

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³⁶⁹ William L. Dean, “A Builder Defends Wetlands,” in *The Tampa Tribune*, July 26, 2007, 13.

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⁴⁰⁰ Environmental Protection Commission of Hillsborough County (EPC), *EPC Permitting Guide*, October, 2008, 34 <<http://www.epchc.org/>>.

⁴⁰¹ *Ibid.*, 7.

⁴⁰² FDEP, “Uniform Mitigation Assessment Methodology,” Florida Statute 373.414(18)

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⁴⁰⁴ EPC, *Rules of the Environmental Protection Commission of Hillsborough County: Chapter 1-11, Wetlands*, October 20, 2008, 4 <<http://www.epchc.org/rules.htm>>.

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⁴¹⁰ Bill Coats, “Limited Filling of Wetlands Okayed,” in *St. Petersburg Times*, January 18, 2008, 3B.

⁴¹¹ Tampa Bay Regional Water Treatment Plant, January 2008; Roadway Yellow Express Tampa Terminal Expansion, July 2007; Van Dyke Road Widening Project, May 2008; Hidden Creek East, March 2007; Whispering Woods Subdivision, August 2008; Forest Glen Subdivision, February 2008; Palza 301, October 2007; Ravinia, October 2007; Emerald Bay Professional Park, November 2007; see Appendix E.

⁴¹² Species include: snowy egret, little blue heron, tri-colored heron, white ibis, and eastern indigo snake; see Appendix E.

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⁴²⁰ Florida Institute of Phosphate Research, “Public and Environmental Health,”

<<http://www.fipr.state.fl.us/research-area-public-health.htm>>.

⁴²¹ Greg Martin and Steve Reilly, “Phosphate Risks Abound,” in *Florida: The State of Phosphate*, <<http://www.sun-herald.com/phosphate/>> last accessed November 19, 2008.

⁴²² Dahl, *Florida’s Wetlands: Status and Trends*, 8.

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Appendices

Appendix A

Cover Letter for County Survey

The following cover letter was sent with the survey displayed in Appendix B to county officials in the 67 counties of Florida.

September 18, 2008

Dear County Official:

I am a graduate student in the College of Arts and Sciences, Florida Studies Program at the University of South Florida, St Petersburg. I am conducting a brief survey of county wetlands regulations and protection in Florida. The survey is a part of a research project focused on local wetland protection and data collected in this survey may be used in my master's thesis. The results from this statewide survey may also be published in an academic journal article. Your responses will remain anonymous and they will help to shed light on wetlands protection in the state of Florida. However, your participation in this survey is completely voluntary.

I hope you will participate, so I have provided a stamped and addressed envelope for you to return your responses by regular mail at your convenience. If you have any questions about this project, feel free to contact Allyson R. Bennett at:

arbennet@mail.usf.edu

Thank you for your time.

Sincerely,

Allyson R. Bennett
Florida Studies Program
USF St Petersburg

Appendix B

County Survey

The following survey was sent to county officials in the 67 counties of Florida.

1. Does your county government provide any protection or regulate in any way the use of wetlands?

if yes, please continue to question 2; if no, please move on to question 7

2. How would you rank your county's wetland use regulations compared to the wetland regulations of the state and federal government? Compared to the state and/or federal government's regulations, my county's wetland use permitting regulations provide:

Less protection for wetlands		Similar protection for wetlands		More protection for wetlands
1	2	3	4	5

Please describe any specific ways that your county regulations differ from the regulations set by the state and federal government.

3. What year did your county first pass wetland use regulations?

Appendix B (continued)

4. The Hillsborough County Commission has voted to greatly reduce their county wetlands regulation division, and at the same time, they have applied to have the state delegate its wetland permitting authority to Hillsborough County. Is your county considering applying to take over the state's responsibility for wetland use permitting?

Not at all	Some Discussion	Possibly	Likely	Near Certainty
1	2	3	4	5

5. In the last 5 years, what would you say is the average number of wetland use permit applications your county processes each year?

Please circle one:

Less than 50	50 – 150	150 – 250	more than 250
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6. In a brief self-assessment, please list what you think are the pros and cons of your county's wetland regulations/protection.

PROS	CONS

Appendix B (continued)

7. *If you answered “no” to question 1:*

How likely do you think it is that your county will create wetlands protection rules in the next 2-3 years?

Not at all likely

Somewhat likely

Very likely

1

2

3

4

5

Appendix C

County Survey Responses

The following tables represent the responses to the survey displayed in Appendix B provided by 34 counties in Florida.

Question 1:

Response	Number of Counties
Yes	30
No	4

Question 2:

Response	Number of Counties
1 – Less protection for wetlands	4
2	1
3 – Similar protection for wetlands	11
4	7
5 – More protection for wetlands	6

Question 2 Response	Question 2 explanations
4	Have established a specific number of feet (30 feet buffer); DEP doesn't have any buffer, nor do they protect shorelines or wetland vegetation. You can mow the plant down to the ground level, as long as the roots aren't disturbed.
1	The County regulations defer to state regulations. We do not permit wetlands. If the FDEP permits dredge and fills we do not object.
4	Require buffers surrounding wetlands

Appendix C (continued)

Question 2 Response	Question 2 explanations continued
3	
4	The County recognizes the actual wetland as a primary zone w/ restrictions in accordance w/ state and federal law. Further, we reserve jurisdiction to approve/deny dredge/fill activities through development order approval process. In addition to the primary zone we have a secondary protection zone or buffer of 25 feet which must be preserved and accounted for in development plans.
3	Minimum setbacks are measured from landward edge of upland buffer.
4	Protects isolated wetlands; requires wetland buffers for isolated & contiguous wetlands; requires building setbacks from wetlands; buffers are to remain natural; wetlands shall not be moved
3	The County has created a tiered approach to wetlands – high quality and low quality. High quality can not be altered; low quality can with permits from state
3	We primarily rely on SWFWMD regulations for the protection of wetlands.
5	2 degree impacts; buffers at 30 feet; protection of isolated wetlands; protection of environmental sensitive lands (ESA); MERS: Marine, Estuarine, Riverine Setbacks
3	
N/A	
3	County provides similar protection to wetlands in those rare instances where an activity proposed in a wetland is not regulated by a state agency.
5	We have same delineation & mitigation methodology. However, we have more restrictive code regarding the ability to impact wetlands
N/A	We do not have wetlands use permits; no activity allowed in wetlands; setbacks required; exception state permitted mining
5	All wetlands protected with a no-net loss concept. No UMAM. Max disturbance is 5% if there is no other reasonable alternative
3	We have additional septic tank setback requirement along the river
2	We rely on state and federal rules and do impose additional restrictions
5	county-wide minimum standards, implementing ordinance for unincorporated areas & cities without their own ordinances, regulate or require mitigation for docks, seawalls, ramps, buffers, exempt wetlands <1/2 but otherwise regulate isolated wetlands and surface waters; also address vegetation removal where other agencies do not; tend to require additional avoidance & minimization than other agencies.

Appendix C (continued)

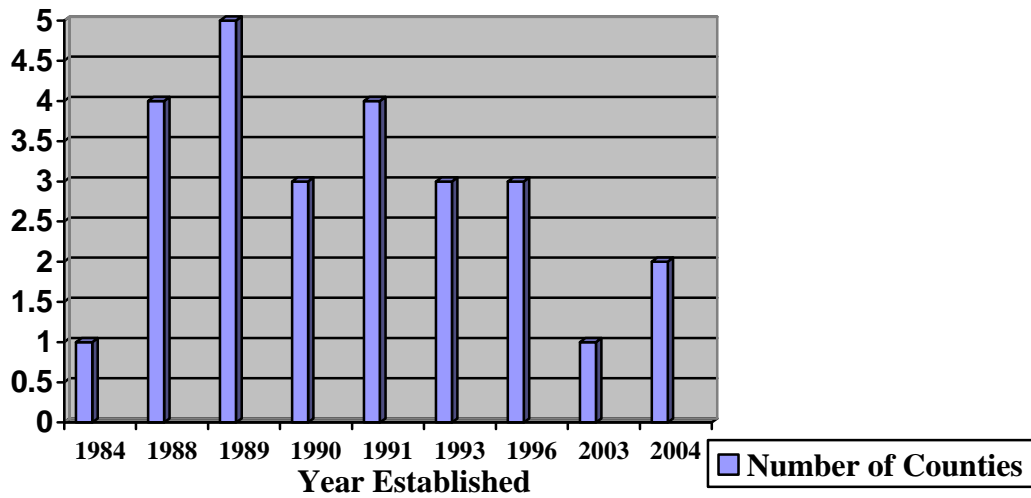
Question 2 Response	Question 2 explanations continued
1	We provide protection by enforcing state and federal regulations. If impacts are proposed, the permit applied for at the county will remain rejected pending approved state/federal permits be provided to staff.
1	County does not have regulations, but we have the County Comprehensive Plan which sets the County's standards.
3	Pursuant to County regulations, we do not duplicate jurisdictional entities as to protection or permitting
3	
4	County protects by requiring a min. 40 foot buffer (state req. 25 foot); County Board of CC can require additional mitigation acreage
3	N/A
N/A	
3	We rely on state & federal agencies to permit & require mitigation for impacts. We protect wetlands through a county code, open space preservation requirement, and Comprehensive Plan Policy
4	Co. requires a professional environmental evaluation on all parcels which may contain wetlands before a clearing and/or building permit is issued. Also, Co. protects cutthroat seep areas which is not an ecological system typically delineated by state or federal standards.
N/A	
5	Our program has more stringent wetland impact reduction criteria, no exemptions, and no threshold for wetland impacts requiring mitigation.
4	County requires wetland buffers from all wetlands. In no case is the buffer less than 30 feet. While more recent state legislation preempted the County for mitigation standards, the County requires mitigation in cases where the state does not. The County employs “avoidance and minimization” criteria along with land use approvals.
1	All wetland issues are forwarded to the FDEP or WMD’s. Our land Development Code does not support the permitting of wetlands – but developers must first obtain a permit from the state prior to impacts. Conservation over wetlands are required for large developments but not for a single family home owner
5	Any impact, regardless of average size is regulated

Appendix C (continued)

Question 3:

Year/response	Number of Counties
1984	1
1988	4
1989	5
1990	3
1991	4
1993	3
1996	3
2003	1
2004	2
Opted out of wetland permitting in 1996	1
Unknown	2

Date of First County Wetland Use Regulations



Question 4:

Response	Number of Counties
1 – Not at all	22
2 – Some Discussion	6
3 – Possibly	0
4 – Likely	1
5 – Near Certainty	0
“Delegation was received from FDEP & SFWMD on July 19,2001. ACOE delegation is being discussed.”	1

Appendix C (continued)

Question 5:

Response	Number of Counties
Less than 50 or no county jurisdiction	15
50-150	5
150-250	2
More than 250	1
No Answer	6

Question 6:

PROS	CONS
At least we have one (30 foot buffer)	Buffer too small, need at least 75 foot buffer
If the state agency approves, we approve	Sometimes the state agency approves things that should not be approved
Protect wetlands from development	None
Allows for assessment of proposed developments impact on specific sites	Not strict enough
Dredge and fill with state and federal permits must still be approved by County 25 foot buffer adds protection	Not well understood by all Not popular with developers
Establishes standards for upland buffers	Does not recognize UMAM (F.S. 373) or how to evaluate functional value
Requires buffers Requires setbacks Wetlands to remain natural Many to be placed in CE before permit approval even without wetland impacts	Relies too heavily on DEP/SJRWMD Need more protection for isolated wetlands Buffers do not need to be included in CE
Allows some use of altered wetlands Provides greater protection for high quality wetlands	Puts county into same wetland interpretation with no qualified staff
Do not duplicate state regulations	Not very progressive
2 degree impacts avoided 30 foot buffers (no averaging) protection of lands exempted by SWANCC decision	
N/A	
N/A	

Appendix C (continued)

PROS	CONS
County's wetland protection regulations are invoked so infrequently that they provide no significant change to the overall wetland landscape in the County	
Greater wetland protection overall	Doesn't consider wetland quality
Do not allow disturbance of wetlands at all except mining	We do not have penalties Do not have environmental review board
Best protection Easy to enforce No UMAM – uncomplicated permitting	Limits development
No duplication of permitting Less confusion in permitting process Better working relationship with consumers Easier to substantiate the requirements due to accountability of state data	May not be as restrictive as some want Minor wetlands below state thresholds may be damaged
No local oversight Complete delegation	No local oversight No accountability
Regulate dredge, fill, construction, mowing, & other vegetation removal Require buffers (minimum 25 or 50 feet depending on area) Require mitigation for almost all impacts to wetlands, buffers, & surface waters Have more effective enforcement provisions than state and federal	Open exemption for bona fide agricultural use (sometimes exploited) Buffers not big enough Not specific enough about what is sufficient avoidance and minimization No provision for criminal enforcement
Less processing time – all work is through state/federal agencies Truthfully, not many...	Waiting time for county permit approval is very long Staff has no say in what should be allowed and what should not State/federal agencies are severely over-extended, therefore there is still a lack of wetland protection Staff has no jurisdiction to levy fines for wetland violations (and there are a lot of violations for people who either don't know better or just don't think they will get caught

Appendix C (continued)

PROS	CONS
Set comprehensive plan language Allows us to write comments on developments Set comp plan language allows for regulations to be written in the future	No local regulations Developers do not necessarily need to adhere to County level seems like never any time to start writing the regulations
No duplication of review or permits	Timeliness of permits thru state and fed offices
We have not done any development in wetlands areas	
More stringent than state	Unqualified County personnel re: wetland science in Planning Dept.
In the event of a wetland violation, Board of CC has power to order wetland restoration or creation by agent responsible for violation Density credit transfer from wetlands to uplands allowed on project sites Opportunity to enforce sequence of “avoidance, minimization & mitigation” in reviewing new development projects	No specific prohibition of out-of-county mitigation in wetland ordinance
N/A	
Wetland can be protected through county preserve requirement Wetlands can be protected by Lee Plan if meets Environmentally Sensitive Criteria	Can only provide input to state & federal agencies with regards to wetland impact – can not approve or deny impacts
Protects rare habitats (i.e. cutthroat seep) Does not hold up development process as much as state Offers alternatives to filling wetlands Accounts for impacts to watersheds, not just wetlands	No Co. Dept. is tasked with wetland verifications Some changes to LDR’s and Comp Plan are still needed Numerous exemptions allow piece-meal taking of wetlands
N/A	
Strict wetland impact elimination criteria Protection of larger wetland systems	No upland buffer requirements

Appendix C (continued)

PROS	CONS
Avoidance & minimization is more restrictive through land use approvals Wetland impacts are viewed critically – no incentive for impacts Wetland buffers and conservation easements adjacent to all onsite wetlands	State agencies tend to be permitters and don't consider upland land use – conflict Compliance issues are demanding from a staffing perspective County is prompted(?) by state UMAM reqs.
Less workload No angry citizens – forwarded to the state	Single home owners might fill a wetland & the county can't do anything Natural beauty is diminished Habitat loss – lake degradation Sets a trend for neighbors to follow
Stricter than state & fed Requires majority of any mitigation to remain in Broward County State delegation streamlines the process for applicant	N/A

Question 7:

Response	Number of Counties
1 – Not at all likely	5
2	3
3 – Somewhat likely	1
4	1
5 – Very likely	0

Appendix D

UMAM Forms Used by Hillsborough County EPC

PART I – Qualitative Description (See Section 62-345.400, F.A.C.)

Site/Project Name		Application Number		Assessment Area Name or Number	
FLUCCs code		Further classification (optional)		Impact or Mitigation Site?	Assessment Area Size
Basin/Watershed Name/Number	Affected Waterbody (Class)		Special Classification (i.e. OFW, AP, other local/state/federal designation of importance)		
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands					
Assessment area description					
Significant nearby features			Uniqueness (considering the relative rarity in relation to the regional landscape.)		
Functions			Mitigation for previous permit/other historic use		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)			Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):					
Additional relevant factors:					
Assessment conducted by:			Assessment date(s):		

Form 62-345.900(1), F.A.C. [effective date 02-04-2004]

Appendix D (continued)

PART II – Quantification of Assessment Area (impact or mitigation) (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	Assessment conducted by:	Assessment date:

Scoring Guidance The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Optimal (10) Condition is optimal and fully supports wetland/surface water functions	Moderate (7) Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal (4) Minimal level of support of wetland/surface water functions	Not Present (0) Condition is insufficient to provide wetland/surface water functions
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.500(6)(a) Location and Landscape Support w/o pres or current <input type="checkbox"/> with <input type="checkbox"/>	
.500(6)(b) Water Environment (n/a for uplands) w/o pres or current <input type="checkbox"/> with <input type="checkbox"/>	
.500(6)(c) Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current <input type="checkbox"/> with <input type="checkbox"/>	

Score = sum of above scores/30 (if uplands, divide by 20)	
current	with
<input type="checkbox"/>	<input type="checkbox"/>
or w/o pres	

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

Appendix D (continued)

Mitigation Determination Formulas (See Section 62-345.600(3), F.A.C.)

For each impact assessment area:

(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable)/((t-factor)(risk))

If the acreage of mitigation proposed is known:

(FG) Functional Gain = Relative Functional Gain X Mitigation acres

(a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scored

Bank Assessment Areas	RFG	X	Acres	=	Credits
example					
a.a.1					
a.a.2					
total					

(b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assessed in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.

Impact Assessment Area	FL	=	Credits needed
example			
a.a.1			
a.a.2			
total			

(c) Mitigation needed to offset impacts, when not using a bank

To determine the acres of mitigation needed to offset impacts when not using a bank or a regional offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG).

example	FL	/	RFG	=	Acres of Mitigation
a.a.1	2.2		0.6		3.67

If there are multiple impact assessment areas and/or multiple mitigation assessment areas to offset those impacts, or if the proposed mitigation acreage is a given, then the summation of the appropriate functional gain (FG) must be equal to or greater than the summation of respective functional losses (FL)

example	FL	<	FG
impact a.a.1	1.1		
a.a.2	0.93		
a.a.3	4.5		
mitigation a.a.4			5.2
a.a.5			1.6
summation	6.53		6.8

Form 62-345.900(3) [effective date 09-12-2007]

Appendix E

Wetland Impact Permit File Review

The following tables represent my analysis of wetland impact permit review files with the Hillsborough County EPC Wetlands Management Division:

	File: Tampa Bay Regional Water Treatment Plant	File: Roadway Yellow Express Tampa Terminal Expansion
1. Date	1/10/08	7/19/07
2. Size of area	0.48 fill; 0.2 cleared	Temporary: 1.36 Permanent: 0.40
3. Characteristics of wetland/ quality & functions	Isolated wetlands; Palustrine, invasive exotics, components of wetland scrub and freshwater marshes; brushland, shrub/scrub, dominant vegetation: Brazilian pepper and Chinese tallow tree, isolated, low quality, minimal wildlife, primary function: water storage	Wetland connected to system that runs east and west of project; surrounded by development, frog, reptile birds, wild hog habitat, desirable wetland vegetation, limited adjacent habitats
4. Intended action/s	Expand capacity of plant from 66 mgd to 120 mgd impact through filling and clearing	Resurface existing pavement
5. Permit received?	Y - ~ \$4,900 fee for application	Y -
6. Mitigation required?	Y: 1.07 acres creation and 0.02 acres restoration – directly connected to impacted area	Y – 2.6 acres
7. Other comments	Modification of previous permit	

Appendix E (continued)

	File: Van Dyke Road Widening Project	File: Hidden Creek East
1. Date	5/12/08	3/07 – 10/07 (7 months)
2. Size of area	0.15 + 0.32	0.57 acres impacted
3. Characteristics of wetland/ quality & functions	Thermal regulation of stormwater, herbaceous fringe of cypress system, maintained ditch, wading bird foraging, amphibian breeding, forested wetland, low quality because ditch maintenance activity	Natural levee and floodplain forest on bank of Dug Creek – Dug Creek empties into Little Manatee River; receives some light industrial runoff, wildlife habitat: small mammals, fish, invertebrates, amphibians; threatened: Eastern indigo snake; desirable vegetation
4. Intended action	Widen road to reduce traffic congestion	Fill and asphalt, roadways within subdivision – road widening
5. Permit received?	Y	Y
6. Mitigation required?	Y – 1.6 acres cypress wetland creation area; functions: wading bird foraging and amphibian breeding; large mammal refuge, possible fish habitat \$188,252 cost	Y – 1.7 + 0.78 + 0.68
7. Other comments	0.30 functional loss, 0.37 functional gain = 0.06 functional lift	

Appendix E (continued)

	File: Whispering Woods Subdivision	File: Forest Glen Subdivision
1. Date	8/15/08	2/08-7/08
2. Size of area	Permanent: 0.04 + 0.05	0.072
3. Characteristics of wetland/ quality & functions	Edge of forested wetland (.04) and upland cut ditch (.05); functional loss: 0.014; wading birds, slash pine and laurel oak canopy	Forested creek, excavated pond, hardwood swamp, amphibian, birds, sm- med mammals, including End./Threat: snowy egret, little blue heron, white ibis, tri-colored heron
4. Intended action	Redesign roadway layout in single-family residential community project	Filling wetland for roadway and stormwater system construction associated with proposed subdivision development
5. Permit received?	Y	Y
6. Mitigation required?	Y – 0.25 acres upland preservation: functional gain 0.032	Y – 0.12: red maple, herbaceous marsh, functions: flood conveyance, wildlife habitat, water quality improvement, End./Threat habitat and other animals
7. Other comments		\$12,500 mitigation cost

Appendix E (continued)

	File: Plaza 301	File: Ravinia
1. Date	10/07	10/07
2. Size of area	Proposed 0.22, approved 0.12	0.08
3. Characteristics of wetland/ quality & functions	Excavated pond with trees; majority nuisance vegetation, laurel oak and red maple canopy with native fern understory, small mammals and wading birds	Cypress swamp and lake: laurel oak, cabbage palm, slash pine natural creek: invasive nuisance: elderberry, blackberry, Caesar weed – also hardwoods
4. Intended action	Building – commercial	Cross channelized creek for access to entire tract of a tributary to Rocky Creek
5. Permit received?	Y	Y
6. Mitigation required?	Y – creation 0.1 shallow herbaceous; enhancement 0.1 wetland hardwood forest	Y- 0.25 acres creation mixed hardwood wetlands contiguous to lake: habitat to birds, amphibians, snakes, small mammals
7. Other comments	\$11,220 mitigation cost	

	File: Emerald Bay Professional Park
1. Date	11/07
2. Size of area	0.25 herbaceous, 0.11 cypress swamp,
3. Characteristics of wetland/ quality & functions	Bahia grass, St. Augustine grass, pond cypress, laurel oak, Brazilian pepper, pine trees, Threatened bird species, amphibians, small-medium mammals
4. Intended action	Commercial/office space construction
5. Permit received?	Y
6. Mitigation required?	Y – 0.41 acres creation = \$21,700; functions: migrating birds habitat, flood attenuation, herbaceous roadside cut ditch: plant native vegetation – monitor/maintain for 5 years; also forested cypress area north of existing boardwalk
7. Other comments	